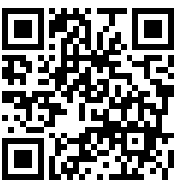

SAN JUAN-CHAMA RECLAMATION PROJECT
and
NAVAJO INDIAN IRRIGATION PROJECT

HEARING

BEFORE THE

SUBCOMMITTEE ON IRRIGATION AND RECLAMATION

OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

HOUSE OF REPRESENTATIVES

EIGHTY-SIXTH CONGRESS

SECOND SESSION

ON

H.R. 2352, H.R. 2494, and S. 72

BILLS TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO CONSTRUCT, OPERATE, AND MAINTAIN THE NAVAJO INDIAN IRRIGATION PROJECT AND THE INITIAL STAGE OF THE SAN JUAN-CHAMA PROJECT AS PARTICIPATING PROJECTS OF THE COLORADO RIVER STORAGE PROJECT, AND FOR OTHER PURPOSES

MAY 20, 1960

Serial No. 22

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SAN JUAN-CHAMA RECLAMATION PROJECT AND NAVAJO INDIAN IRRIGATION PROJECT

FRIDAY, MAY 20, 1960

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION OF THE
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C.

The subcommittee met at 9:45 a.m., room 1324, New House Office Building, Hon. Walter Rogers (chairman) presiding.

Mr. ROGERS. The Subcommittee on Irrigation and Reclamation will come to order for the consideration of pending business.

The pending business this morning is three measures; H.R. 2352 by our colleague, Mr. Morris of New Mexico; H.R. 2494 by our colleague, Mr. Montoya, of New Mexico; and we are also going to consider S. 72, a similar Senate bill.

These bills would authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project and for other purposes.

Before we hear the witnesses, I want to just make this observation, that the bills under consideration would authorize the construction of two projects. The Navajo project is an Indian irrigation project designed for irrigation of about 110,000 acres of land and for the sole use of the Navajo Indians. Its estimated cost is about $135 million.

The San Juan-Chama project is a reclamation project in New Mexico and the initial stage which this bill would authorize is estimated to cost about $86 million and furnish additional municipal and industrial water supplies for the city of Albuquerque.

Without objection, H.R. 2352 will be inserted in the record.

Reference will be made to the other measures to which I referred and the report of the Department of Interior under date of May 19, 1960, which just reached the committee will follow the insertion of H.R. 2352.

(H.R. 2352 and the report follow:)

[H.R. 2352, 86th Cong., 1st sess.]

A BILL To authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, 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 purposes of furnishing water for irrigation or irrigable and arable lands, municipal, domestic and industrial uses (and for other beneficial purposes), providing recreation and fish and wildlife benefits, controlling silt, the Congress hereby approves as participating projects of the Colorado River storage project the Navajo Indian irrigation project, New Mexico, and the San Juan-Chama project, Colorado-New Mexico.

Principal engineering works of the Navajo Indian irrigation project shall be a main gravity canal, tunnels, siphons, pumps, and powerplants for project purposes, laterals, drains, distribution systems and related works. The San Juan-Chama project facilities shall be comprised principally of regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works.

The Navajo Indian irrigation project and the San Juan-Chama project herein approved are substantially those described in the proposed coordinated report of the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, approved and adopted by the Secretary of the Interior on October 16, 1957.

SEC. 2. Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain the Navajo Indian irrigation project for the principal purpose of furnishing irrigation water to approximately one hundred and ten thousand six hundred and thirty acres of land, said project to have an average annual diversion of five hundred and eight thousand acre-feet of water, the repayment of the costs of construction thereof to be in accordance with the provisions of said Act of April 11, 1956 (70 Stat. 105), including, but not limited to, section 4 (d) thereof.

SEC. 3. (a) In order to provide for the most economical development of the Navajo Indian irrigation project, the Secretary of the Interior is hereby authorized and directed to declare by publication in the Federal Register that the United States of America holds in trust for the Navajo Tribe of Indians any legal subdivisions or unsurveyed tracts of federally owned land outside the present boundary of the Navajo Indian Reservation in New Mexico in townships 28 and 29 north, ranges 10 and 11 west, and townships 27 and 28 north, ranges 12 and 13 west, New Mexico principal meridian, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, *Provided, however*, That no such legal subdivision or unsurveyed tract shall be so declared to be held in trust by the United States for the Navajo Tribe until the Navajo Tribe shall have paid the United States the full appraised value thereof: *And provided further*, That in making appraisals of such lands the Secretary of the Interior shall consider their values as of the date of approval of this Act, excluding therefrom the value of minerals subject to leasing under the Act of February 25, 1920, as amended (30 U.S.C. 181–286), and such leasable minerals shall not be held in trust for the Navajo Tribe and shall continue to be subject to leasing under the Act of February 25, 1920, as amended, after the lands containing them have been declared to be held in trust by the United States for the Navajo Tribe.

(b) The Navajo Tribe is hereby authorized to convey to the United States, and the Secretary of the Interior is hereby directed to accept on behalf of the United States, title to any land or interest in land within the above-described townships, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, acquired in fee simple by the Navajo Tribe, and after such conveyance said land or interest in land shall be held in trust by the United States for the Navajo Tribe as a part of the Navajo Indian irrigation project.

(c) The Secretary of the Interior is hereby authorized and directed to acquire by purchase, exchange, or condemnation any other land or interest in land within the townships above described susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project. After such acquisition, said lands or interest in lands shall be held by the United States in trust for the Navajo Tribe of Indians and the price of such lands or interest in lands or of the land given in exchange therefor by the United States shall be charged to funds of the Navajo Tribe of Indians on deposit in the Treasury of the United States.

SEC. 4. In developing the Navajo Indian irrigation project, the Secretary is authorized to provide capacity for municipal and industrial water supplies or miscellaneous purposes over and above the diversion requirements for irrigation stated in section 2 of this Act. But such additional capacity shall not be constructed and no appropriation of funds for such construction shall be made unless, prior thereto, contracts have been executed which, in the judgment of the Secretary, provide satisfactory assurance of repayment of all costs properly allocated to the purposes aforesaid with interest as provided by law.

SEC. 5. Payment of operation and maintenance charges of the irrigation features of the Navajo Indian irrigation project shall be in accordance with the provisions of the Act of August 1, 1914 (38 Stat. 582, 583), as amended by the Act of August 7, 1946 (60 Stat. 867): *Provided*, That the Secretary of the Interior in his discretion may transfer to the Navajo Tribe of Indians the care, operation, and maintenance of all or any part of the Navajo Indian irrigation project works, subject to such rules and regulations as he may prescribe, and, in such event, the Secretary may transfer to the Navajo Tribe title to movable property necessary to the operation and maintenance of project works.

SEC. 6 (a) Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain an initial stage of the San Juan-Chama project, Colorado-New Mexico, for the principal purposes of furnishing water supplies to approximately thirty-nine thousand three hundred acres of land in Cerro, Taos, Llano, and Projoaque tributary irrigation units in the Rio Grande Basin, about eighty-one thousand six hundred acres of land in the existing Middle Rio Grande Conservancy District, and municipal, domestic, and industrial uses, and providing recreation and fish and wildlife benefits, said initial stage to have an average annual diversion of one hundred and ten thousand acre-feet of water. Principal engineering works of the initial stage development involving three major elements, shall include diversion dams and conduits, storage and regulation facilities at the Heron Numbered 4 Reservoir site and enlargement of outlet works of the existing El Vado Dam, and water use facilities consisting of reservoirs, dams, canals, lateral and drainage systems, and associated works and appurtenances. The construction of recreation facilities at the Nambe Reservoir shall be contingent upon the Secretary's making appropriate arrangements with the governing body of the Nambe Pueblo for the operation and maintenance of such facilities, and the construction of recreation facilities at the Heron Numbered 4, Valdez, and Indian Camp Reservoirs shall be contingent upon the Secretary's making appropriate arrangements with a State or local agency or organization for the operation and maintenance of those facilities: *Provided*, That—

(i) all works of the project, both in its initial stage and in its final development, shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact;

(ii) the amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year;

(iii) details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided*, That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this subsection shall be incorporated in a written report transmitted to the States of Colorado, Texas, and New Mexico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction.

(b) The Secretary of the Interior is hereby authorized to construct the tunnel and conduit works of the initial stage of the San Juan-Chama project with sufficient capacity for future diversion of an average of two hundred and thirty-five thousand acre-feet per annum, and to recognize the cost of providing such

additional capacity as a deferred obligation to be paid at such time as the additional capacity may be required.

SEC. 7. (a) No person shall have or be entitled to have the use for any purpose, including uses under the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project authorized by sections 2 and 6(a) of this Act, of water stored in Navajo Reservoir or of any other waters of the San Juan River and its tributaries originating above Navajo Reservoir to the use of which the United States is entitled, except under contract satisfactory to the Secretary of the Interior and conforming to the provisions of his Act. Such contracts, which, in the case of water for Indian uses, shall be executed with the Navajo Tribe, shall make provision, in any year in which the Secretary anticipates a shortage taking into account both the prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for a sharing of the available water in the following manner: The prospective runoff shall be apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each groups bears to the total of all normal diversion requirements. In the case of contractors diverting above Navajo Reserovir, each such contract shall provide for a sharing of the runoff apportioned to said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts that have been made hereunder: *Provided*, That for any year in which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of his diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to said group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the proportion that the normal diversion requirements of each bears to the total normal diversion requirements of the group. In the case of contractors diverting from or below Navajo Reservoir, each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts that have been made hereunder.

The Secretary shall not enter into contracts beyond a total amount of water that, in his judgment, in the event of shortage will result in a reasonable amount being available for the diversion requirements for the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as specified in sections 2 and 6(a) of this Act.

(b) In the event contracts are entered into for delivery from storage in Navajo Reservoir of water not covered by subsection (a) of this section, such contracts shall be subject to the same provision for sharing of available water supply in the event of shortage as in the case of contracts required to be made pursuant to subparagraph (a) of this section.

(c) This section shall not be applicable to the water requirements of the existing Fruitland, Hogback, Cudai, and Cambridge Indian irrigation projects, nor to the water required in connection with the extension of the irrigated acreages of the Fruitland and Hogback Indian irrigation projects in a total amount of approximately eleven thousand acres.

SEC. 8. Section 12 of the Act of April 11, 1956, 70 Stat. 105, shall not apply to the works authorized by this Act. There are hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated, such funds as may be required to carry out the purposes of this Act, but not to exceed $221,000,000 (January 1958 prices) plus such amounts, if any, as may be required by reason of changes in construction costs as indicated by engineering cost indexes applicable to the types of construction involved therein and, in addition thereto, such sums as may be required to operate and maintain the projects.

SEC. 9. The Act of April 11, 1956 (70 Stat. 105) is hereby amended as follows: (i) In section 1, subsection (2), after "Central Utah (initial phase)" delete the colon and insert in lieu thereof a comma; (ii) in section 5, subsection (e) in the phrase "herein or hereinafter authorized" delete the word "hereinafter" and insert in lieu thereof the word "hereafter"; (iii) in section 7 in the phase "and any contract lawfully entered unto under said Compacts and Acts" delete the word "unto" and insert in lieu thereof the word "into".

U.S. DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D.C., May 19, 1960.

HON. WAYNE N. ASPINALL,
Chairman, Committee on Interior and Insular Affairs,
House of Representatives, Washington, D.C.

DEAR MR. ASPINALL: This responds to your request for the views of this Department on H.R. 2352 and H.R. 2494, identical bills to authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, and for other purposes."

This Department recommends the enactment of either of these bills.

The bills would approve the proposed Navajo Indian irrigation project and the San Juan-Chama project as participating projects of the authorized Colorado River storage project and would authorize the construction of the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project. The coordinated planning report on the Navajo Indian irrigation project and the San Juan-Chama project that has been prepared jointly by the Commissioner of Indian Affairs and the Commissioner of Reclamation, and has been approved and adopted by this Department, has been cleared pursuant to the Flood Control Act of 1944 and the act of August 14, 1946. This planning report will be furnished to the committee at the time of the hearing on these bills.

There is attached to this report a copy of the letter from the Bureau of the Budget to this Department relating to these bills.

The proposed plan of development for the Navajo Indian irrigation project contemplates the construction of facilities to provide a water supply for the irrigation of lands to be developed solely for Indian use. The conservation and development of fish and wildlife would be a purpose of the project. The plan would not provide specific works for recreation or flood control benefits.

Prior to construction of the project, studies of incremental canal capacity would be made to determine the feasibility of conveying domestic and industrial water supplies for potential requirements as recommended in the proposed planning report. Officials of the State of New Mexico anticipate that a relatively large industrial water demand will develop in the San Juan River Basin. This would be accompanied by associated water requirements for municipal, domestic, and miscellaneous purposes in the adjacent areas. Prospective municipal and industrial water users have already expressed interest in receiving water from the proposed Navajo Canal and have approached the Department in that regard. Section 4 of the bills would authorize the provision of additional capacity for such purposes over and above the diversion requirements for irrigation on the Navajo Indian irrigation project.

Water for irrigation of the lands proposed to be included in the Navajo Indian irrigation project would be diverted from Navajo Reservoir which is now under construction as a storage unit of the Colorado River storage project. A main gravity canal would extend from Navajo Dam to Kutz Canyon. There the water would be dropped through a powerplant to develop electrical energy for pumping water to lands in the Newcomb and Bennett Peak areas of the project. The main canal would extend an additional 77 miles beyond the powerplant to serve project lands.

A net area of 110,630 acres of irrigable land has been proposed for development. The area would include off-reservation lands to be acquired in the South San Juan division and Navajo Indian Reservation lands in the Shiprock division. Section 3 of the bills would provide authority for the acquisition and addition of the off-reservation lands to the proposed project. The project's productive area, which would exclude farmsteads and other nonproductive areas within farm units, would comprise (*a*) 8,918 acres served by gravity below the main canal in the South San Juan division and 70,359 acres in the Shiprock division, and (*b*) 25,882 acres served from the pump canals in the Shiprock division, or a total of about 105,100 acres. An average annual diversion of about 508,000 acre-feet of water from San Juan River would be required for that purpose. This would result in an average annual stream depletion of about 252,000 acre-feet, exclusive of reservoir losses.

The estimated construction cost of the proposed Navajo Indian irrigation project is about $135 million at January 1959 prices. Operation, maintenance,

and replacement costs are estimated to average about $481,000 annually at January 1959 prices for both 50-year and 100-year periods of analysis. The benefit-cost ratio for the project would be 0.64 to 1 on the basis of direct irrigation benefits only, and 1.44 to 1 on the basis of total irrigation benefits. The appraisal of annual economic costs includes the $2 per acre-foot depletion charge of the storage project assigned to all participating projects for all benefit-cost ratio purposes.

As provided by sections 4(d) and 6 of the Colorado River Storage Project Act of April 11, 1956 (70 Stat. 105), authorizing the Colorado River storage project and participating projects, in the event that the Navajo participating project is authorized, payment of costs allocated to irrigation of Indian-owned, tribal, or restricted lands within, under, or served by such project within the capability of the land to repay is subject to the act of July 1, 1932 (47 Stat. 564); the costs beyond the capability of such lands to repay are to be determined and, in recognition of the fact that assistance to the Navajo Indians is the responsibility of the entire Nation, shall be nonreimbursable.

The proposed plan of development for the San Juan-Chama project is designed to improve and stabilize the economy of the water-deficient Rio Grande and Canadian River basins of New Mexico by providing supplemental water to meet rapidly increasing needs. This would be accomplished by diverting water from the upper tributaries of the San Juan River. The water would be used for supplemental irrigation, for replacement of watershed depletions in the Rio Grande Basin, and for an additional supply for municipal, domestic, and industrial purposes. Recreation and conservation and development of fish and wildlife would also be purposes of the project. On the basis of January 1959 prices, the estimated construction cost for the project facilities studied in the plan of development is about $149 million. The evaluated total annual benefits for such a development would exceed the estimated annual costs in a ratio of about 1.7 to 1.

The proposed plan for initial stage development of the San Juan-Chama project, as recommended by the State of New Mexico, contemplates an average annual diversion of about 110,000 acre-feet from the San Juan River for utilization in the Rio Grande in New Mexico. The imported waters would be used for an additional municipal and industrial water supply (57,300 acre-feet) for the city of Albuquerque; a supplemental irrigation water supply (30,100 acre-feet) to about 39,300 acres of land in the Cerro, Taos, Llano, and Pojoaque tributary irrigation units in the Rio Grande basin in New Mexico; and supplemental water (22,600 acre-feet) for irrigation of about 81,600 acres of irrigable land in the existing Middle Rio Grande Conservancy District. Recreation and conservation and development of fish and wildlife would also be purposes of the initial stage of development.

The proposed plan of development for the initial stage would involve three major elements, namely, diversion facilities (diversion dams and conduits), regulation facilities (Heron No. 4 dam and reservoir, and enlargement of outlet works of the existing El Vado Dam), and water use facilities (principally for the tributary irrigation units). Minimum basic recreation facilities would also be provided at the five project reservoirs.

The estimated construction cost of the project features of the proposed initial stage, on the basis of Janury 1959 prices, is about $86 million, which includes about $400,000 for minimum basic recreation facilities. Project operation, maintenance, and replacement costs are estimated at about $346,000 annually for a 50-year period and about $378,000 annually for a 100-year period. Of the estimated project construction costs, reimbursable allocations of about $29,200,000 have been made tentatively to municipal and industrial water supply, $53,400,000 to irrigation, and $3 million to future uses. The recreation costs would be nonreimbursable. The proposed initial stage development would have engineering feasibility and would be economically justified in that the evaluated total benefits would exceed the estimated annual costs in a ratio of 1.26 to 1 for a 100-year period of analysis. If direct benefits only are considered in a 50-year period of analysis, that ratio would be about 0.81 to 1.

Costs allocated to municipal and industrial water supply including interest during construction, would be repaid over a 50-year period with interest on the unamortized balance. The total to be paid by the municipal and industrial water users would be about $58,600,000. The cost of raw municipal and industrial water would be about 7.7 cents per 1,000 gallons, or about $25 per acre-foot.

This estimated municipal and industrial water rate would apply to water developed by initial stage construction. Repayment contract terms and water

rates under subsequent development would be subject to reexamination as plans develop and additional quantities of municipal and industrial water would be contracted. Where necessary, in the adequate financing of any subsequent development, water rates and repayment provisions could be designed to reflect any significant change in municipal and industrial use, operation, and maintenance costs associated therewith, and other relevant considerations.

Irrigation water users probably would repay about $8 million of the allocation to irrigation. Repayment contracts would be negotiated and entered into with organizations of the type provided in section 4 of the Colorado River Storage Project Act of April 11, 1956 (70 Stat. 105), for contracting on the participating projects authorized by section 1 of that act. The costs allocated to irrigation in excess of the irrigators' ability to repay would be paid from New Mexico's apportionment of the Upper Colorado River Basin fund revenues as provided in the act. Costs allocated to future uses, which would involve the provision of excess capacity in the initial stage to permit later project expansion would also be an obligation against New Mexico's share of the basin fund revenues, to be paid from that apportionment if not otherwise collected as a result of subsequent allocations to the water users.

Authorization of an irrigation development such as the proposed Navajo Indian irrigation project would implement the recognition given in the act of April 11, 1956, of the Nation's responsibility to help alleviate the severe economic distress among the Navajo people by providing them an opportunity to earn a respectable standard of living. It would enable an estimated 1,400 families to establish homes on irrigated farms. The proposed project has the support of the Navajo Indian Tribe, and it is our understanding that an on-the-farm training program, financed with tribal funds, has been undertaken already to prepare members of the tribe for irrigation farming.

A development such as that which is embraced in the initial stage of the proposed San Juan-Chama project might help materially to meet the pressing need for additional supplies of water in the Rio Grande Basin where the uses of water have been developed to the point where they far exceed available supplies. This need of the Rio Grande Basin vitally affects the welfare of more than half of the population of New Mexico and, if it is not satisfied in the near future, threatens to check the economic development of the State. Besides the requirements for irrigation, more water is needed to meet the domestic requirements of a growing urban population and of industry, particularly in the Albuquerque area.

The Bureau of the Budget has advised that there would be no objection to the submission of this report to your committee.

Sincerely yours,

ELMER F. BENNETT,
Acting Secretary of the Interior.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., May 19, 1960.

The Honorable the SECRETARY OF THE INTERIOR,

MY DEAR MR. SECRETARY: This is in reply to your letter of July 3, 1958, transmitting your coordinated report on the San Juan-Chama project in New Mexico and Colorado and the Navajo Indian irrigation project in New Mexico, both of which are proposed for authorization as units of the authorized Colorado River storage project. You request advice as to the relationship of the two projects to the program of the President.

The initial stage of the San Juan-Chama development, recommended for authorization in your report, would provide for a maximum annual diversion of 110,000 acre-feet of water from the Upper Colorado River Basin to the Rio Grande Basin to supply supplemental irrigation water for about 121,000 acres and additional municipal and industrial water for the Albuquerque metropolitan area. The principal features of the initial stage include three diversion dams, about 29 miles of conduit, and one storage dam and reservoir. The total estimated cost is $86 million, based on January 1958 prices, tentatively allocated as follows:

Municipal and industrial water	$29,200,000
Irrigation	53,400,000
Future use	3,000,000
Recreation	400,000
Total	86,000,000

All the costs allocated to municipal and industrial water supply would be repaid with interest within 50 years. About $8 million of the costs allocated to irrigation would be repaid by irrigation water users over a 50-year period and the balance would be repaid from New Mexico's share of surplus power revenues of the Colorado River storage project. The allocation to future use would also be repaid from these power revenues if it is not otherwise collected from water users. The benefit-cost ratio for the project, based on a 50-year period of analysis, is estimated at 1.03 using total benefits, and 0.81 using direct benefits only.

We note that about 57,000 acre-feet of water—over half of the total annual diversion—would be allocated to municipal and industrial water supply. In view of the rapid growth of population and the increasing emphasis on industrial development in the Rio Grande Basin of New Mexico, we believe this feature of the project would make an important contribution to the future development of the region.

Information in the report indicates that the Cerro, Taos, Llano, and Pojoaque tributary irrigation units are suffering increasing economic distress as the result of increasing population pressure, erratic water supplies, deterioration of existing irrigation works, and subdivision of ownership among heirs resulting in uneconomic farm units. Although the economic justification for undertaking these works at this time appears to be somewhat questionable, their inclusion in the overall recommended plan may be warranted because of the anticipated beneficial effects in sustaining the economies of these existing agricultural communities. We would recommend, however, that their inclusion on this basis be contingent upon the development of a joint Federal-State program to provide for the consolidation of farm developments into units large enough to provide reasonable family incomes.

We note that several of the concerned States have not furnished views on the project. We also understand that Colorado and New Mexico interests have been involved in negotiations over differences with respect to the proposed transfer of Colorado River Basin waters originating in Colorado for use outside the basin in New Mexico. We have been advised, however, that Colorado and New Mexico have recently reached agreement on the proposed transfer of waters.

The proposed Navajo Indian irrigation project would require the annual use of about 280,000 acre-feet of water of the San Juan River allocated to New Mexico under Colorado River compacts to irrigate about 110,000 acres within and adjacent to the Navajo Indian Reservation. These lands would be solely for Indian use. The principal features of the project include a main canal over 150 miles in length, pumping plants, a powerplant to provide project pumping energy, and associated works. The total cost, based on January 1958 prices, is estimated at $135,330,300 tentatively allocated entirely to irrigation. The benefit-cost ratio on the basis of a 50-year period of analysis is estimated at 1.3 using total benefits and 0.52 using direct benefits only.

We believe this proposal raises a number of important questions of public policy with respect to Federal water resources and Indian assistance programs.

In a dry area like New Mexico, availability of water is essential to continued economic growth. On the basis of present trends, demands for water for industrial and municipal use can be expected to increase substantially in future years. Notwithstanding this fact, this project would result in committing to agricultural uses a major part of the last source of unappropriated water in the State of New Mexico, the waters of the San Juan River allocated to the State under Coloroda River compacts. We recognize, however, that the project is primarily intended as an Indian assistance measure, and that other factors are involved in these circumstances.

The plan of development for the Navajo project indicates that eventually about 1,400 families would be operating irrigated farms. It is predicted that service industries in the project area would support 2,800 families and that, in total, sufficient employment opportunities would be provided to support 20,000 Indians. The construction period for the project, however, is estimated to be 14 years. Although construction could be accelerated, this period appears desirable to allow the integration of the irrigated land into the Indian economic base. Considering the normal lag between authorization and initiation of construction, it could be 16 to 20 years before the full benefits from the project become available if it were to be authorized this year.

Current population estimates on the Navajo Reservation range from 75,000 to 100,000. In view of the recent interest which has developed in industrial utilization of the large coal deposits on the Navajo Reservation, commitment of

a major portion of the waters of the San Juan River to agricultural purposes could impede industrial development on the reservation and the correspondingly greater employment opportunities which such development would provide. We would, therefore, question whether a Federal investment of $135 million is justified for a project which would ultimately establish not more than 25 percent of these people in an agricultural enterprise of marginal economic value.

Accordingly, subject to your consideration of the above views, the Bureau of the Budget would have no objection to the submission of your proposed report to the Congress. No commitment can be made, however, as to when any estimate of appropriation would be submitted for construction of these projects, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely yours,

ELMER B. STAATS, *Deputy Director.*

Mr. ASPINALL. Mr. Chairman?

Mr. ROGERS. Mr. Aspinall.

Mr. ASPINALL. Reserving the right to object—and I shall not object, of course—I do wish to have the record show for those people who are appearing here on behalf of this project—that the chairman of the full committee asked for a report on this legislation on March 21, 1959. Now we have a favorable report from the Department with an accompanying report from the Bureau of the Budget the day before the hearing.

We are glad to have these reports at this time because we hope to have a chance to read them this morning before we finish the presentation. However, we certainly will not have any chance to study the reports as far as what may be contained in them, but they should be useful for the hearings.

It makes it almost impossible for a committee of Congress to act intelligently upon a piece of legislation when reports are delayed so long. I wish that those people who are appearing here this morning on behalf of this legislation will understand that the presence of this report this morning does not change the statement that has gone out from the chairman of this committee that it would be impossible for us to bring this legislation before the House of Representatives in this Congress. As you know, we had a hearing yesterday on the Mid-State project and I am hopeful that we will finish our hearings this afternoon on this project inasmuch as we do get to meet this afternoon.

The hearings that we will have on Garrison and Fryingpan-Arkansas are hearings to bring us up to date, so that we will not have to spend additional time to study these various projects next Congress.

We are glad to have the reports, of course, but we are sorry that they were not delivered here some 5 or 6 months ago.

Thank you very much and I withdraw my reservation.

Mr. HOSMER. Reserving the right to object, the Senate bill which the chairman referred to contains an additional item not contained in H.R. 2352 and I ask that this be printed in the record as well so that we have that at this point in the record and also a report on one of the differences in these bills.

Mr. ROGERS. Without objection, the Chair thinks that perhaps the entire Senate bill should go in and also the report.

Without objection, S. 72 will be included in the record at this point if the gentleman will withdraw his reservation.

Mr. HOSMER. I withdraw my reservation.

Mr. ROGERS. Without objection, the other unanimous consent request will be granted.

(S. 72 follows:)

[S. 72, 86th Cong., 1st sess.]

AN ACT To authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, 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 purposes of furnishing water for irrigation or irrigable and arable lands, municipal, domestic and industrial uses (and for other beneficial purposes), providing recreation and fish and wildlife benefits, controlling silt, the Congress hereby approves as participating projects of the Colorado River storage project the Navajo Indian irrigation project, New Mexico, and the San Juan-Chama project, Colorado-New Mexico. Principal engineering works of the Navajo Indian irrigation project shall be a main gravity canal, tunnels, siphons, pumps, and powerplants for project purposes, laterals, drains, distribution systems and related works. The San Juan-Chama project facilities shall be comprised principally of regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works.

The Navajo Indian irrigation project and the San Juan-Chama project herein approved are substantially those described in the proposed coordinated report of the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, approved and adopted by the Secretary of the Interior on October 16, 1957.

SEC. 2. Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain the Navajo Indian irrigation project for the principal purpose of furnishing irrigation water to approximately one hundred and ten thousand six hundred and thirty acres of land, said project to have an average annual diversion of five hundred and eight thousand acre-feet of water, the repayment of the costs of construction thereof to be in accordance with the provisions of said Act of April 11, 1956 (70 Stat. 105), including, but not limited to, section 4(d) thereof.

SEC. 3. (a) In order to provide for the most economical development of the Navajo Indian irrigation project, the Secretary of the Interior is hereby authorized and directed to declare by publication in the Federal Register that the United States of America holds in trust for the Navajo Tribe of Indians any legal subdivisions or unsurveyed tracts of federally owned land outside the present boundary of the Navajo Indian Reservation in New Mexico in townships 28 and 29 north, ranges 10 and 11 west, and townships 27 and 28 north, ranges 12 and 13 west, New Mexico principal meridian susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the work or canals of such project: *Provided, however,* That no such legal subdivision or unsurveyed tract shall be so declared to be held in trust by the United States for the Navajo Tribe until the Navajo Tribe shall have paid the United States the full appraised value thereof: *And provided further,* That in making appraisals of such lands the Secretary of the Interior shall consider their values as of the date of approval of this Act, excluding therefrom the value of minerals subject to leasing under the Act of February 25, 1920, as amended (30 U.S.C. 181–286), and such leasable minerals shall not be held in trust for the Navajo Tribe and shall continue to be subject to leasing under the Act of February 25, 1920, as amended, after the lands containing them have been declared to be held in trust by the United States for the Navajo Tribe.

(b) The Navajo Tribe is hereby authorized to convey to the United States, and the Secretary of the Interior is hereby directed to accept on behalf of the United States, title to any land or interest in land within the above-described townships, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, acquired in fee simple by the Navajo Tribe, and after such conveyance said land or interest in land shall be held in trust by the United States for the Navajo Tribe as a part of the Navajo Indian irrigation project.

(c) The Secretary of the Interior is hereby authorized and directed to acquire by purchase, exchange, or condemnation any other land or interest in land within the townships above described susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project. After such acquisition, said lands or interest in lands shall be held by the United States in trust for the Navajo Tribe of Indians and the price of such lands or interest in lands or of the land given in exchange

therefor by the United States shall be charged to funds of the Navajo Tribe of Indians on deposit in the Treasury of the United States.

SEC. 4. In developing the Navajo Indian irrigation project, the Secretary is authorized to provide capacity for municipal and industrial water supplies or miscellaneous purposes over and above the diversion requirements for irrigation stated in section 2 of this Act. But such additional capacity shall not be constructed and no appropriation of funds for such construction shall be made unless, prior thereto, contracts have been executed which, in the judgment of the Secretary, provide satisfactory assurance of repayment of all costs properly allocated to the purposes aforesaid with interest as provided by law.

SEC. 5. Payment of operation and maintenance charges of the irrigation features of the Navajo Indian irrigation project shall be in accordance with the provisions of the Act of August 1, 1914 (38 Stat. 582, 583), as amended by the Act of August 7, 1946 (60 Stat. 867): *Provided*, That the Secretary of the Interior in his discretion may transfer to the Navajo Tribe of Indians the care, operation, and maintenance of all or any part of the Navajo Indian irrigation project works, subject to such rules and regulations as he may prescribe, and, in such event, the Secretary may transfer to the Navajo Tribe title to movable property necessary to the operation and maintenance of project works.

SEC. 6. (a) Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain an initial stage of the San Juan-Chama project, Colorado-New Mexico, for the principal purposes of furnishing water supplies to approximately thirty-nine thousand three hundred acres of land in Cerro, Taos, Llano, and Pojoaque tributary irrigation units in the Rio Grande Basin, about eighty-one thousand six hundred acres of land in the existing Middle Rio Grande Conservancy District, and municipal, domestic, and industrial uses, and providing recreation and fish and wildlife benefits, said initial stage to have an average annual diversion of one hundred and ten thousand acre-feet of water. Principal engineering works of the initial stage development involving three major elements, shall include diversion dams and conduits, storage and regulation facilities at the Heron Numbered 4 Reservoir site and enlargement of outlet works of the existing El Vado Dam, and water use facilities consisting of reservoirs, dams, canals, lateral and drainage systems, and associated works and appurtenances. The construction of recreation facilities at the Nambe Reservoir shall be contingent upon the Secretary's making appropriate arrangements with the governing body of the Nambe Pueblo for the operation and maintenance of such facilities, and the construction of recreation facilities at the Heron Numbered 4, Valdez, and Indian Camp Reservoirs shall be contingent upon the Secretary's making appropriate arrangements with a State or local agency or organization for the operation and maintenance of those facilities: *Provided*, That—

(i) all works of the project, both in its initial stage and in its final development, shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact;

(ii) the amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year;

(iii) details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided*, That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this subsection shall be incorporated in a written report transmitted to the States of Calorado, Texas, and New Mex-

ico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction.

(b) The Secretary of the Interior is hereby authorized to construct the tunnel and conduit works of the initial stage of the San Juan-Chama project with sufficient capacity for future diversion of an average of two hundred and thirty-five thousand acre-feet per annum, and to recognize the cost of providing such additional capacity as a deferred obligation to be paid at such time as the additional capacity may be required.

SEC. 7. (a) No person shall have or be entitled to have the use for any purpose, including uses under the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project authorized by sections 2 and 6(a) of this Act, of water stored in Navajo Reservoir or of any other waters of the San Juan River and its tributaries originating above Navajo Reservoir to the use of which the United States is entitled, except under contract satisfactory to the Secretary of the Interior and conforming to the provisions of this Act. Such contracts, which, in the case of water for Indian uses, shall be executed with the Navajo Tribe, shall make provision, in any year in which the Secretary anticipates a shortage taking into account both the prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for a sharing of the available water in the following manner: The prospective runoff shall be apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each group bears to the total of all normal diversion requirements. In the case of contractors diverting above Navajo Reservoir, each such contract shall provide for a sharing of the runoff apportioned to said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts that have been made hereunder: *Provided*, That for any year in which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of this diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to said group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the proportion that the normal diversion requirements of each bears to the total normal diversion requirements of the group. In the case of contractors diverting from or below Navajo Reservoir, each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts that have been made hereunder.

The Secretary shall not enter into contracts beyond a total amount of water that, in his judgment, in the event of shortage will result in a reasonable amount being available for the diversion requirements for the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as specified in sections 2 and 6(a) of this Act.

(b) In the event contracts are entered into for delivery from storage in Navajo Reservoir of water not covered by subsection (a) of this section, such contracts shall be subject to the same provision for sharing of available water supply in the event of shortage as in the case of contracts required to be made pursuant to subparagraph (a) of this section.

(c) This section shall not be applicable to the water requirements of the existing Fruitland, Hogback, Cudai, and Cambridge Indian irrigation projects, nor to the water required in connection with the extension of the irrigated acreages of the Fruitland and Hogback Indian irrigation projects in a total amount of approximately eleven thousand acres.

SEC. 8. Section 12 of the Act of April 11, 1956, 70 Stat. 105, shall not apply to the works authorized by this Act. There are hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated, such funds as may be required to carry out the purposes of this Act, but not to exceed $221,000,000, (January 1958 prices) plus such amounts, if any, as may be required by reason of changes in construction costs as indicated by engineering cost indexes applicable to the types of construction involved therein and, in addition thereto, such sums as may be required to operate and maintain the projects.

SEC. 9. The Act of April 11, 1956 (70 Stat. 105) is hereby amended as follows: (i) In section 1, subsection (2), after "Central Utah (initial phase)" delete the colon and insert in lieu thereof a comma; (ii) in section 5, subsection (e) in the phrase "herein or hereinafter authorized" delete the word "hereinafter"

and insert in lieu thereof the word "hereafter"; (iii) in section 7 in the phrase "and any contract lawfully entered unto under said Compacts and Acts" delete the word "unto" and insert in lieu thereof the word "into".

SEC. 10. The diversion of water for either or both of the projects authorized in this Act shall in no way impair or diminish the obligation of the "States of the Upper Division" as provided in article III(d) of the Colorado River Compact "not (to) cause the flow of the river at Lee Ferry to be depleted below an aggregate of seventy-five million 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".

Passed the Senate May 19, 1959.

Attest: FELTON M. JOHNSTON, *Secretary.*

Mr. ROGERS. Let the record show that the report referred to by the chairman includes also the report from the Bureau of the Budget which will be included immediately following the report of the Department of Interior.

The witnesses scheduled this morning are the authors of the bills first.

Without objection, Mr. Montoya's statement will be included in the record at this point.

He has been called away momentarily.

Mr. MCCONNELL. Mr. Chairman, Mr. Montoya is in an Appropriations Committee meeting this morning and he would like to present his statement personally when he returns.

Mr. ROGERS. The chairman is going to say that his statement is included at this point in the record and he may come in at any time later.

Mr. MCCONNELL. Thank you.

(The statement referred to follows:)

STATEMENT OF CONGRESSMAN JOSEPH M. MONTOYA OF NEW MEXICO

Mr. Chairman and members of the committee, I appear today on behalf of H.R. 2494 which I introduced: H.R. 2352 which was introduced by my colleague, Congressman Morris, of New Mexico; and S. 72, introduced in the Senate by Senator Clinton P. Anderson, of New Mexico. These bills all have as their purpose the authorization of the Navajo Indian irrigation project and the initial stage of the San Juan-Chama diversion, both of which are New Mexico participating projects of the Colorado River storage project now under construction.

I greatly appreciate the opportunity of appearing before this committee in support of both of the above projects, and I cannot emphasize too strongly the importance of their authorization and construction to the people of my State. First, I should like to say a few words relating to the construction of the initial stage of the San Juan-Chama project. This initial stage will divert annually approximately 110,000 acre-feet from the San Juan River Basin into the Rio Grande. This will provide needed supplemental water for existing irrigation projects and for municipal and industrial uses in the Albuquerque area, the largest metropolitan center in New Mexico.

There are many important defense installations located in the Albuquerque area, and there is a steadily growing need for water for new industrial and municipal uses. New programs and new projects are expanding within the area, and the waters presently available will soon be insufficient to meet the demand. In addition, water needed for irrigation purposes is now a major problem along the Rio Grande. The San Juan-Chama project will provide needed relief and will go a long way toward solving these problems.

The Navajo irrigation project will be located in northwestern New Mexico and will furnish water for the irrigation of approximately 110,000 acres of Indian land. This irrigation project will support over 20,000 people through employment on the project and through farming of their own tracts of land. It will not provide just a temporary alleviation of the economic problems with

which the Indian people within this area are faced, but rather a permanent solution for the economic betterment of the Indian people. With irrigation water available the Indian people will have an opportunity to grow crops, fruits, vegetables, and livestock feeds, and they can become economically independent. This alone would appear to justify the construction of the project, for the governmental agencies will no longer be called upon for the subsidy payments which are presently needed within the area.

Further, it should be noted that the Navajo Indians have long suffered hardships and depression, and their courage to withstand frustration should be recognized at the earliest opportunity. This opportunity exists now. The project can go a long way toward making the Navajo people self-sustaining and provide them with the self-respect engendered through productivity brought about through their own toil and work on their own farms.

Both of these projects have been found to be economically feasible after exhaustive studies by the Department of the Interior, and I strongly believe that their construction is justified. I cannot emphasize too greatly the need for these projects, and it is with my most sincere endorsement that I appear before this committee today and urge that a favorable report be agreed upon by the committee at the earliest practicable date.

I do want to add that I am greatly pleased to see that my State has reached agreement with the State of Colorado on the proposed amendments to the bills which were introduced. It is my understanding that with these amendments the State of Colorado no longer interposes any objection to the authorization of these projects, and I sincerely appreciate the cooperative efforts that Colorado has made toward assisting our people. I am certain that with this cooperative spirit both States can look forward to a growing spirit of friendliness and assistance in the development of our respective economic interests.

Again, I want to express my sincere appreciation to the members of this committee for the opportunity of appearing before you today and for the scheduling of hearings on this vital legislation. Thank you very much.

Mr. ROGERS. The Chair will now recognize the Honorable Thomas G. Morris, the author of H.R. 2352.

STATEMENT OF HON. THOMAS G. MORRIS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW MEXICO

Mr. MORRIS. Mr. Chairman, first I would like personally to thank you and the chairman of the Subcommittee on Irrigation and Reclamation for your consideration in holding these hearings. We have been wanting to have a hearing on this legislation for some time and have had a lot of difficulty in receiving these reports. If I might say personally, they certainly have taken their time about it.

Mr. Chairman and members of the committee, I am very happy we have so many fine people from New Mexico and other States here this morning who are interested in this legislation. I am not going to bore the committee with a long sales talk on this legislation because I know what you are interested in hearing is some of the technical aspects of the bill and also how it is going to be paid for. The details will be given by departments and by the State officials who are here to be heard by this committee.

I would like to ask unanimous consent that my statement be printed in the record in full at this point along with the section-by-section analysis of the bill which I have prepared.

Mr. ROGERS. Is there objection?

(No response.)

The Chair hears none and the request is granted.

(The statement referred to follows:)

STATEMENT OF CONGRESSMAN THOMAS G. MORRIS OF NEW MEXICO

Mr. Chairman and members of the committee, I appreciate this opportunity to apear before you in support of my bill, H.R. 2352.

The purpose of my legislation is to authoribe the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial phase of the San Juan-Chama project as participating projects of the Colorado River storage project. This measure provides for the continuation of the development of New Mexico's portion of the water resources of the upper Colorado River as contemplated in the act of April 11, 1956, which authorized the initial phase of the basinwide development. Passage of this bill will secure the efficient and equitable utilization of the limited water supplies available to the State of New Mexico, so that there will be no loss or wastage of the potential economic development which can accrue from the use of this valuable resource.

The committee will hear witnesses from the Bureau of Reclamation, the Bureau of Indian Affairs, and the Department of the Interior, who will furnish the technical details concerning their projects, so I intend at this time only to explain briefly the background for and the expected benefits from the bill. My analysis of the bill, section by section, is also furnished for the use of the committee and for inclusion in the record of the hearing.

The only major unused water resource remaining in the State of New Mexico is in the San Juan River, a tributary of the Colorado, which drains the northwest corner of the State. The average annual flow at the mouth of the San Juan is about 2½ million acre-feet, of which over a million acre-feet can be captured and stored in the Navajo Reservoir, a storage unit of the Colorado River storage project now under construction.

Under the upper Colorado River Basin compact, New Mexico is allocated the consumptive use of 11.25 percent of the water available for use in the Colorado River Basin after an allocation of 50,000 acre-feet of upper basin water to Arizona.

New Mexico's allocation would thus be 838,000 acre-feet of water annually (11.25 percent×7,500,000—50,000). (The 7.5 million is the amount of water, in acre-feet, apportioned to the upper basin by the 1922 Colorado River compact and the 50,000 acre-feet is apportioned to Arizona out of the upper basin's water.)

Annual depletion by existing developments in the upper basin in New Mexico amounts to 92,300 acre-feet. The Hammond project, the only participating project in New Mexico authorized in the original Colorado River Storage Project Act, will have a consumptive use of 6,800 acre-feet.

Certain authorized extensions of existing Indian irrigation projects will require 24,700 acre-feet. New Mexico's share of the evaporation losses from the storage units of the Colorado River storage project is estimated at 73,300 acre-feet (11.25 percent of 652,000 acre-feet, which is the estimated average annual depletion due to evaporation from the Glen Canyon, Flaming Gorge, and Curecanti units). New Mexico will bear all of the evaporation losses from the Navajo storage unit, which primarily benefits New Mexico. This is estimated at 39,000 acre-feet. All of these commitments for use of New Mexico's share of the water add up to 237,500 acre-feet annually, leaving about 600,000 acre-feet still to be developed.

The Navajo Indian project which would be authorized by my bill is expected to result in average annual depletions of 252,300 acre-feet. The proposed San Juan-Chama diversion of 110,000 acre-feet will deplete Colorado River flows by that amount, since it is a diversion out of the basin. The total for the two projects covered by this legislation, 362,300 acre-feet, is well within the 600,000 acre-foot balance of New Mexico's share of Colorado River water under the compacts, and clearly form an essential part of a soundly conceived plan to make the best possible use of the water resources of New Mexico. And, conversely, if we don't develop these two major projects in substantially the form proposed by this bill, it is doubtful that New Mexico would ever be able to use its full apportionment of Colorado River water.

The taxpayers of the Nation have long had to provide large sums in support of the Navajo Indians as wards of the Government. The Navajo irrigation project is one of the best steps we can take in getting these people on the track toward self-development and self-support. Not only will this project develop the agricultural potential of the Navajo Indian Reservations but it also will help to make possible the development of the vast mineral resources of the

Navajo lands, such as uranium, coal, gas, and oil. Water is the one essential to that development which they do not now possess.

Instead of spending between $20 and $25 million a year to carry on the Navajo relief programs, it seems only sound commonsense to construct this project, which is a first step toward reducing this annual burden on the taxpayers.

The other half of the authorization is for the purpose of improving the economy of the Rio Grande Valley, in the central part of the State. Diversion will be made from the high mountain tributaries of the San Juan River in Colorado, into the headwaters of the tributaries of the Chama, which flows into the Rio Grande near Espanola.

This new water will have a very substantial beneficial effect on the economy of the entire Rio Grande Valley in New Mexico. The Bureau of Reclamation estimates direct irrigation benefits at $1,418,000 annually and total irrigation benefits at $2,258,000 annually. This represents additional net income to the agricultural and related industries in the State of New Mexico. The Bureau estimates the benefits of the municipal and industrial water supplies at $1,426,000 annually, which is the cost of the cheapest alternative water supply. This is certainly a minimum measure of the value of the new water supply to the State. The benefits from both the municipal and irrigation water supplies will certainly far exceed the Bureau's statistical measures, since there is no adequate way of measuring the value of preventing the confusion, the shock of enforced adjustment, and the resultant losses to the economy of the State that will certainly take place if new water supplies are not developed.

The Federal Government also has a very great interest in the San Juan-Chama diversion since a large part of the tremendous growth in New Mexico is being brought about by such Federal installations as those of the Atomic Energy Commission at Los Alamos and Sandia, and of the Air Force at Kirtland Air Force Base at Albuquerque. New water supplies are essential for the continued growth of these installations.

In the interest of conserving the committee's time, I will conclude the oral portion of my statement now and submit my more detailed analysis for the record.

SECTION-BY-SECTION ANALYSIS IN SUPPORT OF H.R. 2352

Section 1

Approves the Navajo Indian irrigation project in New Mexico and the San Juan-Chama project in Colorado and New Mexico as participating projects of the Colorado River storage project, as described in the proposed coordinated report of the Bureau of Reclamation and the Bureau of Indian Affairs which was approved and adopted by the Secretary of the Interior on October 16, 1957.

The Colorado River storage project was authorized by the act of April 11, 1956 (43 U.S.C. 620). The Navajo and San Juan-Chama projects were considered by Congress for inclusion in that act, but because the reports had not been completed and reviewed by the States under the provisions of section 1 of the Flood Control Act of 1944, they were not authorized in the 1956 authorization. However, in section 2 of that authorization, the Secretary of the Interior was required to give priority to the completion of the reports on these two projects, among others, and certain requirements to be followed in planning the San Juan-Chama project were set forth. Only one off-stream dam and reservoir on tributary of the Chama was to be permitted, to be used solely for control and regulation of water, with no power facilities, and the reservoir was to be operated in strict compliance with the Rio Grande compact. All of these requirements are met in the project proposed for authorization by H.R. 2352.

Section 6 of the Colorado River storage project act established conditions to be followed in the event of authorization of the Navajo Indian participating project. Thus it appears evident that the Congress, in authorizing the Colorado River storage project, expected that these two projects would eventually be added as participating projects, and certainly the support of the State of New Mexico for the Colorado River storage project was based upon the expectation that they would become participating projects.

Section 2

Authorizes the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project to serve about 110,630 acres of land, with an average annual diversion of 580,000 acre-feet, and with repayment of the costs of construction to be in accordance with the provisions of the Colorado River Storage Project Act of April 11, 1956 (43 U.S.C. 620), including, but not

limited to, section 4(d) thereof, which calls for repayment of the costs of serving Indian lands to be subject to the act of July 1, 1932 (25 U.S.C. 386a).

Under section 6 of the April 11, 1956, act, construction costs attributable to irrigation of Indian-owned lands that exced the repayment capability of such lands will be nonreimbursable "in recognition of the fact that assistance to the Navajo Indians is the responsibility of the entire Nation."

Under section 4(d) repayment of costs within the repayment capability of the Indian lands is deferred as long as the land remains in Indian ownership, in accordance with the act of July 1, 1932, usually referred to as the Leavitt Act, which is applicable to all Indian lands on Federal reclamation projects. Accordingly, no part of the costs of the Navajo Indian irrigation project will be charged against the revenues of the upper Colorado River fund, but will be borne by the general taxpayer as assistance to the Navajo Indian Tribe, as are other expenditures for the relief of and assistance to Indians. If and when title to any Indian lands pass into non-Indian ownership, the portion of the construction costs within the repayment capability of the lands will be repayable by the irrigators, in the same manner as similar costs on any other non-Indian lands under the Colorado River storage project, or other Federal reclamation project. The Indian lands will pay operation and maintenance costs as provided in section 5.

The Navajo Indian irrigation project will provide a total of about 1,100 irrigated farms for the Indians. Another 2,200 families would be able to find employment in service and related activities resulting from the irrigation project. Thus the project will provide support for a total of about 18,000 Navajos in farming and related industries as well as for about 2,000 non-Indians. This project is one of the few opportunities which exist for relatively large-scale economic rehabilitation of the Navajo Tribe, which is the largest tribe of Indians in the country. The project will greatly reduce the pressure on the Navajo Indian Reservation and should result in very substantial decreases in the amount of Federal and State funds expended each year in direct relief for members of the Navajo Tribe.

Section 3

Subsection (a) authorizes the Secretary of the Interior to hold public lands, within the project area but outside the Navajo Indian Reservation, in trust for the Navajo Tribe for inclusion in the project, reserving the minerals subject to leasing under the mineral leasing laws. However, the Indians are required to pay the United States the full appraised value of such lands.

Subsection (b) authorizes the Navajo Tribe to convey lands owned by the tribe and required for the project to the United States to be held in trust for the tribe as a part of the Navajo Indian irrigation project.

Subsection (c) authorizes the Secretary of the Interior to acquire any other lands required for the project, to charge the tribe for the costs thereof, and to hold the lands in trust for the Navajo Tribe.

These provisions are needed to permit all of the lands in public or Indian ownership and necessary for the project to be assembled into one tract that can be economically served by the proposed project.

Section 4

Authorizes the Secretary to include additional capacity in the Navajo project works for municipal and industrial water supplies or miscellaneous purposes, subject to the requirement that a repayment contract assuring repayment with interest as provided by law be executed prior to the appropriation of funds for construction.

This section is included to permit municipal and industrial water supplies in northwestern New Mexico to be met in order to encourage economic diversification by attracting new industries to the area. Such supplies can be provided most economically through a slight increase in the size of the main diversion canal for the Navajo project.

As an example of the type of service contemplated under this section, the Navajo Tribe has entered into a lease contract with Utah Construction Co. for the mining of coal on the Navajo Reservation to produce steam-electric power. It is estimated that the production of power will ultimately require a diversion of 55,000 acre-feet of water a year, and allied industries, which it is hoped will be attracted to the reservation by this power, may require substantial additional amounts of water.

In addition, the town of Gallup, N. Mex., has expressed an interest in contracting for water from Navajo Dam. The supply for Gallup would need to be con-

veyed by means of the Navajo Canal about 75 miles from the dam to a point where it could be diverted into a storage reservoir from which a 55-mile pipeline would deliver it to the town of Gallup. Gallup has a population of 12,500, which is expected to double by 1970 to 1975. It is the trading center for a very substantially greater population, as it is the only town of any size for many miles around. The town is presently supplied with water from pumped wells, but this supply is inadequate to take care of anticipated future growth. The town is negotiating with the Secretary of the Interior for an annual allocation of 15,000 acre-feet of water, which could be provided in connection with the Navajo Indian project under the terms of section 4. This section also is consistent with the provisions of the Water Supply Act of 1958.

Section 5

Provides for operation and maintenance charges of the Navajo project to be paid in accordance with general laws applicable to Indian irrigation projects (25 U.S.C. 385). Operation and maintenance may be transferred to the Navajo Tribe at the discretion of the Secretary, subject to such rules and regulations as he may prescribe.

Section 6

Subsection (a) authorizes the Secretary to construct, operate, and maintain the initial stage of the San Juan-Chama project, Colorado-New Mexico, to furnish supplemental water supplies for irrigation of about 120,900 acres of land in the Rio Grande Basin, and for municipal, domestic, and industrial uses, and to provide recreation and fish and wildlife benefits. The project would have an average annual diversion of 110,000 acre-feet of water from the headwaters of the San Juan River into the Rio Grande Basin. The lands which would receive supplemental water supplies as a result of the diversion consist of 39,300 acres in the Cerro, Taos, Llano, and Pojoaque units and about 81,600 acres in the existing Middle Rio Grande Conservancy District.

Safeguards are included in this section to require compliance with the terms of the Rio Grande compact, to limit diversion in the Rio Grande Basin for users served by the San Juan-Chama project to the amounts available for such users from importation to and storage in the Rio Grande Basin, and to require development of details of project operation jointly with other agencies of the States of New Mexico and Texas and the Federal Government. Provision is made for a system of gages for securing hydrologic data to form the basis of the operation plan, and a report is required to be made and submited to the affected States as provided in the Flood Control Act of 1944 prior to any appropriation for project construction.

The 110,000 acre-feet of water imported into the Rio Grande would be divided, 57,000 acre-feet for an additional municipal and industrial water supply for the city of Albuquerque, and 53,000 acre-feet for supplemental irrigation water supplies, of which 30,000 acre-feet will be used by exchange on the four smaller tributary areas mentioned, and the balance of 23,000 acre-feet will augment the supply of the Middle Rio Grande Conservation District.

Subsection (b) of section 6 authorizes the Secretary to include sufficient capacity in the diversion works for the future diversion of an average of 235,000 acre-feet per annum, repayment of the costs of such additional capacity to be deferred until the adidtional capacity is required.

Section 7

Provides that any use of stored water in the Navajo Reservoir or other waters of the San Juan River above the Navajo Reservoir, to the use of which the United States is entitled, shall be under a contract satisfactory to the Secretary of the Interior which makes provision for sharing shortages and apportioning available water in years of low runoff in accordance with a rather complicated formula which has been worked out and agreed to by the State of New Mexico, the Navajo Tribe, and the engineers of the Department of the Interior. The Secretary would be prevented from contracting for so much water that either the Navajo or San Juan-Chama project would have less than a reasonable amount available for diversion in a year of water shortage. Four existing Indian irrigation projects, and contemplated extensions to two of them, are excluded from the requirement for sharing shortages since they have prior established water rights held for them by the United States.

Section 8

Authorizes the appropriation of not to exceed $221 million, not under the previous authorization for appropriations for the Colorado River storage project and participating projects, plus amounts required by reason of increase in construction cost levels after January 1958, and for operation and maintenance of the projects.

The estimated cost of the Navajo Indian irrigation project is $135 million. The repayment capability of the land is roughly estimated at $21 million. Repayment of this amount would be deferred until the lands come into the ownership of non-Indians, at which time the amount would be reimbursable. The remaining costs would be nonreimbursable as a national contribution toward the rehabilitation of the Navajos.

The estimated cost of the works of the San Juan-Chama project which would be authorized by H.R. 2352 is $86 million, which is tentatively allocated by the Bureau of Reclamation as follows:

Irrigation	$53,400,000
Municipal and industrial water	29,200,000
Future uses	3,000,000
Recreation	400,000
Total	86,000,000

Irrigation water users will repay $8 million, according to the Bureau, and the balance of $45,400,000 allocated to irrigation will be repaid from New Mexico's share of the revenues of the Upper Colorado River Basin fund, as contemplated in section 5(e) of the act of April 11, 1956. Costs allocated to municipal and industrial water supply will be repaid by the beneficiaries thereof in full, with interest. Costs of facilities required for future uses will be repaid by the future beneficiaries, but even if such uses do not materialize these costs could be repaid from New Mexico's share of Upper Colorado River Basin fund revenues. Only the $400,000 for recreational facilities, less than one-half of 1 percent of the cost of this project, is proposed by the Bureau of Reclamation to be nonreimbursable.

Section 9

Corrects three typographical errors in the original act authorizing the Colorado River storage project and participating projects.

Mr. MORRIS. Mr. Chairman, I would also like to make another unanimous-consent request, and that is that the record be held open for the filing of additional statements for 10 days after the conclusion of these hearings.

Mr. ROGERS. Is there objection?

Mr. ASPINALL. Reserving the right to object, these statements should be passed on or approved by the chairman of the subcommittee and the ranking minority member.

Mr. MORRIS. Yes, sir. I would make that provision in my unanimous-consent request.

Mr. ROGERS. Is there objection?

(No response.)

Mr. ROGERS. The Chair hears none and the request is granted.

Mr. MORRIS. Mr. Chairman, I will not take any more of the committee's time to talk about the legislation because I know I will have plenty of time to talk with you about it later.

Since I have asked that my statement be printed in the record, perhaps we can proceed with the hearings.

Mr. ROGERS. The Chair thanks the gentleman from New Mexico and makes the observation at this time that the committee is thoroughly familiar with the great amount of work he has done on these two projects. We will certainly be glad to hear from him at any time he has any further information to give to the subcommittee.

The next witness is from the Department of Interior, Mr. Floyd E. Dominy, Commissioner of Reclamation, Department of the Interior.

Is he here?

Mr. PALMER. Mr. Dominy will be unable to attend this morning and asked that I represent him.

Mr. ROGERS. Fine; we are glad to see you, Mr. Palmer.

You are accompanied by Mr. Don Burnett and Mr. Ralph Charles?

Mr. PALMER. That is right.

Mr. ROGERS. If you will identify them and give their titles for the record, you may proceed.

STATEMENT OF WILLIAM I. PALMER, ASSISTANT COMMISSIONER OF RECLAMATION, DEPARTMENT OF THE INTERIOR; ACCOMPANIED BY DON BURNETT, CHIEF, PROJECT DEVELOPMENT DIVISION; AND RALPH CHARLES, CHIEF, PROJECT DEVELOPMENT DIVISION, ALBUQUERQUE PROJECT OFFICE, ALBUQUERQUE, N. MEX.

Mr. PALMER. On my right is Mr. Don Burnett who is the Chief of the Project Development Division of the Bureau of Reclamation.

Next on my right is Mr. Ralph Charles who is the Chief of the Project Development Division, Albuquerque project office, Albuquerque, N. Mex.

The Commissioner asked that I express his regrets at his inability to attend this morning but he was otherwise committed. He asked also that I express to the committee his appreciation for the opportunity to appear in support of the San Juan-Chama and Navajo Indian irrigation projects.

I have his proposed statement. I would like to read it for the record and in one or two instances I will make slight changes in the statement over the way you have it, but when I reach those points, I will identify the changes and explain the reasons for them.

Mr. ROGERS. You may proceed.

Mr. PALMER. We appreciate the opportunity of presenting information on the plan of development for the proposed San Juan-Chama project in Colorado and New Mexico. The proposed Navajo Indian irrigation project, which is covered in the bills now before the committee, is not included in this statement, but will be discussed by others. The San Juan-Chama project is one of the potential participating projects which are given priority to completion of planning reports as provided by section 2 of the Colorado River Storage Project Act of April 11, 1956 (70 Stat. 105).

The bills H.R. 2352 and H.R. 2494 being considered by your committee would, among other things, approve this proposed water resource development as a participating project of the Colorado River storage project. The bills would also authorize construction of an initial stage development of that proposed participating project.

The Bureau of Reclamation's plan of development for the San Juan-Chama project was coordinated with the plan of the Bureau of Indian Affairs for development of the Navajo Indian irrigation project. Our coordinated planning reports were based on criteria and recommendations for development of the projects as submitted by the State of New Mexico. The Secretary's proposed report on

the two projects was coordinated with the affected States and interested Federal agencies as required by law and interagency agreement.

Departing from the statement, when we get to an appropriate point, I want Mr. Charles to step to the map and identify some of the plan of development which will aid in an understanding of the proposal.

Ultimate development: Development of the proposed San Juan-Chama project could be accomplished under the comprehensive plan by diverting an average of 235,000 acre-feet of water annually from the upper tributaries of the San Juan River to the water-deficit Rio Grande and Canadian Basins. The water would be used to supplement irrigation of about 224,000 acres of arable land in the project area and as an additional supply for municipal and industrial purposes. Recreation and the preservation and propagation of fish and wildlife would also be purposes of the project.

On the basis of January 1958 prices, which are still applicable today, the estimated construction cost for project facilities studied in the ultimate plan of development, comprising principally regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works, is about $149 million.

The evaluated total annual benefits exceed the estimated annual costs in a ratio of about 1.7 to 1.

Initial stage of development: The plan for initial stage development of the San Juan-Chama project contemplates an average annual diversion of about 110,000 acre-feet from the San Juan River for utilization in the Rio Grande Basin in New Mexico. The imported waters would be used to provide a supplemental irrigation water supply to 39,300 acres of land in the Cerro, Taos, Llano, and Pojoaque tributary irrigation units in the Rio Grande Basin in New Mexico; to provide supplemental water supply for irrigation of 81,600 acres of irrigable land in the existing Middle Rio Grande Conservancy District; and to provide for an additional municipal and industrial water supply for the city of Albuquerque. Recreation and the preservation and propagation of fish and wildlife would also be purposes of the initial stage.

The estimated construction cost of the project features of the initial stage, on the basis of January 1958 prices that also reflect current prices, is about $86 million, which includes $400,000 for minimum basic recreation facilities. Project operation, maintenance, and replacement costs are estimated at about $324,000 annually excluding recreation facilities.

Mr. HALEY. May I ask a question? You say, "The estimated construction cost of the project features of the initial stage * * *."

What do you mean by that?

Mr. PALMER. Mr. Chairman, I believe now would be a good time to have Mr. Charles identify the two proposals, the initial phase and the ultimate phase of the project.

Mr. HALEY. Was he going to do it later?

Mr. PALMER. I thought it might fit in better later.

Mr. HALEY. That is all right then. Go ahead.

Mr. PALMER. Of the project construction costs, reimbursable allocations of about $53,400,000 are made tentatively to irrigation, $29,200,000 to municipal and industrial water supply, and $3 million to future uses. The recreation costs would be nonreimbursable.

The initial stage development has engineering feasibility and is found to be economically justified in that the evaluated total benefits exceed the estimated annual costs in a ratio of 1.26 to 1 for a 100-year period of analysis. If direct benefits only are considered in a 50-year period of analysis, that ratio would be about 0.81 to 1.

Irrigation water users would repay about $8 million of the allocation to irrigation. Repayment contracts would be made with organizations of the type provided in section 4 of the act of April 11, 1956 (70 Stat. 107), for contracting on the participating projects authorized by section 1 of that act. The costs allocated to irrigation in excess of the irrigators' ability to repay would be paid from New Mexico's apportionment of the Upper Colorado River Basin fund revenues as provided in the act.

Costs allocated to municipal and industrial water supply, including interest during construction, would be repaid over a 50-year period with interest on the unamortized balance. Using an interest rate of 2⅞ percent, the total to be repaid by the municipal water users would be about $58,600,000. The cost of raw municipal water would be about 7.7 cents per 1,000 gallons, or about $25 per acre-foot.

Costs allocated to future uses, which involve the provision of excess capacity in the initial stage to permit later project expansion, would also be an obligation against New Mexico's share of the basin fund revenues, to be paid from the apportionment if not otherwise collected as a result of subsequent allocations to the water users. The most recent financial and economic analysis of the authorized development was prepared in December 1958. Schedules presented in that analysis show that by fiscal year 2049, there would accrue to the credit of New Mexico about $141 million in apportioned surplus power revenues, of which only a little more than $2.7 million would be needed for presently authorized participating projects in that State. The irrigation repayment assistance required by the proposed initial stage development of the San Juan-Chama participating project as presently evaluated amounts to about $45.4 million. The analysis also shows that sufficient apportioned surplus revenues required for repayment of this assistance would accumulate by fiscal year 2024.

At this point, Mr. Charles, would you please identify these project features as we go through them?

Plan of development.

Diversion facilities: The diversion facilities would consist of three concrete diversion dams on Rio Blanco and Little Navajo and Navajo Rivers; feeder canals from the headworks of the diversion dams to the main canal; and the main conduit.

Identify those, Mr. Charles, and tell the committee what is contemplated.

Mr. CHARLES. This is Rio Blanco which would be a diversion——

Mr. ROGERS. Please talk louder and show where the Continental Divide is so that these folks understand what the diversion is.

Mr. CHARLES. Here [indicating] is the Continental Divide—this dotted line coming down through here. The three diversion dams would be on the Rio Blanco and the Little Navajo and Navajo Rivers. These feeder canals would tie into the main conduit which would come down along this dotted line [indicating] and would go through the Continental Divide and drop into Willow Creek. This conduit system

is pretty largely tunnels because of the difficulty in keeping canals in place, and the bulk of this line is tunnel [indicating].

Mr. HALEY. Mr. Chairman, just as a matter of information, what is the height of the Continental Divide at that particular point?

Mr. PALMER. Elevation?

Mr. HALEY. Elevation, yes. Is it not right there on the map?

Mr. CHARLES. The map does not show it and I do not seem to recall that figure, but it is something over 7,000 feet, I believe. It is, I believe, pretty close to 8,000 feet but it is not extremely high.

Mr. ASPINALL. If my colleague would yield. That would be considerably over to the left?

Mr. PALMER. May we supply that figure?

Mr. CHARLES. We can check that.

Mr. ASPINALL. Unless there is objection, the figure will be supplied at this point in the record.

(The information to be supplied follows:)

The elevation of the Continental Divide at that point is 7,720 feet.

Mr. PALMER. Regulation facilities: The regulation facilities would comprise the proposed Heron No. 4 dam and reservoir, located on Willow Creek near its confluence with Rio Chama, and the enlargement of the outlet works of the existing El Vado Dam. Heron No. 4 reservoir, which is the "single offstream dam and reservoir on a tributary of the Cham River" referred to in section 2 of the act of April 11, 1956, would have a capacity of about 400,000 acre-feet at normal water surface elevation. The enlargement of the El Vado outlet would permit passing of Heron No. 4 releases through El Vado Reservoir unimpeded in order to insure compliance with the Rio Grande compact.

Do you want to identify any of those works?

Mr. CHARLES. Here is the Heron No. 4 reservoir at the confluence of Willow Creek with the Rio Chama. It is an off-stream reservoir and it is just above the El Vado Reservoir whose outlet would be enlarged so that these waters could pass on through unimpeded.

Mr. HALEY. I cannot see it but where is the Navajo project?

Mr. CHARLES. Here [indicating]; the yellow area shows the lands of the Navajo irrigation project. This is the Navajo Reservoir on the west of the Continental Divide.

Mr. PALMER. Water use facilities: Water allocated to the Middle Rio Grande Conservancy District and to municipal and industrial supply would be released directly to those users from Heron No. 4 reservoir with no specific facilities provided for the delivery of these waters. Releases would also be made from Heron No. 4 to replace in the Rio Grande new water consumed on the tributary irrigation units. Four reservoirs would be required for regulation of tributary flows to furnish water directly to the lands of those units.

Now, Mr. Charles, will you please identify the four tributary units and show the relationship of those units to the main stream and how the replacement water would be put in the Rio Grande to compensate for diversion of water now covered by compact?

Mr. CHARLES. The four units are the Cerro unit on the Red River, a tributary of the Rio Grande; the Taos unit on the Rio-Taos, also a tributary; the Llano unit which is alongside the main stem, and the water supply for the Llano unit which would be diverted directly

from the main stem of the Rio Grande; the Pojoaque unit on the Rio-Pojoaque and Nambe Creek which runs into the Rio-Pojoaque.

The water to replace the additional Rio Grande water that would be provided for these four units to improve those projects would be released from Heron No. 4 reservoir and would be measured at the Otowi gaging station. In other words, as these additional waters are used here, they will be measured and an equivalent amount will be replaced at this Otowi gaging station which is the control point under the Rio Grande compact.

Mr. ASPINALL. What you are saying is that the water which would normally be used from those tributaries (and the water would have to continue flow down) will be held back by the reservoirs provided and used for the purpose for which they must be used because of previous establishment of priority. In the meantime, you will have an exchange from the other reservoir and the diversion will take care of the former uses, formerly provided by the upper reservoir?

Mr. CHARLES. That is right. These people would be supplied down here and this would be replaced by this water in the river.

Mr. PALMER. Operation plan: Available flows of the Rio Blanco, Little Navajo, and Navajo Rivers, all of which are tributaries of the San Juan River, would be diverted by the diversion works and feeder canals through the Continental Divide for release into the Willow Creek watershed of the Rio Grande Basin.

The imported waters would be captured and regulated in the Heron No. 4 reservoir and then released directly into the Rio Chama to fulfill the allocations for several project purposes. Such reservoir regulation would also preclude interference with flows of the Rio Chama and its location would preclude storing any of the flows of the Chama which is the intent of the proviso of section 2 of the act of April 11, 1956. The enlarged outlet works at El Vado Dam would, in turn, permit passing imported water immediately through El Vado Reservoir for the several project purposes. Imported water also would be released from Heron No. 4 reservoir to replace the increased depletions of Rio Grande flows resulting from the tributary irrigation units. An important factor in the rehabilitation of the tributary units is the increased water supply made available through regulation or improved delivery.

A water measurement program is contemplated for project operation to account for both Rio Grande flows and imported San Juan River flows to assure complete replacement of depletions on the tributary units to the Rio Grande.

The plan of development does not contemplate use of the imported waters to meet any deficiencies that now or in the future accrue under the Rio Grande Compact. Also, it is not intended that the flow of the Rio Grande at the New Mexico-Texas line be increased.

Tributary units: The initial facilities would provide a full irrigation supply for about 7,000 acres on the Taos unit, 8,000 acres on the Cerro unit, and 1,900 acres on the Llano unit, in addition to a supplemental supply for 4,000 acres on the Cerro unit, 14,000 acres on the Taos unit, 2,400 acres on the Pojoaque unit, and 2,600 acres of Santa Cruz Irrigation District lands on the Llano unit.

The distribution of the cost of construction of the joint facilities would be $5,100,000 to the Cerro unit, $2,700,000 to the Taos unit, $4,400,000 to the Llano unit, and $600,000 to the Pojoaque unit. The

total cost of the Cerro unit amounts to $11,500,000, which includes $6,400,000 for specific unit features. The irrigation water users would repay $1,400,000 over the 50-year repayment period. The Taos unit costs are estimated at $16,700,000, including $14 million of specific units costs. The water users would repay $3,225,000 over 50 years. The total cost of the Llano unit will be about $6 million, including $1,600,000 for the cost of the specific unit features. About $700,000 would be returned by the water users over the 50-year period. Total cost of the Pojoaque unit is estimated to be about $2,500,000, including $1,900,000 for specific unit features. The water users would repay $800,000 over 50 years. In each case, the amounts above the repayment ability of the water users would be repaid from the Upper Colorado River Basin fund. The estimated benefit-cost ratio for the Pojaaque unit is 1.1 to 1; for the other units it is estimated at 1.2 to 1.

Mr. ASPINALL. Mr. Palmer, is that figure based on a 50-year life or on 100 years?

Mr. PALMER. The benefit-cost ratio is based on 100 years.

Mr. ASPINALL. What would it be if it were on a 50-year basis?

Mr. PALMER. We can supply that.

Mr. ASPINALL. Without objection, it will be inserted in the record at this point.

(The information to be supplied follows:)

The estimated benefit-cost ratios for total benefits of the tributary units on a 50-year basis are as follows:

Cerro unit	1.04
Taos unit	.86
Llano unit	1.12
Pojoaque unit	1.26

Mr. PALMER. Middle Rio Grande Conservancy District unit: The initial stage plan provides for furnishing supplemental irrigation water to the irrigable lands of the Middle Rio Grande Conservancy District now being rehabilitated by the Bureau of Reclamation. These lands comprise about 81,600 acres which were found by classification to be arable and to have repayment capacity. No new irrigation works are provided in this plan. The water would be released from Heron No. 4 reservoir as needed and diverted to the district lands through the existing irrigation system.

The estimated cost of this unit would be about $17 million, which comprises the allocated share of the construction costs of the joint project works. The water users in the conservancy district would repay a total of about $2 million of these allocated costs. The remainder would be repaid from the basin fund. We estimate the benefit-cost ratio for this unit to be 1.2 to 1.

Mr. ASPINALL. That is all on a 100-year basis?

Please furnish material showing it on a 50-year basis.

Mr. PALMER. Yes, sir.

(The information to be supplied follows:)

The estimated benefit-cost ratio of the Middle Rio Grande unit on a 50-year basis is 1.48.

Mr. ASPINALL. At this time—so the committee will understand—which is the acceptable method of figuring; on a 100-year basis or a 50-year basis, as far as the Bureau of the Budget is concerned?

Mr. PALMER. The Bureau of the Budget circular A–47 provides for the 50-year analysis. We can supply this to the committee from the Bureau reports.

Municipal and industrial water supply for Albuquerque. The plan provides for supplying 50,000 acre-feet of water annually for municipal and industrial uses by the city of Albuquerque. Releases would be made from Heron No. 4 reservoir as required to meet the city's demand and would be delivered in the river channel by recharge of the ground water aquifer or at diversions to be provided by the city. The State engineer has assumed jurisdiction over ground-water withdrawals in the Rio Grande Basin and has established regulations that recognize the interrelationship of surface and ground waters in the basin.

The estimated construction cost of municipal and industrial water supply for the city of Albuquerque is $29,200,000. The benefit-cost ratio of this unit is estimated to be about 1.4 to 1.

This is also on a 100-year basis.

Mr. ASPINALL. Can you furnish that for 50 years?

Mr. PALMER. We will supply that.

(The information to be supplied follows:)

The estimated benefit-cost ratio of the municipal and industrial water supply for the city of Albuquerque is 1.10, on a 50-year basis.

Mr. PALMER. The initial obligation of about $31 million which includes interest during construction, would be paid, with interest, by the water users over a 50-year period.

That concludes the statement that is before the committee. I would like to add that the Bureau of the Budget has reviewed the coordinated reports of the San Juan-Chama project and the Navajo Indian irrigation project and it advises it has no objection to the submittal of these reports to the Congress.

The Secretary, by letter of May 19, 1960, recommends enactment of authorizing legislation for these projects.

Mr. ASPINALL. That statement which you just made does not mean that the Bureau of the Budget is wholeheartedly in favor of the project proposed, does it?

Mr. PALMER. The report from the Bureau of the Budget raises a number of questions, sir. However, Mr. Chairman, the letter from the Bureau of the Budget is generally a favorable letter.

It does not recommend the timing of construction or financing.

Mr. ASPINALL. I want the Bureau of the Budget to be placed in its proper position. The Bureau of the Budget, using the formula which it uses at the present time, does not find this project to be feasible, does it?

Mr. PALMER. It raises questions only at this point.

Mr. ASPINALL. The Bureau of the Budget on all of these projects, not only on one but for all of them, does that.

I am trying to let the committee and the people here know that we do not have a coordinated report from the Bureau of the Budget and the Department of the Interior in this instance, just as we did not have it in the Mid-State, and just as we will not have it in the Fryingpan, so let us quit kidding ourselves.

The Executive has two arms, one is the arm you represent and the other is the Bureau of the Budget. They are not together on these projects.

Congress may have to do something to get them together but they are not together at this time.

Will you take about 5 minutes, Mr. Palmer, and explain to us what the ultimate stage of this project is. We know that the initial phase is being considered here, and we hope it will be authorized in the time necessary. We will have the ultimate phase before us, so let us have a description of that.

Mr. PALMER. Mr. Charles, will you please discuss the ultimate phase and pay particular attention to where it is different from the initial phase.

Mr. CHARLES. The ultimate phase is larger in that it would import 235,000 acre-feet of water annually into the Rio Grande Basin.

Mr. PALMER. As compared to how much in the initial?

Mr. CHARLES. As compared to 110 in the initial phase.

That water would be obtained by going back up on the Rio Blanco, putting in a reservoir, extending this tunnel line back up to the East and West Forks of the San Juan, and putting reservoirs on both the East and West Forks of the San Juan River. That would be necessary in order to accumulate the water to bring it over to the Rio Grande side.

The water would be used very much as it is proposed to be used in the initial stage.

In addition to these four projects there is one more unit on the Cimarron which would be supplied additional water, and that would require a diversion from the Red River over into Cimarron Creek and it would be used on what we call the Cimarron unit.

Mr. ASPINALL. What you are saying is that you propose another transbasin diversion out of the Rio Grande Valley into the valley of the Canadian River?

Mr. CHARLES. That is right.

A small amount of the additional water would be used in the Middle Rio Grande Conservancy District, and according to that original plan as set up in 1955, and it has not been changed because there has been no justification for changing it, the remainder would be used on the Elephant Butte Irrigation District.

Mr. ASPINALL. It would be used for municipal purposes in the Albuquerque area?

Mr. CHARLES. It would be available for additional municipal and industrial purposes. It has been assumed, and advocated, by the State of New Mexico that as the changes take place in there, as more industry comes in, it will actually be needed.

At the present time the Elephant Butte Irrigation District has stated they do not want that water, but there would have o be additional studies made to determine what uses there were for that water at some time in the future. New Mexico does not care to make a determination now as to how that——

Mr. ASPINALL. Is the benefit-cost ratio of the initial phase figured on a 100-year basis?

Mr. PALMER. It is on a 100-year basis, also.

Mr. ASPINALL. What is it?

Mr. PALMER. 1.7 to 1.

Mr. ASPINALL. What is the benefit-to-cost ratio of the ultimate stage?

Mr. PALMER. I beg your pardon, 1.26 to 1 on the initial stage and 1.7 to 1 on the ultimate stage.

Mr. ASPINALL. For the 100-year analysis?

Mr. PALMER. Yes.

Mr. ASPINALL. For the 50-year analysis basis?

Mr. PALMER. 0.81 to 1 in the initial stage. I do not have it on the ultimate but I will supply it.

Mr. ASPINALL. Put it in the record at this point, please.

(The information requested follows:)

The estimated benefit-cost ratio of the total project under ultimate development on a 50-year basis is 1.47.

Mr. ASPINALL. Thank you very much.

Mr. HOSMER. Do you have any idea what this will do to the quality of the water in the Colorado River Basin?

Mr. CHARLES. There will be statements made on that. I believe there is one that will follow.

Mr. HOSMER. Will somebody make that statement later, then?

Mr. PALMER. Because of the relatively small quantity of water in terms of total flow that will be diverted it is not anticipated this would have any major, or appreciable effect on the quality of the water of the Colorado.

Mr. HOSMER. It is practically the same answer given with respect to every proposed transmountain diversion, but when taken in the aggregate there is an effect, and it is serious effect. I hope you gentlemen are prepared to discuss that.

Mr. BURNETT. In that connection I might add we have an extensive program going on now to study the quality of water. It will not be until about 1963 that we will have a progress report that will give us any firm indication of what effects it might have.

Mr. HOSMER. In other words, you cannot today say whether this will diminish the quality of the water in the Colorado River Basin, whether it would have a serious effect on the people who must depend on it in the Colorado River Basin, can you?

Mr. BURNETT. No, sir.

Mr. MORRIS. On the basis of all the engineering criteria and knowledge that you have in your Department today you can say it will not have any adverse effect on the water of the lower Colorado, can you not?

Mr. PALMER. The question you pose is a difficult one, Mr. Morris. I would think in view of the ultimate diversion of 200,000-odd acre-feet of water out of a total contribution of that basin of over 1½ million acre-feet annually on the average, I would think it would be reasonable to say that the adverse effect on water quality, would be negligible.

Mr. MORRIS. You are an engineer, are you not, Mr. Palmer?

Mr. PALMER. No, sir, I am an economist, Mr. Morris.

Mr. HOSMER. Is it not true that this quantity of water must necessarily be added in to arrive at the total amount?

Mr. PALMER. That is correct.

Mr. HOSMER. And it is the total amount of diversion that would have an effect upon the quality of the water in the river?

Mr. PALMER. That is correct.

Mr. HOSMER. Then it is not negligible from that standpoint, is it?

Mr. PALMER. The question would have to be resolved in terms of many considerations. One, the quality of the water in the San Juan with respect to the quality of the water in the main stem.

The quality of the water in the remaining portion of the San Juan after diversion with respect to the water quality in the main stem.

Mr. HOSMER. Diverging at high altitude where the water is essentially pure to begin with. Is that right?

Mr. PALMER. Yes.

Mr. HOSMER. So you are eliminating this important dilution factor with water of a quality having a greater effect on the ultimate quality of the water downstream. You eliminate it at some place lower where the water is not as high in quality.

Mr. PALMER. The questions you pose are those with which we are concerned in the review and study of the water quality problems of the Colorado.

As Mr. Burnett has said, it will be some time before we will have any factual engineering basis for giving you specific replies.

Mr. HOSMER. Did you not just tell Mr. Morris the effect will be negligible? You do not mean that because you have no facts and figures on which to base such a statement, do you?

Mr. PALMER. I gave him my view it would be negligible and it is still my opinion.

Mr. HOSMER. You also disclosed it is an unsupported opinion.

That is all.

Mr. HALEY. Some of this water in the initial stage there is being taken from a stream that feeds the Navajo project. Is that correct?

Mr. PALMER. That is correct. The water that would be diverted to the Rio Grande is water that flows now in tributaries of the San Juan River.

Mr. HALEY. How much water will you take away from the Navajo project?

Mr. PALMER. None. There is enough in the operation of the river system with Navajo Dam and Reservoir in place and with the other facilities contemplated so that you would not be depriving the Navajo Indian irrigation project. There would be——

Mr. ASPINALL. You have to be very careful because you have a large area in the Navajo part. If you have the water you can develop much more land than is contemplated at the present time.

If my colleague will permit me, this program is based upon New Mexico's right under the Colorado River Compact for a certain percentage of the waters of the Colorado River.

What is proposed here is to limit the Navajo project.

What Mr. Palmer is telling us is that as now contemplated the diversion to the Rio Grande would not hinder the presently contemplated Navajo project.

Mr. PALMER. That is correct.

Mr. HALEY. Yes, but you are taking water from the west side of the mountain and transferring it over to the eastern side, and if there is later need for additional water for the Navajo project or in that immediate vicinity you are taking away water that would be available if you wanted to enlarge on the western side. Is that correct?

Mr. PALMER. That would be correct.

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Mr. HALEY. How much does that water amount to, referring to the water you have taken away from the Navajo side?

Mr. PALMER. The initial phase is 110,000 acre-feet.

Mr. HALEY. How about the ultimate stage?

Mr. PALMER. 235,000 acre-feet.

Mr. HALEY. That includes the 110?

Mr. PALMER. Yes, sir.

Mr. ASPINALL. The acting chairman of the committee understands the interest of the gentleman from Florida in Indian affairs because there has been no better public servant in behalf of the Indians than the gentleman from Florida.

Of course, this is a problem which New Mexico must assume with regard to the division of its share of the Colorado River water.

I know my colleague's position, and he will state that New Mexico more than likely will be unable under certain treaties to take from the Indians the water to which they have a right. I think that is the position he is trying to establish and place in the record at this place.

Mr. HALEY. The acting chairman is exactly right. I just do not want later on to have developed that I realize the right of the State to use these resources in any manner they see fit. I merely wanted to make my position known that I did not want to be in the position later on of having the Indians come back and saying they do not have enough water on the Navajo project and the reason they do not have it is because of this transmountain diversion here and something has been taken away that they thought they had and now need.

I hope that never will happen but there is that possibility.

Mr. PALMER. In addition to the observations made by the chairman, I would like to observe that sizable Indian holdings are served by the transmountain diversion at several points here within the Rio Grande Basin.

Would it be perhaps as much as a half of the water for irrigation?

Mr. CHARLES. That is right.

Mr. ASPINALL. I think you have to be very careful when you get to that phase. The people in the Rio Grande area could not be said to have any of those rights in the Colorado River.

Mr. PALMER. I think that is correct.

Mr. HALEY. That is all.

Mr. ASPINALL. The Chair recognizes our colleague from California.

Mr. HOSMER. What is the total amount of land that will be irrigated in the initial stage?

Mr. CHARLES. 121,000 acres.

Mr. HOSMER. What is involved per acre per year to the irrigator by way of costs and charges?

Mr. CHARLES. The operation and maintenance costs are $5.04 on Cerro project, $4.15 on the Taos, $6.66 on the Llano, $5.52 on the Pojoaque, and is a portion of the total on the Middle Rio Grande. This small portion is 83 cents out of about $7 this year.

Mr. HOSMER. What is the average size of the farms irrigated?

Mr. CHARLES. That is a mighty difficult question but they run very small in those upper tributary units. They are small holdings.

Mr. HOSMER. Will they be able to afford that kind of charge?

Mr. CHARLES. We feel they will on the basis of the economic studies and the farm budgets that we have developed for those areas.

Mr. HOSMER. If you improve your calculations in these respects over what you have come in here with before so that the irrigator can pay? Then after the project has come along the irrigators come back and say they cannot possibly pay the large amount of money and want to renegotiate their contracts and extend the repayment period.

Mr. PALMER. If I might make a general observation to that statement, sir. There are in full force and effect some 1,700 repayment contracts in the Bureau of Reclamation involving some billion-dollars-plus that will be returned to the Treasury.

It has been our unfortunate duty to come to this committee of Congress for 41 of that number.

Mr. HOSMER. Of how many?

Mr. PALMER. Forty-one of one thousand and seven hundred. We believe that is a pretty good record even if you would analyze it in terms of banking experience, for example.

Our percentage of collections of those billion dollar face value contracts outstanding are virtually current. The amount that has not been paid on schedule is so negligible it hardly shows.

Mr. HOSMER. Your power revenues will greatly subsidize the irrigation.

Mr. PALMER. Yes, sir.

Mr. HOSMER. About how much is subsidy?

Mr. PALMER. It runs about 75–85 percent, in that range, depending on the unit of the project.

Mr. HOSMER. You will require at least $1 million-plus a year of power revenue.

Mr. PALMER. The amount of the total support I gave, as I recall it, was about $45 million in the 50-year period, so it would be about $1 million a year annually.

Mr. HOSMER. On page 4 of your report you speak of the New Mexico allocation. Power revenue is $141 million, but on a 50-year basis, assuming this project was built and operating in 1965, the payout would come by 2015. Do you know how much power revenue you would anticipate getting by that year?

Mr. BURNETT. By 2015 there would have accumulated—or New Mexico would have accumulated—almost $15 million.

Mr. HOSMER. So you have at least a $35 million or $40 million deficit insofar as this project is concerned in the power revenue that is supposed to pay for it.

Mr. BURNETT. But as construction of the projects are completed, the period at which the 50-year payout would start would be later than 1965.

Mr. HOSMER. You speak of this initial stage, then?

Mr. BURNETT. That is correct.

Mr. HOSMER. The major expense is going in at one time, is it not?

Mr. BURNETT. If I may explain this, Mr. Hosmer, figuring our preconstruction planning and our construction period, and predicated on authorization this year, we would expect that the project would be completed in about 1967.

At the end of 2017, at which time water would have to be available for delivery to the Middle Rio Grande Conservancy District, for which there is no development period, there would be some $19 million accumulated in surplus revenues.

Mr. HOSMER. As against an allocation of what?

Mr. BURNETT. $15 million for the Middle Rio Grande Conservancy District to be repaid from power revenues.

Mr. HOSMER. How about the whole thing?

Mr. BURNETT. Considering the tributary projects, which have a 10-year development period, we then go to 10 years later, which would be 2027. We now have accumulated revenues of $54 million, which is about $10 million more than the total requirement.

Mr. HOSMER. Do you have any confidence in those estimates?

Mr. BURNETT. Yes, sir.

Mr. HOSMER. That is all, Mr. Chairman.

Mr. ASPINALL. The gentleman from California, Mr. Sisk.

Mr. SISK. As I understand it, the State of New Mexico, under the Colorado River compact, is entitled to so many hundred of thousands of acre-feet of water. Is that correct?

Mr. PALMER. That is right, sir.

Mr. SISK. In essence, what is involved here is the fact that the State itself has the right of determination of how it shall divide and use these waters. Is that correct?

Mr. PALMER. Yes, sir.

Mr. SISK. The Navajo project is for the purpose of taking care of the people in this area and it has been determined they shall have a specified amount of water?

Mr. PALMER. Yes, sir.

Mr. SISK. This is a determination made by the State of New Mexico?

Mr. PALMER. That is correct.

Mr. SISK. How many acre-feet of water is that?

Mr. BURNETT. The depletions for the Navajo Indian irrigation project will amount to about 252,000 acre-feet a year. The diversion requirement will be 508,000 acre-feet.

Mr. SISK. 508,000 acres?

Mr. BURNETT. That is the diversion requirement in acre-feet for the Navajo project.

Mr. SISK. The total that the State of New Mexico has under the compact is 838?

Mr. BURNETT. That is a depletion allowance. That is the amount of water that New Mexico can deplete the flows.

Mr. SISK. 838,000 acre-feet.

Mr. BURNETT. Yes, sir.

Mr. MORRIS. Let us give the depletion figures again to the gentleman from California so he will understand them. The New Mexico depletion is 838,000. Is that correct?

Mr. BURNETT. Yes, sir, based on the estimated amount by the State of New Mexico.

Mr. MORRIS. Come again?

Mr. BURNETT. That is the depletion allowance under the Upper Colorado River storage compact that is estimated by the State of New Mexico.

Mr. SISK. Of that 838,000, 508,000 are committed to Navajo?

Mr. BURNETT. No, sir.

Mr. SISK. That is what I want clear.

Mr. BURNETT. 252,000 acre-feet.

Mr. SISK. I want to know what kinds of figures we are talking about. The depletion figures for Navajo is what?

Mr. BURNETT. 252,000.

Mr. SISK. That leaves a total of 586,000 after you take off for Navajo. Is that right?

Mr. PALMER. That is right.

Mr. SISK. I understand these are depletions, Mr. Morris.

Against that, what is your figure on depletion then for the ultimate stage?

Mr. BURNETT. 235,000 acre-feet.

Mr. ASPINALL. May the Chair advise his colleague that he will get into a hopeless situation if he tries to get into all of these figures because there is much more involved.

Mr. SISK. I appreciate your remarks. I am sure it is a complicated and complex figure.

The basic point of my question was, of course, that even in the ultimate stage there is no possibility that San Juan-Chama could require more water than what Mexico's actual allocated rights to the water under the compact are.

Mr. PALMER. Not by the San Juan-Chama; that is correct.

Mr. SISK. Including the amounts already committed to Navajo?

Mr. PALMER. That is right.

Mr. ASPINALL. That is a question which must be determined later on. There is no agreement as a basis for that statement.

Mr. SISK. I believe that is all, Mr. Chairman.

Mr. ASPINALL. The gentleman from Minnesota?

Mr. LANGEN. I believe you stated there are to be 110-plus thousand acres to be irrigated?

Mr. PALMER. That is right.

Mr. LANGEN. What kind of area is this?

Mr. PALMER. This is long-established general farming area. Most of the crops grown in this area are grown for direct consumption by the people there—beans, chile, some fruit, some alfalfa, some small grains. It is a general farming area, largely for local consumption.

Mr. LANGEN. Do you have any kind of breakdown as to the total number of acres?

Mr. PALMER. We can supply an estimated breakdown. The smaller grains that are grown are generally either fed directly there or—this is not a commercial grain area.

Mr. LANGEN. How many farmers would be on this acreage?

Mr. PALMER. I would guess in some of these areas the average size of the farm would be less than 10 acres, so you probably have 10,000 farms in the area. That is what we would call a farm. The farms are very, very small.

Mr. LANGEN. 10,000 farms?

Mr. PALMER. On 110,000 acres in that area I would guess you would have as many as that.

Mr. LANGEN. Is there a family on each one?

Mr. PALMER. We do not show the number of farms. I participated in several surveys in that area a number of years ago and we were amazed at the number of "family-sized" farms there. The limited income derived from the farm was the only income these people had. They were getting it from 5, 10, and 15 acres and many on smaller tracts. Many supplemented farm income from off-farm work, on roads, driving schoolbuses, and other miscellaneous employment in the area.

Mr. LANGEN. Are these people living there and established now? I recall somewhere in the literature there was some movement of people taking place.

Mr. PALMER. They are all established there now.

Mr. LANGEN. They are all established there now?

Mr. PALMER. This is an existing economy. As a matter of fact, Mr. Langen, some of this area was already settled and already being farmed over 400 years ago, when the first Spaniards came up into that area.

Mr. LANGEN. How much water is required per acre per year? I believe there was a cost figure given of $5 an acre varying for different projects.

Mr. PALMER. Bear in mind again that virtually all of this water goes to supplement existing supplies to round out and give them a better water supply and better seasonal distribution of water deliveries.

What we are talking about in terms of acre-feet per acre, in terms of total use, is more nearly two and a half.

Mr. BURNETT. It varies on the several units. I can give you those figures if you would like to have them.

Mr. LANGEN. I would.

Mr. BURNETT. On the Cerro, and these are consumptive use in acre-feet per acre, 1.95 acre-feet; 2.6 on the Taos; 2.38 on the Llano; 2.30 on the Pojoaque. In the Middle Rio Grande Conservancy District area it is 2.37.

Mr. LANGEN. That includes all of the canals? The distribution system is by canals?

Mr. PALMER. Yes. There would be some rehabilitation in the tributary units.

Mr. LANGEN. What is your experience with the canal system in the period of time that such a construction will last before it needs to be remodeled or reconstructed?

Mr. PALMER. This is a question that has all kinds of answers. The major canal system frequently gets better as time goes by. There are some small irrigated tracts in Utah with which I am familiar where the original canals are still in operation after over 100 years of use.

The structures in the canals, the turnouts, checks, and so on, may have a service life of anywhere from 10 to 50 or 60 years depending on the material from which they are built and how well they are maintained. These are replaced as a part of the operation and maintenance programs.

In the operation of an irrigation system, if it is well installed in the beginning and it is properly maintained, there is virtually no deterioration in the works themselves.

A canal settles and gets better, tighter, and easier to run and maintain as time goes on.

Mr. LANGEN. You do not anticipate, then, large reconstruction expenditures in the distribution system during the payout period of 50 years or more?

Mr. PALMER. In computing those figures that Mr. Charles gave you, there is a component set aside for replacements. For instance, a wooden gate might go out and have to be replaced in 10 or 20 years, but that would be part of the regular maintenance program and it is provided for in the regular operation and maintenance cost estimates.

There were some figures included in the testimony that Mr. Charles earlier gave which take that into consideration.

Mr. LANGEN. The extent to which those canals are completed—does that lead up to every one of these individual farms and then the farmer himself carries on? What is the relationship?

Mr. PALMER. Under the Bureau system we have followed ever since there has been a Bureau, we take the water to the farmer's headgate. In some of these areas where there are maybe 2-, 3-, or 4-acre farms, we would provide one turnout for every 40 acres—or perhaps some smaller than that—and the local organization would distribute the water.

From the farmer's headgate on, in any instance it is his problem.

Mr. LANGEN. What is the potential value of crops per acre here? You mentioned the farms were very small. What kind of a potential farm area do you have?

Mr. PALMER. It might be $80 to $100 average for the valley. We can supply those figures, but bear in mind that this is pretty largely a subsistence farming economy. It has been in business on that sort of operation since before the first Spaniards came in there. You will not change that pattern overnight, so they will continue to farm on a small-sized holding and they will supplement their farm income from off-farming employment wherever possible. They have a pretty good living out of it, but not a high standard as measured elsewhere.

Mr. LANGEN. How many of these farmers are there? You say they are supplemented by off-farming funds. What sorts of things do they do?

Mr. PALMER. There are all kinds of odd jobs—highway work, road work, work on the range. This whole country is surrounded by grazing land.

Mr. ASPINALL. We will have people from New Mexico here this afternoon who are advocating this legislation and those questions could be asked and answers given more directly by them.

Mr. LANGEN. I am not sure I will be here.

Mr. ASPINALL. Proceed.

Mr. LANGEN. Are they full-time jobs?

Mr. PALMER. These farms are the principal source of livelihood for the people who reside in this area, yes. This is the point I have been trying to make: Do not consider this in terms of the 260- or 320-acre farm which characterizes the northern irrigation projects or the large dry farms. This is an area of small-sized farms.

Mr. LANGEN. I have no further questions.

Mr. RUTHERFORD. All the construction is within the boundaries of the State of New Mexico?

Mr. BURNETT. No, sir. Part of the diversion facilities are in Colorado.

Mr. RUTHERFORD. Actually there are five States that are concerned, or should be concerned, with this project. Members of the Rio Grande compact—other than the members of that compact will be Arizona and possibly California?

Mr. BURNETT. That is right.

Mr. RUTHERFORD. Have you completed a survey and can you conclusively state the repayment flow into the Rio Grande to supplement the diversion as to its quality and quantity that will maintain the present flow?

Mr. BURNETT. I do not quite understand the question.

Mr. RUTHERFORD. The repayment flows, in other words, that you are diverting from the Rio Grande and the other projects that you envision here to repay the flow to sustain the flow of the Rio Grande from which you are diverting. Do you have conclusive surveys that the Rio Grande will receive its equitable present share of the water?

Mr. PALMER. Yes, Mr. Rutherford. This is the point I covered earlier, and Mr. Charles outlined that gaging stations will be established throughout this entire area, in order to carefully check the amount of water taken from the Rio Grande for these tributary irrigation units, it will be replaced into the main stem of the Rio Grande.

Mr. RUTHERFORD. Should these tributaries to supplement the flow not be adequate, then irrigation stations on your imported water would be released to the Rio Grande to make up any inadequacy of your supplementary tributaries that you may have?

Mr. PALMER. A balance would be maintained so any water diverted from the Rio Grande for the tributary units or the Middle Rio Grande Conservancy District would be replaced by water imported from the transmountain diversion.

Mr. RUTHERFORD. In other words, without qualification you can state that the flow of water in the Rio Grande will not be increased nor decreased?

Mr. PALMER. We can make such a statement; yes, sir.

Mr. RUTHERFORD. And that if any unit which you have, such as the Llano unit or the Cerro unit, down that line is not sufficient, it would be supplemented by the imported water. In other words, none of the imported water would be utilized to improve the deficiencies under the Rio Grande compact which we would agree to?

Mr. PALMER. That is right.

Mr. RUTHERFORD. However, if the imported water is necessary and needed to continue to balance the flow in the Rio Grande from these tributaries that you have more or less allocated for that purpose, then imported water would be used?

Mr. PALMER. That is correct. The significant thing is that a broad plan of gaging has been devised which would assure Texas, for example, that there will be no depletion because of the tributary irrigation which would not be replaced by transmountain diversion. The authorizing act provides for the development of a detailed water measurement program prior to construction. That is part of your question, I believe.

Mr. RUTHERFORD. That is it.

I might say I concur, with qualifications, in the rather ambitious objectives of this measure. Are you aware that in Mr. Morris' bill, H.R. 2352, the Texas provision is incorporated in the bill in section 6(a), subsections (i), (ii), and (iii) of that section?

Mr. CHARLES. That report has not been prepared. That will be the first thing required if this is authorized.

Mr. RUTHERFORD. Have you any contemplated suggestions, changes, alterations, or deletions to subsections (i), (ii), and (iii) on page 7 of Mr. Morris' bill?

Mr. CHARLES. No, sir.

Mr. RUTHERFORD. That is all, Mr. Chairman.

Mr. ASPINALL. I recognize my colleague from Colorado, Mr. Chenoweth.

Mr. CHENOWETH. Mr. Palmer, I want to inquire concerning acres involved in this project. Are you going to bring new lands into cultivation?

Mr. PALMER. It is not anticipated new land will be brought in except in small amounts in the tributary units.

Mr. CHENOWETH. You will provide only supplementary water?

Mr. CHARLES. New lands are interspersed among the existing irrigated land in these tributary units.

Mr. CHENOWETH. How much new land will be brought in?

Mr. CHARLES. I believe the total is about 16,000 acres.

Mr. BURNETT. Yes, sir, that is right, 16,000.

Mr. CHENOWETH. What is the total amount of acreage that will be furnished water by this project?

Mr. CHARLES. The total is 121,000.

Mr. CHENOWETH. 16,000 of the 121,000 would be new land, then?

Mr. CHARLES. Yes, sir. These new lands are all in these small tributary areas.

Mr. CHENOWETH. I wish to ask about the relation between the initial and the ultimate phases. What is the time element involved? All you are contemplating now, as I understand it, is the initial phase.

Mr. PALMER. The only thing contemplated now is the initial phase.

Mr. CHENOWETH. What are the general plans for the ultimate development, or do you have any plans at this time?

Mr. CHARLES. New Mexico does not know yet where it wants to use this water, so we could not answer.

Mr. ASPINALL. Let us go a little fuller into the question of my colleague. New Mexico's rights under its percentage of the net power revenues of the Upper Colorado River program have a great deal to do with what is going to happen as far as the ultimate program, and also anything else, because in the Upper Colorado River Storage and Development Act we are committed in this respect. New Mexico, like Colorado or Wyoming or Utah, will be able to get moneys only at certain times. These projects depend upon the availability of those net revenues.

Mr. CHARLES. Yes, sir, and where the demand develops.

Mr. ASPINALL. That is right.

Mr. CHENOWETH. As I understand, all you contemplate is 110,000 acre-feet at this time. The ultimate phase would be 235,000 acre-feet. You do not know where you are going to use that. There is no demand for this additional water now, as I understand it. No one is interested in it, so you are letting the ultimate stage wait for further developments.

Mr. PALMER. Except as modified by the statement of the chairman. The chairman just indicated that there are two items. One is the availability of revenues, and the second is the tying down of the area where the water would be used.

Mr. CHENOWETH. Did you figure both of these stages at the same time?

Mr. PALMER. The initial stage is the one which is now proposed. The reconnaissance information was assembled for both stages at the same time.

Mr. CHENOWETH. Did you originally contemplate only one stage?

Mr. PALMER. We originally planned an ultimate project, and from that project took out the initial phase.

Mr. CHENOWETH. You divided the project in half? You split the project?

Mr. PALMER. Yes, sir.

Mr. CHENOWETH. Was there too much involved for one project? Is that why you decided on the two stages?

Mr. PALMER. There are many questions which have to be resolved before we would initiate the second or ultimate phase.

Mr. CHENOWETH. Thank you, Mr. Chairman.

Mr. ASPINALL. I recognize my colleague from New Mexico.

Mr. MORRIS. Mr. Chairman, I should like to say one or two things.

First, with regard to the type of farming in the tributaries, these farms are not commercial farms by any stretch of the imagination. These people have lived in this area for hundreds of years, and their families have lived there for hundreds of years. In comparison to some parts of the country, this might be considered a rather primitive area. The crops which are grown there are used by these people to feed their families. I do not think there ever has been a grain of oats or a grain of wheat sold commercially to an elevator from these tributary irrigation districts, nor do I think there will ever be. These people have very little cash income during the year. The income they have is made by working at sawmills or by working in sugar beet fields in Colorado or other large farming operations in various parts of our State and other places.

This project, as far as the agricultural aspects of it, will not have any effect on the marketing of agricultural products. I think I can say that without reservation. It will not have any effect.

Mr. LANGEN. Will the gentleman yield?

Mr. MORRIS. I am happy to yield.

Mr. LANGEN. I did not ask these questions for the purpose of being critical of the project in any sense, but rather from the standpoint of better understanding. I note you make reference to the fact that supposedly not any of these agricultural products are sold. Where are they to derive the revenue with which to make the payments of $5 an acre, or whatever the payments may be?

Mr. MORRIS. From this outside income.

Mr. LANGEN. They will have to have an outside job in order to make these payments?

Mr. MORRIS. They have to have an outside job—period—in order to live.

Mr. LANGEN. So then the benefits to these people result substantially from the fact that more food will be produced and more food will be available to them. Their benefits derive in that manner. Is that correct?

Mr. MORRIS. That is right. I said no food had been sold from these farms, but they do sell chili from house to house in towns like Albuquerque and places where they can sell it.

Mr. LANGEN. Thank you.

Mr. MORRIS. But not any of the basic commodities in which the country is vitally interested and the surplus of which we are all concerned about.

Mr. LANGEN. I thank the gentleman.

Mr. MORRIS. I might also say with regard to the ultimate stage of the San Juan-Chama, I do not think anyone really knows in the State of New Mexico or anywhere else at this time whether we shall ask for the ultimate stage to be authorized by Congress. I think if

the demand develops in the San Juan Basin around Farmington and in that area for this water, authorization of the ultimate stage or second stage of the San Juan-Chama will never be asked. Preliminary plans have been developed and the State of New Mexico wants to keep that open. We want to use our water where it will do the most good for the State.

I might also say to my good friend, the gentleman from Florida, the chairman of the Indian Affairs Subcommittee—all on this committee know of his great interest in the Indians of our Nation and all the fine things he has done for them—that the Indians of our State have been kept informed of this legislation and have been in on the planning from its very inception. The chairman of the Navajo Tribe is here in the room and will testify on this legislation. Certainly I share your concern for the Indians, just as the rest of the committee does. I wish to commend the gentleman from Florida for his pertinent questions.

That is all I have at this time, Mr. Chairman.

Mr. ASPINALL. Mr. Palmer, this is the first one of the participating projects, the so-called "planned group," that the Bureau of Reclamation, Department of the Interior, has brought before Congress. Is that not right?

Mr. PALMER. Yes, sir; that is right.

Mr. ASPINALL. Inasmuch as the Animas-LaPlata is so closely related to this, would it not have been easier for the Congress to have decided the equities between these two if you had had a report on that available for us?

Mr. PALMER. I think without any doubt it would have been desirable had both reports reached you at the same time. The report on the Animas-LaPlata is being expedited and is coming forward as rapidly as we can put it together.

Mr. ASPINALL. Both of these projects have the same priorities insofar as the request in the original Colorado Storage and Development Act, have they not?

Mr. PALMER. Yes, sir.

Mr. ASPINALL. I would appreciate it very much if it would be possible for the Department to have a report ready for us for the year 1961, or at least have ready for us something on which we can make a determination on some of the related problems.

Mr. PALMER. We shall be glad to do this. We shall be glad to work with you, Mr. Chairman, and see what kinds and types of information we can make available and get it together.

Mr. ASPINALL. I know what you are up against as far as money and personnel are concerned. I just want you to move a little bit faster.

In your statement you say your coordinated plan reports were based on criteria and recommendations for the development of the project as submitted by the State of New Mexico. Is that your usual procedure?

Mr. PALMER. In this particular instance it is the way this one unfolded because of the various considerations of utilization of the State's Colorado River entitlement. As a matter of fact, in virtually every instance we work closely with the State people in the development of plans for the utilization of the State's water.

Mr. ASPINALL. Then it is your usual procedure when the State does its part, when it gets out and helps, is that not right?

Mr. PALMER. That is right.

Mr. ASPINALL. You have made a statement about the matter of interest. You have stated that if the interest were 2⅞ percent on the moneys used for construction of those reimbursable interest-bearing facilities, the amount of interest would be such and such. You are well aware of the fact that at the present time we do not have authority to charge that amount of interest; is that right?

Mr. PALMER. That is right.

Mr. ASPINALL. And that the interest formula used in the Colorado River Storage and Development Act is out of line with the formulas which are used in other instances in water resource development; is that not so?

Mr. PALMER. Yes, sir; that is correct.

Mr. ASPINALL. Do I understand from your statement and from the material which you have used, that the irrigation features of this project and the municipal features of this project, those items calling for reimbursable allocated funds, can be paid out within 50 years from the date of the beginning of service from the projects or from the date of construction, which would be the same thing?

Mr. PALMER. That is so, considering the scheduling of the development of the tributary units and the development period which would be allowed on those. There would be no development period for the middle Rio Grande area and the scheduling would permit the concurrent payout with power revenues available to New Mexico.

Mr. ASPINALL. That means the allocation to these various items which must be repaid from power revenues can also be paid out within the 50-year period?

Mr. PALMER. According to our analysis, it falls within that period.

Mr. ASPINALL. Mr. Palmer, what is the effect of joining these two projects, the Navajo participating project for the Indians and the San Juan-Chama irrigation and municipal water project?

Mr. PALMER. The principal effect is to bring about a coordinated development of the State of New Mexico's water in the San Juan Basin and the Colorado River drainage. It permits the State to plan and unfold its program in an orderly fashion.

Mr. ASPINALL. There is no intention of bringing the Navajo irrigation project under the provisions of the Reclamation Act as such, or dependent upon any of the reclamation funds; is that correct?

Mr. PALMER. Yes, sir; that is correct.

Mr. ASPINALL. There is no intention, as far as the legislation is concerned, as far as the Department is concerned, of receiving any contribution whatsoever from the basin fund of the Colorado River storage and development project for the Indian projects; is that correct?

Mr. PALMER. My understanding, based on the wording of the bill, the first part of it——

Mr. ASPINALL. We will not go into that. If you do not have the answer, I will ask it of somebody else. What I want to know is whether this is a pure and simple Indian project, the Navajo participating project, or whether in your mind it is a reclamation project.

Mr. PALMER. In my mind, it is purely and simply an Indian irrigation project.

Mr. ASPINALL. And has no rights to any of the funds of the Colorado storage and development basin fund?

Mr. PALMER. This I would believe would be the situation, based on the instructions of the Congress, as contained in the upper Colorado authorization and on the bills now before the committee.

Mr. ASPINALL. The reason I bring it up is that these two projects are handled so closely together here in this legislation. I think it would be far easier to explain if we had a title I for one project and title II in the same bill for the second project.

The project as contemplated by the Bureau does have a direct effect, has it not, upon the Animas-LaPlata project?

Mr. PALMER. Only to the extent of the availability of water within the basin. You have to consider the entire water supply, both that originating in the Animas-LaPlata Basin and that originating in the San Juan Basin, and how you apportion shortages, if there are any, between the various entities served under the river system.

Mr. ASPINALL. The Bureau does consider that could be an agreement arrived at between the two States and not an agreement arrived at by the Bureau or not a matter of supervision by the Bureau; is that correct?

Mr. PALMER. That is correct. Mr. Chairman, I have a prepared statement covering procedures for sharing water supply during periods of shortage in the San Juan River Basin. This goes to section 7 of the bills. You may want to include this statement in the record.

Mr. ASPINALL. Without objection, the statement referred to will be included in the record at this point.

(The statement follows:)

APPLICATION OF PROPOSED PROCEDURES FOR SHARING WATER SUPPLY DURING PERIODS OF SHORTAGE, SAN JUAN RIVER BASIN

The objective of section 7 of H.R. 2352 and 2494, broadly stated, is that during times of water shortages, water users will each assume a pro rata share of that shortage. To state this another way, each water user, in times of short supply will share that supply, rather than to rely upon a system of priorities. Adoption of this objective or principle leads to broader resource development.

The principle would apply only to water to which the United States has a right, with the exceptions of certain small existing Indian projects and extensions thereto. Valid prior existing rights to water would, of course, not come under the principle but would continue to be senior. Available inflow to be shared is then the actual, or estimated, or forecasted inflow minus sufficient water to serve diversions not subject to the sharing principle.

Operating studies made by the State officials show that the principle is workable within the limits of contracts for water which the Secretary might reasonably make. As provided in the last sentence of section 7(a), the Secretary would be precluded from making contracts in amounts such that application of the principle would create intolerable shortages.

The sharing of shortages principle is deemed essential by both the State of New Mexico and the Navajo Tribe in the interests of providing reasonable assurances of the availability of water for future municipal and industrial uses. In order to broaden the base of economic opportunity in the area both the State and the tribe wish to encourage such uses within reasonable limits that will not impair the feasibility of the irrigation developments proposed in the legislation.

The have both requested, therefore, that the Secretary of the Interior administer the available water supply in such manner as to give effect to the principle of equality in the sharing of that water. This would be accomplished through the medium of contracts covering uses hereinafter instituted embracing the sharing of water concept. Obviously, the key to assuring that the available water supply will not be overburdened by demand in the event of shortage, to

the consequent detriment of all users, lies in the determination of the total amount of water that will be placed under contract including the irrigation requirements provided for in the legislation. Section 7 contains, in that respect, an admonition to the Secretary not to enter into contracts beyond such total amount as will in his judgment, in the event of shortage, leave a reasonable amount of water available to meet the diversion requirements of the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as provided in sections 2 and 6 of the bill.

Application of the principle, in terms of procedures to be followed, is somewhat complicated. For this reason, the procedures to be followed and the steps to be taken, are hereinafter set forth in mathematical terms or formulas.

The evaporation factor E is here handled as a reduction to inflow. By this process water users above, below, and from Navajo Reservoir stand a share of the Navajo Reservoir evaporation loss. The principle could also apply if evaporation was considered as an addition to, or part of, total demand. In this latter event, it would be necessary to assign a share of the evaporation loss to the group of contractors above Navajo and to the group below such that $D_a + D_b$ would continue to equal D, even though D contained the evaporation factor E.

The results of the two methods could be the same by appropriate assignment of the evaporation factor E. For simplicity, however, the first described method has been adopted herein. Evaporation cannot here be considered a reduction in available water stored in Navajo Reservoir as to do this would require only those users from or below Navajo to stand the evaporation loss.

In those years in which a shortage is anticipated, or has been determined to exist under the terms of section 7, it will be necessary to make at least monthly estimates of inflow and storage content, with corresponding adjustments if needed in apportioned supply.

Definitions of the symbols used in the formulas are as follows:

R=Available water stored in Navajo Reservoir.

E=Estimated evaporation for year concerned.

I=Anticipated or forecasted inflow (minus uses not subject to sharing) into Navajo Reservoir for year concerned. ($I=I_a+I_b$)

I_a=Available runoff (inflow) apportioned to the group of contractors above Navajo Reservoir.

I_b=Available runoff (inflow) apportioned to the group of contractors below Navajo Reservoir.

I_p=Available runoff physically available at point of contractor's diversion.

D=Total normal diversion requirements of all contractors. ($D=D_a+D_b$)

D_a=Total normal diversion requirements of the group of contractors above Navajo Reservoir.

$D_{b1,2,3,}$ etc.=Normal diversion requirement of respective contractors diverting above Navajo Reservoir.

D_b=Total normal diversion requirements of group of contractors diverting from or below Navajo Reservoir.

$D_{b1,2,3,}$ etc.=Normal diversion requirements of respective contractors diverting from or below Navajo Reservoir.

Step 1. Determination of water shortage

"Such contracts shall make provision, in any year in which the Secretary anticipates a shortage taking into account both the prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for sharing available water. * * *"

A water shortage is determined to exist when the available water stored in Navajo Reservoir (R) and the anticipated or forecasted inflow into the reservoir (I) is less than the total normal diversion demand of all contractors, or

$$R+(I-E)<D$$

Step 2. Apportionment of available water supply between contractors above and those at or below Navajo Reservoir

In the event it is determined by step 1 that a water shortage exists, the prospective runoff, the right to which the United States is entitled as defined in the proposed amendment to section 7, would be "apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each group bears to the total of all normal diversion requirements," or

The share of available inflow for the group of contractors above Navajo Reservoir (I_a), is

$$\frac{D_a}{D}\times(I-E)$$

The share of available inflow for the group of contractors below Navajo Reservoir, (I_b), is

$$\frac{D_b}{D}\times(I-E)$$

Step 3. Sharing of available runoff apportioned to contractors above Navajo Reservoir

"In the case of contractors diverting above Navajo Reservoir, each such contract shall provide for a sharing of the runoff apportioned to the said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts," or

$$\frac{D_{a1}}{D_a}\times I_a,$$

$$\frac{D_{a2}}{D_a}\times I_a,$$

and so forth, for each of those contractors.

Step 4. Reapportionment when water apportioned is in excess of runoff available to contractor above Navajo Reservoir

"Provided, That for any year in which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of his diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to that group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the same proportion that the normal diversion requirement of each bears to the total normal diversion requirements of the group."

Actually, the manner of handling this provision will depend upon physical factors of amount of diversion and respective locations of points of diversion of contractors to each other. In general, the provision would be accomplished in the following manner when the procedure of step 3 results in apportioning more water to contractor (D_{a1}) than is physically available at his point of diversion:

$$D_{a1}=I_p$$

$$\frac{D_{a2}}{D_a-D_{a1}}\times(I_a-I_p)$$

$$\frac{D_{a3}}{D_a-D_{a1}}\times(I_a-I_p), \text{ and so forth,}$$

Step 5. Sharing of remaining available runoff and available stored waters among contractors at or below Navajo Reservoir

"In the case of contractors diverting from or below Navajo Reservoir each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts," or

$$\frac{D_{b1}}{D_b}\times(I_b+R)$$

$$\frac{D_{b2}}{D_b}\times(I_b+R)$$

$$\frac{D_{b3}}{D_b}\times(I_b+R),$$

and so forth for each of those contractors

CONCLUSION

Application of the principle of sharing available water has been studied by State officials. The State's study covered the period 1928–54 and included a

diversion demand of some 224,000 acre-feet of water for potential municipal and industrial purposes as well as the presently authorized and contemplated developments. The study showed shortages in only 4 years which averaged about 3 percent for the total period. An extension of the State's study through 1957 resulted in an average shortage of about 6 percent for the total extended period. (Interior—Duplicating Section, Washington, D.C.)

Mr. ASPINALL. Any other questions?

(No response.)

Mr. ASPINALL. Thank you very much, gentlemen.

STATEMENT OF GLENN L. EMMONS, COMMISSIONER OF INDIAN AFFAIRS, DEPARTMENT OF THE INTERIOR, ACCOMPANIED BY G. P. KEESEE, LAND OPERATIONS BRANCH, BUREAU OF INDIAN AFFAIRS

Mr. ASPINALL. At this time the Chair will ask the Honorable Glenn Emmons, Commissioner of Indian Affairs, to come to the witness table. As I understand it, Mr. Emmons will be accompanied by Mr. G. P. Keesee, Land Operations Branch, Bureau of Indian Affairs. Is that correct?

Mr. EMMONS. Yes, sir.

Mr. ASPINALL. We welcome you here once again.

Mr. HALEY. Mr. Chairman, I should like just to say at this particular time that I have enjoyed the work and the cooperation of the gentleman who is now about to testify, Mr. Glenn L. Emmons. I am probably a little hard to get along with sometimes, but I have found, Mr. Chairman and members of this committee, that insofar as Mr. Emmons and his department are concerned, I have had 100 percent cooperation. I want to thank him publicly for that cooperation. I think he has performed outstandingly in a job which, as he knows, is very time consuming and has many very difficult problems.

I want to commend you, sir, for the outstanding record you have made here in behalf of the Indians of this country, and for the splendid service you have rendered not only to them but to the people of this Nation of ours.

Mr. EMMONS. I appreciate that more than I can tell you, Mr. Congressman.

Mr. Chairman, I wish also deeply to endorse the fine comments you have made about Congressman Haley. I have found that Congressman Haley in his position as chairman of the Subcommittee on Indian Affairs, with his tremendous interest in Indian affairs and his devotion to his duties in that position, has given me strength and courage to proceed on this job. I just want to make that a matter of public record, too.

Mr. Chairman and members of the committee, my purpose in coming before you here today is to give you my views both as Commissioner of Indian Affairs and as a longtime friend of the Navajo people, concerning the proposed Navajo Indian irrigation project which you have under consideration.

Although I have known the Navajo people and their problems rather intimately since 1919, the proposal to develop a large irrigable area south of the San Juan River predates me quite a bit. In fact, it goes back to the early years of the present century. During this whole period the people of northwestern New Mexico, both Indian and non-

Indian, have been waiting, sometimes patiently and sometimes eagerly, for this great development to become a reality.

The feasibility report on the Navajo irrigation project of January 1955 and the supplemental report of March 1957 were prepared by the Bureau of Indian Affairs. Subsequently these reports were coordinated with those prepared by the Bureau of Reclamation on the San Juan-Chama project. The status of this coordination has been presented in some detail by the spokesman for the Bureau of Reclamation. I would just like to say at this point that the coordinated development of these two projects would materially benefit the Indians both on the Navajo Reservation and on the pueblos in the Rio Grande Basin.

Other witnesses who are present here are better qualified than I am to testify on the economic and engineering aspects of this proposal for the Navajo Indian irrigation project.

Mr. Gary Keesee, the expert on the engineering phases, will present, I hope, all the technical answers.

My primary aim will be to bring out some of the nontechnical considerations which I believe are fundamentally important. More specifically, I want to emphasize how tremendously desirable I think this project would be in terms of the future welfare of the Navajo Indian people.

First, I would like to put the Navajo project in the framework of the total program to help the Navajo people in solving their more urgent problems. Notwithstanding the recent large increase in tribal income mostly from oil and gas leasing, there is still a great deal of poverty among the Navajo people today. In my opinion, this continuing poverty is primarily a result of the lack of balance between the rapidly increasing Navajo population and the resources upon which these people depend for support. As the population has expanded—it has multiplied about nine times since 1868 when the Navajos were released from Fort Sumner—the basic standard of living has declined. This central problem was recognized by the Interior Department report of March 1948, which led to the enactment of the Navajo-Hopi Rehabilitation Act of 1950. In that act there is a strong implication that construction of the Navajo Indian irrigation project could be of great benefit in any sound approach to a basic solution of the total Navajo problem.

The Interior Department's report of 1948 lays great stress on the project as a feature of Navajo economic rehabilitation. The act of 1950 provided an authorization of $9 million for reservation irrigation projects and for study of the Navajo Indian irrigation project.

The Congress in the enactment of Public Law 485, authorizing the Colorado River storage project, recognized the importance of the Navajo Indian irrigation project to the Navajo people by directing the Secretary of the Interior to give priority to the completion of a planning report on this project as well as other irrigation projects.

At this point, however, I want to emphasize that in dealing with the complex and many-sided problem of the Navajo people, we are not relying on any one line of approach. It is abundantly clear that only by a comprehensive and concerted program can we hope to make real progress. As you all know we have been emphasizing the fundamental importance of education in building a better future for the

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Navajo Tribe and we have made tremendous advances in this field over the years since 1953. Seven years ago only about 14,000 Navajo children—or roughly half of the school-age population of the tribe—were enrolled in school. Through the Navajo emergency education program of 1954–55 and other subsequent measures, we have steadily increased the enrollment until it now compares favorably with the national average. Last year the total enrollment of Navajo children from 6 through 18 years of age was 26,859 and the enrollment of Navajo youngsters of all ages was 28,106. In other words, we have provided educational opportunities for thousands of Navajo children who had never previously seen the inside of a classroom and we take a great deal of pride in this accomplishment. We are also emphasizing adult vocational training and helping in the relocation of those who want to move off the reservation in search of better job opportunities. We are, in every possible way, encouraging the development of industry in nearby communities and thus opening the way to increased Navajo employment in the immediate area. Emphasis is also being given by the Public Health Service to preventive medicine and by the Bureau of Indian Affairs to conservation and development of resources.

The Navajo irrigation project could be an extremely beneficial supplement to these constructive programs we now have underway. Just as one example, I might mention the study made by the city of Gallup regarding the possibilities of obtaining a more adequate supply of water for domestic and industrial use from the Navajo Reservoir. The plan calls for taking water from the main canal of the project at a point 45 miles north of Gallup and piping it into the city along the route of U.S. Highway No. 666. If this plan is carried through, a dependable source of domestic water could be made available along the route of the proposed line to several small Indian communities and four public school installations where Indian children are being educated. And the city itself would be placed in a much stronger position to attract new industries which would be greatly beneficial both to Indian and non-Indian people of the area.

Apart from this collateral possibility, the irrigation development would bring many benefits to the Navajo tribal population. If we are abel to place 1,000 Navajo families on the proposed project, we can foresee several primary and secondary results. Another 2,200 families would find employment in service and other related project activities. This means that a total of approximately 17,000 Navajo men, women, and children, in addition to 2,000 non-Indians, would be direct beneficiaries of the project. The indirect benefits would be even more far reaching.

Present pressure of overuse of the Navajo Reservation range would be substantially relieved. Schools for this population, farmers and nonfarmers alike, could be built on a day school basis. Every social service, to which the Navajos located on or near the project are entitled, could be more efficiently and economically administered. I foresee that the Navajo irrigation project would have profound, far-reaching, permanent, and expanding influence in helping the tribe find economic stability.

The Navajo Tribe, as you know, is the largest in the country. Its problems, as a whole, represent the largest single complex of Indian problems with which the Congress and the Bureau have to deal. We

have all been acutely aware of this fact since the great blizzard of the late 1940's which swept the Navajo onto the front page of the national press. National interest in the Navajo has remained constant, as I can well attest, since I came to Washington in 1953.

If with the assured support of the Navajo people themselves, we can set this fine group of people on the road to economic self-sufficiency, we will be meeting the expressed wishes of the American people. In this task, as I have said, the construction of the Navajo irrigation project could be tremendously beneficial.

I urge you to consider the factor of cost in a broad framework. I do not know how many millions of dollars have been spent over the years, not only in meeting the basic human needs of Navajoland, but in providing the essential services of welfare and administration. I do know the total sum expended by the Federal Government must have run to a gigantic figure. However, there is more involved here than cost. There is also the human need of the Navajo people. The Navajos have lands aggregating 16 million acres; yet the astounding fact is that out of all the vast territory, only 21,500 acres can be hazardously dry-farmed. Apart from the Navajo project, there is only a total irrigable acreage of 58,900 acres, of which 36,600 acres are actually irrigated on some 73 projects ranging in size from 20 to 6,500 acres. Of these projects only nine have an assured water supply either from storage or perennial flowing streams or springs. The remainder receive their supply by diverting the intermittent flows resulting from normal rainfall.

One important question that needs to be faced, of course, is whether the Navajo people can and will farm the land productively once it is developed. For an answer, we have two things to go on; our past experience and the training in irrigation farming techniques which are now being provided to individual tribal members.

Let me mention first our past experience.

As you fly into Farmington, N. Mex., after passing over the dry, eroded area to the south, you see a ribbon of green all along the San Juan River. This, in other words, is a prosperous valley and was even before the recent coming of gas and oil development, uranium mining and processing, and helium production in the area. Some Navajo Indians have had real experience with irrigation on the Fruitland and Hogback projects and are contributing substantially to the agricultural production of the valley.

The two Navajo Reservation irrigation projects on the San Juan—Fruitland, and Hogback—are producing annually more than $300,000 worth of crops from a total of about 7,600 acres. Both projects are seriously handicapped because of the small acreage allotted to the Navajo families, an average of 11 acres on the Fruitland and 7½ acres on the Hogback. The reason we have such farm acreage is because of decisions made years ago to crowd as many Navajo families as possible onto the land on a subsistence basis.

This scheme has not worked because the Navajo farmers have had to leave their farms to seek seasonal jobs off the reservation. Nevertheless, on the Fruitland project 93½ percent of the land was in use last year and only 6½ percent was idle. This compares with the usual experience of 10 percent idle land on public and private irrigation projects. On the Hogback project, the idle acreage was large, a little

over 20 percent, and this was due directly, I believe, to the limited size of the farm units.

If the Navajo irrigation project should be authorized, it would be possible for us to enlarge the farm units on these two existing projects. Our experience, however, in spite of the heavy handicap which I have indicated, proves that the Navajo Indian can and will become an irrigation farmer, as he is now doing with more success than we could reasonably expect under the circumstances, raising alfalfa, corn, beans, small grains, fruit, and garden vegetables. The Navajo has a strong feeling for the land and its use, and I am wholly convinced that if he is given the opportunity and the training, he can be successful in irrigation farming.

As far as training is concerned, we are now in excellent position. Because of the unfortunate experience which some Navajos had as irrigation farmers on the Colorado River Reservation in western Arizona, the tribe decided several years ago to set up a training program for Navajos who are interested in irrigation farming.

I might say a fellow by the name of Ernest Moore, a Navajo, who for the past 5 years has been irrigating approximately 600 acres on the Colorado River Reservation, grossed $35,000 from his farming activity. This was just last year.

This program is financed wholly from tribal funds and supervised entirely by tribal personnel. Ten Navajos who have completed their training under the program were placed within the past year on economic farm units of the Hogback project and 10 more will be placed this year. If the Navajo project should be authorized, we feel confident that the tribe would want to seriously consider a substantial enlargement of these training operations. In fact, I believe the Navajo Tribe has presently invested in this project about $650,000, is that correct?

Mr. KEESEE. That is correct.

Mr. EMMONS. In addition, of course, the Bureau is now providing and will continue to provide a less intensive but far more widespread kind of agricultural training through our schools, our extension activities, and our adult education classes.

Finally, I would like to mention the possibilities for future economic development which I can visualize in the entire San Juan Valley area above Shiprock. It promises to become one of the really well-balanced economic areas of the Southwest from the standpoint of both industry and agriculture.

I have previously mentioned the successful irrigation farming by Navajo Indians utilizing the waters of the San Juan River. In recent years, we have seen the important development of gas deposits. We have seen the area intimately linked with the uranium processing mill and testing plant and the reactivation of the helium processing plant at Shiprock. We know that private industry is working toward the development of the great coal deposits near the area. Construction of homes has kept abreast of the growing population. The Navajo Tribe built a modern motel at Shiprock; it is full every night and has been enlarged. We have seen the town of Farmington grow from 3,600 to 22,500 in the past 8 years.

The area is richly endowed. It is coming into its own. It has natural energy in its coal and gas resources. It has manpower in its Navajo people. It has water in the San Juan River.

The Navajo irrigation project, if built, would give vast and growing impetus to the whole economic life of northwestern New Mexico.

For centuries, the Navajos have lived along the San Juan River. To them, it is "our river," yet they have been most reasonable and practical in recognizing the needs of the Rio Grande Valley, and they have shown a willingness to work cooperatively with the State of New Mexico in developing a broad plan for the use of the waters of the San Juan River.

The decision is in the hands of Congress. In these remarks, I have emphasized the important contribution which the Navajo Indian irrigation project could make toward the creation of greater economic stability in the Navajo area; the past experience of Navajos in irrigation farming in the San Juan Valley; the plans for training and preparing Navajos for resettlement; and the developing economy of the entire San Juan Valley, which could benefit most effectively from construction of the project. I earnestly hope that all these matters will have your most thoughtful consideration.

I thank you for this opportunity to appear before you, Mr. Chairman.

Mr. ASPINALL. Thank you, Mr. Commissioner.

Is it your intention to be back here this afternoon or do you have other business which you have to take care of?

Mr. EMMONS. I will be glad to be here.

Mr. ASPINALL. The gentleman from Florida?

Mr. HALEY. I have no questions, Mr. Chairman.

Again, I just want to thank the Commissioner of Indian Affairs for his fine statement to the committee this morning.

I think it is very plain, much to the point, and he has indicated in the statement his continued interest in the Indian problems of our country. I want to thank him.

Mr. ASPINALL. The gentleman from Colorado?

Mr. CHENOWETH. Mr. Chairman, I am not going to take the time of the committee to ask questions but I also want to welcome Mr. Emmons. Although I am not a member of the Subcommittee on Indian Affairs, I was very happy to hear the chairman of the subcommittee make the complimentary remarks about Mr. Emmons this morning.

I am sure that those remarks are concurred in by everyone who has had any contact with him.

Mr. EMMONS. Thank you.

Mr. CHENOWETH. I congratulate Mr. Emmons on the job he has done. You made a very fine statement this morning and a very impressive one.

You are certainly doing everything that you can to help the Navajo Indians, and I commend you on this effort.

That is all.

Mr. EMMONS. Thank you.

Mr. ASPINALL. The gentleman from California?

Mr. SAUND. Thank you, Mr. Chairman.

I also wish to express my appreciation for the fine cooperation which I have received from the Bureau of Indian Affairs.

Mr. EMMONS. Thank you.

Mr. ASPINALL. The gentleman from New Mexico?

Mr. MORRIS. I want to compliment the Commissioner of Indian Affairs on his very fine statement this morning before the committee.

Mr. ASPINALL. May the acting chairman state that he wishes to join with his chairman of the subcommittee on Indian Affairs and compliment and commend the Commissioner and his staff.

You have sent up before us, Mr. Commissioner, two of the very finest men we have had before us; Mr. Rex Lee and Mr. Louis Zigler. We appreciate having them up here.

You have a very difficult responsibility and I am sure that all of us appreciate the work that you are doing.

You understand, do you not, Mr. Commissioner, that the Navajo participating project in effect is really an Indian project separate and apart from the Colorado River storage and development program? It is not related to the Colorado River storage and development program as far as benefits and financing are concerned; is that correct?

Mr. EMMONS. Yes, sir.

Mr. ASPINALL. It is part of the whole operation of the upper Colorado River storage and development program because the Navajo Dam and Reservoir, which is being provided at the present time, is a necessary for the water supply of the Navajo participating project. When the legislation is finally drafted and passed out of the committee, would it make any difference to you if we had title I for the San Juan-Chama and title II for the Navajo irrigation project?

Is that a technical question?

Mr. EMMONS. Mr. Chairman, may I just make one remark?

I think that you all realize, and I know that you know because you have given us wonderful support on our various programs, but we are committed naturally to develop all Indian lands to provide the maximum benefit to the Indian people; that is, to develop the resources that will raise the standards of living of the Indian people to the level of the non-Indian neighbors.

We do know that developing all of the resources on most reservations in the country is not going to solve the pressure on the Indian land and that is the reason we have the voluntary relocation program, the adult vocational training program and all of these other things.

We also have our industrialization program in order to provide jobs for those Indians who cannot and will not use the land.

The Rio Grande Valley does offer tremendous oportunities for employment of our Indian people and the more industries that are developed, I would say, in the Albuquerque area and elsewhere in the Rio Grande Valley, the more opportunities for our Indian people.

I think it is pretty well tied together on that basis.

Mr. ASPINALL. You are not telling us, Mr. Commissioner, that the Navajo participating project is a part of the operations of the Rio Grande Valley?

Mr. EMMONS. No, sir; but I just merely want to show the effects that this could have, the good effects, on the Navajos.

Mr. ASPINALL. We admit that. We admit that, but what I wanted distinctly understood is that the Navajo participating project is an Indian project from now on and must be treated as an Indian project and that it is separate and apart, although related, as far as the Indian benefits are concerned, but it is separate and apart from the upper Colorado River storage and development program.

Mr. EMMONS. Yes, sir. That is right.

Mr. ASPINALL. I have read Mr. Keesee's statement and it is a good statement, a fine statement.

We do want to see that this part of Navajo land and the New Mexico economy properly enhanced, but there is nothing to be returned to the Treasury of the United States as long as this land remains in ownership; is there?

Mr. EMMONS. No, sir.

Mr. ASPINALL. Only a very small part would ever be returned to the United States even if the Indian users or those who would take from the Indian users would later on have to pay a part of construction costs. It is a very small percentage, about 12 percent as a matter of fact. Those funds would not go to Reclamation but back to the General Treasury of the United States. They would not go to the upper Colorado River Basin fund; is that right, Mr. Keesee?

Mr. KEESEE. That is right.

Mr. ASPINALL. We will recess at this time until 1:30 at which time we will have Mr. Keesee before the committee. Then we will proceed to try to close these hearings this afternoon.

The hearing has been very informative so far and thank you, gentlemen.

Mr. EMMONS. Thank you very much, Mr. Chairman.

AFTERNOON SESSION

Mr. ROGERS. The Subcommittee on Irrigation and Reclamation will come to order for further consideration of pending business. The chairman will recognize Mr. Keesee of the Land Operations Branch of the Bureau of Indian Affairs. Please come forward and identify yourself for the record.

STATEMENT OF G. B. KEESEE, SUPERVISORY GENERAL ENGINEER, BRANCH OF LAND OPERATIONS, BUREAU OF INDIAN AFFAIRS

Mr. KEESEE. Mr. Chairman, I have a prepared statement.

Mr. ROGERS. If you prefer, you may put the statement in the record and you can abbreviate it or just discuss it generally.

Mr. KEESEE. I can probably discuss it just as easily from the map.

Mr. ROGERS. Without objection, the statement will be included in the record, together with all attachments. You may proceed to discuss it as you desire, Mr. Keesee.

(Mr. Keesee's prepared statement follows:)

STATEMENT OF G. B. KEESEE, SUPERVISORY GENERAL ENGINEER, BRANCH OF LAND OPERATIONS, WASHINGTON

The Navajo Indian irrigation project in northwestern New Mexico is situated on an elevated plain south of the San Juan River in San Juan County. The lands proposed for irrigation are located primarily in two large areas. On tract containing a net irrigable area of 48,289 acres is located east of the Chaco Wash and extending eastward for a distance of approximately 36 miles and southward from the San Juan River for approximately 18 miles. The other tract containing a net irrigable area of 62,341 acres is located west of the Chaco Wash and entered around the village of Newcomb, approximately 40 miles south of the village of Shiprock and is approximately 30 miles in length in a north-south direction and 14 miles in an east-west direction.

The total net project area as now proposed is 110,630 acres, and is 26,620 acres less than the net area proposed in the 1955 feasibility report. This reduction is due to several factors:

(1) A policy decision by the State of New Mexico as to the location of lands to be developed for non-Indian farmers.

(2) An agreement between the Navajo Tribe, Bureau of Indian Affairs, and the State of New Mexico that the Navajo Indian irrigation project would be built solely for settlement and use by the Navajo Indians and would contain a net irrigable area of not less than 110,630 acres of land, requiring annually at the point of diversion not more than 508,000 acre-feet of water.

(3) That the Federal and State lands located eastward from the east boundary of the Navajo Reservation and within the limits of the project boundary, subject to irrigation from the main gravity canal, be included as part of the Navajo Indian irrigation project.

(4) Because of the State's policy in respect to the development of other lands for non-Indian use, it permitted the exclusion from the originally proposed project area all of those lands situated in long narrow valleys requiring long and costly lateral canals to provide them with water and resulting in a more compact body of land west of the Chaco Wash which would reduce the construction costs and make for more economical operation and maintenance of the project.

The project lands located on the Navajo Reservation are presently used by individual Navajo Indians under assignment from the tribe for grazing purposes, and those project lands located outside the boundary of the reservation are used by Navajo Indian allottees and private ranchers for the same purpose. The productive capacity of the proposed project, under present use of the lands proposed for irrigation, support 5,116 sheep units year long. The same lands, under irrigation would support under average managerial efficiency, about 436,000 sheep units year long.

The construction of the Navajo Indian irrigation project would provide a means of self-support for 1,120 families on farm units and would create employment for an additional 2,240 families. Thus, the Navajo Indian irrigation project would provide a substantial living for about 17,000 people of the present Navajo population.

The project lands range in elevations from 5,580 to 5,950 feet and lie from 200 to 500 feet above the entrenched river. The project area has a temperate and semiarid climate. The summers are characterized by warm days and cool nights. The mean average annual temperature is about 51° F. varying from a minimum of —21° F. to a maximum of 110° F. The frost-free period is about 160 days.

The average annual precipitation varies from 8.99 inches at the Bloomfield station to 7.5 inches at the Shiprock station. About half of the rainfall occurs during the growing season making irrigation necessary for successful crop production. Winds are common in the spring and fall, but seldom of violent magnitude.

Only those lands in the class I and II categories will be developed for irrigation. There are a total of 31,921 acres of class I land and 30,420 acres of class II land to be developed for irrigation farming in the area west of the Chaco Wash and 8,038 acres of class I land and 40,251 acres of class II land in the area east of the Chaco Wash. Drainage investigations do not indicate that unfavorable drainage problems will develop during the operation of the project. With irrigation, the project lands are well suited for the raising of the types of crops normally grown on irrigated lands in the San Juan River Basin. The soils contain a low content of salt which will not interfere with plant growth.

Water for the irrigation of the project lands will be supplied out of New Mexico's share of the Colorado River water. The water will be stored in the Navajo Reservoir, presently under construction, one of the storage reservoirs of the Colorado River storage project authorized by Public Law 485 (84th Cong., 2d sess., approved April 11, 1956). The project's water requirements will be diverted from the Navajo Reservoir near Navajo Dam. Reservoir operation studies of the Navajo Reservoir indicate that sufficient water will be available for a full project supply with reasonable annual shortages. Details of the water supply aspects for this project and the initial stage of the San Juan-Chama project will be covered by Bureau of Reclamation.

The agreement as discussed in the second paragraph of this statement involving the project size and use of the project lands resulted in a revision of

the project works west of Kutz Canyon pumping plant proposed in the January 1955 report. The location of the main gravity canal from Navajo Dam to the inlet of the Kutz Canyon pumping plant remains approximately in the same position as originally proposed. The maximum capacity of the canal was reduced from 2,630 cubic feet per second to 2,405 cubic feet per second. The water for the project will be diverted from the Navajo Reservoir at elevation 5,990 feet as originally proposed.

The Kutz Canyon pumping plant is eliminated in the present plan and replaced with a siphon crossing Kutz Canyon, and the main gravity canal continues across the project area 170 feet higher in elevation than the original Shiprock main gravity canal. At a distance of 75.6 miles from the main gravity canal heading, the water required for serving project lands west of Chaco Wash will be dropped through the Gallegos powerplant. The remaining 77 miles of the main gravity canal is located as originally proposed in the 1955 report.

A maximum of 15,000 kilowatts of power will be generated at the Gallegos powerplant only during the irrigation season and will be used solely to operate the Gallegos, Newcomb, and Bennett Peak pumping plants, supplying water to three subareas above the gravity main canal on the Navajo Reservation. The turbines will operate under 172.5 feet of head and be designed to generate the power required during the irrigating season. A maximum of 1,150 cubic feet per second water is available to generate the maximum power requirements.

The Gallegos pumping plant will be located on the main gravity canal at the east reservation boundary line and will supply water to a net area of 9,273 acres. The Newcomb pumping plant located approximately 4 miles south of the village of Newcomb will supply water from the main canal to a net area of 6,688 acres located west of U.S. Highway 666. The Bennett Peak pumping plant located approximately 7 miles north of the village of Newcomb will supply water from the main canal to a net area of 12,940 acres located west of U.S. Highway 666.

The total length of each section of the main gravity canal, the total length of canal, total length of tunnels, total length of siphons, and the initial capacity of each section are shown in table I.

TABLE I

Canal section	Total length, miles	Open canal, miles	Tunnels, miles	Siphons, miles	Initial capacity, cubic feet per second
Dam to Kutz Canyon	29.3	13.6	10.1	5.6	2,405
Kutz Canyon to Gallegos powerplant	46.3	38.4	2.7	5.2	1,973
Gallegos powerplant to end	77.0	67.2	----------	9.8	1,150
Total	152.6	119.2	12.8	20.6	----------

The static head and quantity of water to be pumped for each of the pumping plants are shown in table II.

TABLE II

Pumping plant	Static head, feet	Quantity cubic feet per second
Gallegos	214	156
Newcomb	170	130
Bennett Peak	170	252

The estimated total cost of building the works to serve the Navajo Indian irrigation project based on present prices is $134,359,000 and is $25,000,000 or 15.7 percent less than the plan proposed in the 1955 report. The total estimated cost does not include $974,000 of prior investigation costs, nor are any of the costs of the Navajo Dam and Reservoir included.

A period of 14 years is required to complete the Navajo Indian irrigation project of which the first 2 years after authorization would be used to develop the definite plan and other preconstruction activities and the remaining 12 years for the building of the project works. The delivery of water to the first of the project lands could be accomplished within 5 years.

The project is adaptable to serve municipal and industrial water users as well as its primary purpose of irrigation. The preceding costs are for works to serve irrigation requirements only. The following analysis considers those benefits associated with construction of the irrigation works.

The project would produce four types of measurable benefits. Three of these are: Direct benefits—the increased net farm income resulting from irrigation; indirect—the benefits derived from secondary use of the project products; and public—the benefits resulting from increased or improved settlement, employment and investment opportunities, community and service facilities, and the stabilization of local and regional economy. The fourth type of benefit is peculiar to only a project concerned with the Indian people. This benefit measures the reduction in cost to the U.S. Government in fulfilling its obligation to provide schools for Navajo children.

Direct, indirect, and public benefits were computed by standard procedures adopted by the Department of the Interior. They are based on the price index of 250 for prices received, 265 for prices paid and the period 1910–14 equals 100. Education reduction cost benefits were determined through an analysis of past schooling costs and a prediction of conditions with the Navajo project in operation. The benefits are summarized below:

Type of benefit:	*Annual amount*
Direct	$3,365,400
Indirect	3,019,900
Public	1,194,000
Subtotal irrigation benefits	7,579,300
Education cost reduction	957,600
Total	8,536,900

Benefit-cost ratios were computed for both a 50-year and 100-year period of analysis. In these computations interest during construction was computed at 2½ percent per annum during the 12-year construction period and total Federal costs were amortized over the 50- and 100-year periods at the rate of 2½ percent interest. These procedures are consistent with current practices in the analysis of reclamation projects. The benefit-cost ratios for the project would be:

100-year period of analysis

Direct irrigation benefits	0.64:1
Total irrigation benefits	1.44:1
Total irrigation and school benefits	1.62:1

50-year period analysis

Direct irrigation benefits	0.52:1
Total irrigation benefits	1.17:1
Total irrigation and school benefits	1.31:1

A more complete derivation of the benefit-cost ratio is given as attachment A.

A total of 1,120 new farms would come into existence as a result of project construction. Farm budget analysis for typical 90-acre farms on class I lands and 105-acre farms on class II lands determined the per-acre repayment ability to be $9.25 for class I lands and $7.50 for class II lands. Deduction of operation, maintenance, and replacement charges of $4.35 per acre per year results in amortization capacities of $4.90 and $3.15 per acre per year for class I and class II lands respectively. This computation is presented in table III.

TABLE III.—*Repayment capacity of project lands*

Item	Class I land	Class II land
Annual payment capacity per acre	$9.25	$7.50
Annual O.M. & R. charges per acre	4.35	4.35
Annual amortization capacity per acre	4.90	3.15
Maximum annual repayment	418,400.00	
Maximum repayment, 50 years	20,920,000.00	

Project farm operators would pay annual operation, maintenance, and replacement assessments. In addition, the operators would have the capability

of repaying $418,400 annually or $20,920,000 during a 50-year period toward the construction costs of the projects. This amounts to about 16 percent of the construction costs. Under Public Law 485 (84th Cong., 2d sess., approved April 1, 1956) costs within the capability of the land to repay is subject to the act of July 1, 1932 (47 Stat. 564) and is not subject to collection as long as the land remains in Indian ownership. Costs in excess of repayment ability would be nonreimbursable.

TABLE IV.—*Summary of data, Navajo irrigation project, New Mexico*

Net irrigated acreage, 110,630 acres.	
Principal anticipated agricultural production: Alfalfa, pasture, small grains, sheep, and dairy cows.	
Irrigation water supply:	
Average annual diversion, 508,000 acre-feet.	
Average annual stream depletion, 281,000 acre-feet.	
Project works:	
Main canal, initial capacity 2,405 cubic feet per second.	
Main canal, 152.6 miles long, including 119.2 miles open canal, 12.8 miles tunnel, and 20.6 siphon.	
Gallegos, Newcomb, and Bennett Peak pumping plants: Gallegos powerplant; laterals; distribution; and drains. About 14 years would be required for construction of the project.	
Estimated construction cost	$134,359,100
Repayment ability of water users, 50 years	20,920,000
Costs in excess of water users repayment ability	113,439,100
Annual operation, maintenance, and replacement costs	481,200
Benefit-cost ratios:	
100-year period of analysis:	
Direct benefits	0.64–1.0
Total irrigation benefits	1.44–1.0
Total irrigation and education benefits	1.62–1.0
50-year period of analysis:	
Direct benefits	.52–1.0
Total irrigation benefits	1.17–1.0
Total irrigation and education benefits	1.31–1.0

Benefit-cost ratio (100-year analysis)

Total costs:[1]	
Total field costs	$111,082,000
Plus 12 percent for contingencies	124,415,000
Plus 8 percent for engineering and overhead[2]	134,359,100
Total cost plus 2½ percent interest during construction	154,513,000
Annual equivalent costs:	
2½ percent over 100 years (0.02731)	4,220,000
O.M. & R. at $4.35 per acre	481,200
Colorado River depletion charge at $2 per acre-foot	563,600
Total	5,264,800
Benefits:	
Direct irrigation, at 30.42	3,365,400
Total irrigation, at 68.51	7,579,300
Educational cost reduction	957,600
Total irrigation and educational cost reduction	8,536,900
Benefit-cost ratio:	
Direct irrigation benefits	0.64–1.0
Total irrigation benefits	1.44–1.0
Total irrigation and school benefits	1.62–1.0

[1] Does not include cost of dam and reservoir.
[2] Does not include prior investigation costs of $974,000.

Benefit-cost ratio (50-year analysis)

Total costs:[1]	
Total field costs	$111,082,000
Plus 12 percent for contingencies	124,415,600
Plus 8 percent for engineering and overhead[2]	134,359,100
Total cost plus 2½ percent interest during construction	154,513,000
Annual equivalent costs:	
2½ percent over 50 years (0.02731)	5,448,100
O.M. & R., at $4.35 per acre	481,200
Colorado River depletion charge, at $2 per acre-foot	563,600
Total	6,492,900
Benefits:	
Direct irrigation, at 30.42	3,365,400
Total irrigation, at 68.51	7,579,300
Educational cost reduction	957,600
Total irrigation and educational cost reduction	8,536,900
Benefit-cost ratio:	
Direct irrigation benefits	0.52 to 1.0
Total irrigation benefits	1.17 to 1.0
Total irrigation and school benefits	1.31 to 1.0

[1] Does not include cost of dam and reservoir.
[2] Does not include prior investigation costs of $947,000.

Mr. KEESEE. The total project has a net area of 110,630 acres and is 26,620 acres less than the net area proposed in the 1955 feasibility report. This reduction is due to several factors:

(1) A policy decision by the State of New Mexico as to the location of lands to be developed for non-Indian farmers.

(2) An agreement between the Navajo Tribe, Bureau of Indian Affairs and the State of New Mexico that the Navajo Indian irrigation project would be built solely for settlement and use by the Navajo Indians and would contain a net irrigable area of not less than 110,630 acres of land, requiring annually at the point of diversion not more than 508,000 acre-feet of water.

(3) That the Federal and State lands located eastward from the east boundary of the Navajo Reservation and within the limits of the project boundary, subject to irrigation from the main gravity canal, be included as part of the Navajo Indian irrigation project. This was formerly non-Indian development.

(4) Because of the State's policy in respect to the development of other lands for non-Indian use, it permitted the exclusion from the originally proposed project area all of those lands situated in long narrow valleys requiring long and costly lateral canals to provide them with water and resulting in a more compact body of land—by including this area here we are able to eliminate the lands along the west side, northwest corner of our project, and lands in here and that gave us a body in here in the southern part, southwestern part, and in the central. We come up with a much better project. These lands would be served from the Navajo Dam through the main canal traversing across the project to a point near the Chaco Wash where we drop the water 175 feet to provide seasonal power to pump to the lands shown in cross-hatched areas here. This gives us the net.

The Utah Coal Co. lease that perhaps Mr. Jones will bring, that lies right through here and eliminates only a small acreage.

Perhaps if you would ask questions, I could answer them easier.

Mr. ROGERS. Mr. Aspinall.

Mr. ASPINALL. I have nothing on this particular matter. I understand this is not all of your presentation. I have two or three questions to ask if you are going to let your presentation go as it is. I can ask you questions on the whole statement.

Mr. KEESEE. If you put it in the record——

Mr. ASPINALL. It is already in the record. The questions I have are these. First is a question relative to the Gallegos powerplant with its relationship to the Gallegos, Newcomb, and Bennett Peak pumping plants. Where are these to be located?

Mr. KEESEE. The powerplants are here.

Mr. ASPINALL. As I understand it, you have a 172½-foot drop.

Mr. KEESEE. Yes.

Mr. ASPINALL. Where does the water go that goes through the powerplant?

Mr. KEESEE. It follows along the main canal and serves this body of land at this point, and this body of land in here.

Mr. ASPINALL. Where is the Gallegos pumping plant located?

Mr. KEESEE. At the boundary line.

Mr. ASPINALL. Where does the water from the Gallegos pumping plant go and what is the raise that is necessary there?

Mr. KEESEE. I have it in the statement; 214 feet at that point.

Mr. ASPINALL. Where is the Newcomb?

Mr. KEESEE. Newcomb pumping plant is located here.

Mr. ASPINALL. Where is the Bennett?

Mr. KEESEE. At this point.

Mr. ASPINALL. Who will pay the cost of operation, maintenance, and replacement for the powerplant and the pumping plants?

Mr. KEESEE. That is included in the O. & M. charges.

Mr. ASPINALL. Will all O. & M. charges be paid annually by the Indians or will these charges be forgiven or deferred to some extent?

Mr. KEESEE. They are paid annually by the water users.

Mr. ASPINALL. The cost of the powerplant and the three pumping plants is a part of the cost of construction of this project, the Navajo participating project; is that right?

Mr. KEESEE. That is right. This plant is only a seasonal powerplant.

Mr. ASPINALL. You will operate just for pumping purposes?

Mr. KEESEE. Yes.

Mr. ASPINALL. Will the cost of production of power be figured as part of the O. & M. just the same as the costs of the pumping plants?

Mr. KEESEE. That is right.

Mr. ASPINALL. You state in your statement that there is $974,000 that has been expended so far in survey and engineering studies. Where did that money come from?

Mr. KEESEE. That was appropriated through the Bureau of Indian Affairs appropriations.

Mr. ASPINALL. I think that is all.

Mr. ROGERS. Mr. Morris.

Mr. MORRIS. Mr. Chairman, I would just like to commend Mr. Keesee. I might also point out to the committee that Mr. Keesee is the engineer who personally did the basic planning of this project.

He was stationed at Gallup, N. Mex., for many years and personally did the engineering work on this project. I have no questions.

Mr. ROGERS. Mr. Keesee, did you have anything further?

Mr. KEESEE. No, sir.

Mr. ASPINALL. Mr. Chairman, I have one or two more questions just to have the record clear.

The Leavitt Act would apply to this project; is that right?

Mr. KEESEE. Yes, sir.

Mr. ASPINALL. Those construction costs chargeable to Indian users would be deferred until the land changed into non-Indian ownership; is that correct?

Mr. KEESEE. That is correct.

Mr. ASPINALL. The other costs amount to in the neighborhood, I believe, of 88 percent?

Mr. KEESEE. Eighty-four percent.

Mr. ASPINALL. Eighty-four percent. That would be at the expense of the Federal Government as nonreimbursable funds; is that correct?

Mr. KEESEE. Yes, sir.

Mr. ASPINALL. That is all.

Mr. MORRIS. May I ask one more question, Mr. Chairman?

Mr. ROGERS. Mr. Morris.

Mr. MORRIS. Mr. Keesee, could you explain on page 7 what you mean by school benefits?

Mr. KEESEE. School benefits are the costs of sending those children, the saving in the costs of sending those children to boarding schools such as Intermountain and other places where they would have facilities there to take care of the children rather than facilities here. It is that saving to the Government in the difference in cost.

Mr. MORRIS. This would be savings in future appropriations if this project is authorized?

Mr. KEESEE. Yes, sir.

Mr. ROGERS. Thank you very much, Mr. Keesee.

In keeping with the announcement the Chair made this morning, the Chair will now recognize our colleague, Mr. Montoya, of New Mexico, the author of H.R. 2494, for such testimony as he cares to give.

STATEMENT OF HON. JOSEPH M. MONTOYA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW MEXICO

Mr. MONTOYA. Mr. Chairman, of the subcommittee, and Mr. Aspinall, chairman of the full committee, and my colleague, Mr. Morris, I certainly want to thank the committee for having scheduled hearings on what I consider to be this very important legislation. I think that is demonstrated by the fact that we have a tremendous delegation from New Mexico comprised of individuals who have looked forward to this day here in Washington. I do not want to belabor the committee or take of its time, but I do want to submit a statement which I have prepared in support of the legislation before the committee.

I want to thank the committee for the opportunity of appearing before it.

Mr. ROGERS. Mr. Montoya, it has already been worked out by unanimous consent that your statement would be included along with Mr. Morris' at the proper place in the record.

Let the Chair say at this time we are very glad to welcome you before it and observe both you and Mr. Morris have been most effective in the work you have done in Congress and especially in matters of this kind affecting the great State of New Mexico. We are deeply appreciative.

Mr. MONTOYA. Thank you.

Mr. ASPINALL. I would like to add my commendation to the work done by Mr. Montoya. Mr. Montoya works on a committee which does not get too much attention publicly and perhaps not too much publicity. It is very gratifying for those of us of the reclamation West, especially in the Rocky Mountain area, to know we have Mr. Montoya serving on the Committee on Appropriations. There are times when he would like to be other places, either on the floor or in other committee hearings, but it is absolutely impossible if he is to do his work as a member of that committee. So often it is not understood by people generally that these committee responsibilities are in fact much more important than any operation that is to be found elsewhere in Congress. A person who serves his committee diligently, industriously, and effectively is doing the biggest job that can be done by any Member of Congress.

Mr. MONTOYA. Thank you, Mr. Chairman.

Mr. ROGERS. The Chair is now going to recognize the group from New Mexico. I believe Mr. Reynolds and Mr. Coury are here. I am glad to see you, Mr. Coury.

STATEMENT OF I. J. COURY, CHAIRMAN, NEW MEXICO INTERSTATE STREAMS COMMISSION; ACCOMPANIED BY L. C. STRAWN, TUCUMCARI, N. MEX., AND PETER GALLAGHER, ALBUQUERQUE, N. MEX.

Mr. COURY. Mr. Chairman, I appear before the committee and would first like to say Gov. John Burroughs of New Mexico sends his regrets to the committee that he could not be here personally to deliver the message in person. He has asked me, as chairman of the Interstate Streams Commission, together with Mr. L. C. Strawn of Tucumcari and Peter Gallagher of Albuquerque, to present and read his statement to the committee.

Mr. ROGERS. Fine. You may proceed.

Mr. COURY. I am I. J. Coury, and I live at Farmington, N. Mex. I am chairman of the New Mexico Interstate Streams Commission. I appear before this committee to read the statement of the Honorable John Burroughs, Governor of the State of New Mexico, in behalf of H.R. 2352 and H.R. 3294.

Mr. ROGERS. Before you start, is it contemplated that you will make the full presentation for all of the area witnesses or are some of the other area witnesses desiring to appear?

Mr. COURY. I think there are other witnesses to appear.

Mr. ROGERS. The ones I am speaking of, of course Governor Burroughs is not here, but is Mr. Paul Jones present?

Mr. COURY. Yes, sir.

Mr. ROGERS. Mr. John Bliss?

Mr. COURY. Yes, sir.

Mr. ROGERS. Mr. Ed Beavers and Mr. Edmund L. Engel and Mr. John Patrick Murphy and Mr. Hubert Ball.

Mr. Coury, do you desire to read the Governor's statement or did you want to insert it in the record and discuss it?

Mr. COURY. If it is all right with the chairman, I would just as soon have it inserted in the record.

Mr. ROGERS. Without objection, the statement will be inserted in the record in full, and you may proceed to discuss it as you wish.

(Governor Burroughs' statement follows:)

STATEMENT OF JOHN BURROUGHS, GOVERNOR OF THE STATE OF NEW MEXICO

My name is John Burroughs. I am Governor of the State of New Mexico, appearing before you in behalf of H.R. 2352 and H.R. 2494, bills to authorize construction of the Navajo irrigation project in New Mexico and the initial stage of the San Juan-Chama transmountain diversion project in New Mexico and Colorado. The need for both projects has been clearly established. Both have been under general consideration for more than a quarter of a century, but it was not until after negotiation of the Upper Colorado River compact in 1948 that the State and Federal Governments were able to formulate specific plans for their construction.

More than 10 years ago the Secretary of the Interior recommended that Congress authorize a Navajo irrigation project to meet some of the obligations of the United States to the Navajo people. New Mexico agreed that such a project was needed and desired; however, the State was forced to point out that such a project would compete with other potential uses for a limited supply of water, and took the position that plans for all potential projects would have to be correlated before any of them could be authorized.

In order to expedite investigation of the problem and compilation of data upon which intelligent decisions concerning water allocations might be based, the Secretary of the Interior on August 30, 1950, created an Interagency Technical Committee composed of engineers of the Bureau of Reclamation and the Bureau of Indian Affairs. A representative of the New Mexico State engineer office attended all meetings of this Committee in an advisory capacity. The results of studies of this Committee were discussed at length with interested groups and agencies in both the San Juan and the Rio Grande Basins. By March 4, 1953, New Mexico had made certain decisions concerning the sizes of the various potential projects to be studied by the Department of the Interior. On that date, the State requested that the Secretary of the Interior undertake the project studies. It also recommended water use criteria for purposes of the studies. In the ensuing years much work has been done and many important decisions have been made in the course of bringing project plans to their present stage of planning or construction.

I have reviewed past events in some detail because I wish to emphasize that New Mexico, in cooperation with the Bureau of Reclamation, the Bureau of Indian Affairs, and the Navajo Tribe, has given a great deal of thought and work to the task of formulating a plan which provides for optimum development of future water uses in accordance with New Mexico's compact allocation. The plan set forth in H.R. 2352 and H.R. 2494 is the result of years of extremely careful and conscientious effort on the part of competent persons fully familiar with all details and ramifications of the problem. In my opinion, New Mexico residents of both the Rio Grande and San Juan Basins have displayed unusual wisdom, forbearance, and statesmanship throughout the long negotiations. I might add that, in so doing, they have successfully skirted the pitfalls which are inherent in any plan of water development where both in-basin and out-of-basin uses are involved.

The chronic economic distress of the Navajo people—most populous Indian tribe in the United States—has long been a matter of national concern. These people have suffered from privation almost continuously since their confinement to barren reservation lands in 1868. This has come about not from lack of industry—for as a people the Navajos are proud, independent, intelligent, and energetic—but from lack of opportunity.

Paul Jones, chairman of the Navajo Tribal Council, has said: "My people have new hope for the future. That hope depends largely on two things: education and water. Without both, we have little chance to enjoy the life believe we have

the right to expect * * *. We want only the chance to earn our own way and support ourselves."

The Navajo Tribe is counting heavily upon the irrigation project to provide some of its people an acceptable way of life. The Navajos have already proved their capabilities as farmers on the presently operating Hogback and Fruitland irrigation projects on the reservation. Also, the tribal council has initiated an on-the-farm training program for candidates for the new farms that will be created by the project. The candidates are selected carefully to insure that only those capable of succeeding at the enterprise will be placed on the farms.

The plight of the Navajo does not require lengthy discussion before this committee. Congress has already demonstrated its awareness of conditions on the reservation and of the national responsibility by authorizing Navajo Dam and appropriating funds for its construction, and particularly by providing in Public Law 485 that the costs of construction of the Navajo irrigation project which are beyond the ability of the lands to repay would be nonreimbursable. The costs which are within the capability of the land to repay would be subject to the provisions of the Leavitt Act of 1932.

The possibility of importing San Juan River water into the Rio Grande Valley for use in areas of deficient water supply has been under consideration by New Mexico for many years. Such a project requires construction of water storage and transportation facilities in Colorado for the benefit of users in New Mexico, but this requirement actually presents no problem. In article IX of the Rio Grande compact, which has been in effect since 1938, Colorado specifically consents to the diversion of waters from the San Juan River to the io Grande Valley. Colorado also assents to diversion and storage of water in the State of Colorado for use in the State of New Mexico in article XIV of the Upper Colorado River Basin compact.

The proposed legislation would authorize the construction of an initial-phase project for an average annual diversion of 110,000 acre-feet from the San Juan River to the Rio Grande, with tunnel and conduit works having sufficiently capacity for future diversion of an average of 235,000 acre-feet a year. The authority for the Secretary to construct the larger size conduit in the initial-stage project is essential to provide needed flexibility for future developments. We think it unnecessary and unwise to attempt to make final allocations of New Mexico's portion of San Juan River water at this time, but we seek construction in accordance with plans that will permit the economical development of additional water as needs arise on either side of the Continental Divide. Including tunnel and conduit capacity for future diversions in the initial st ge will greatly reduce the cost of potential future diversions to the Rio Grande Basin.

It is presently contemplated that about 57,000 acre-feet of the water imported by the San Juan-Chama project will be contracted for by the city of Albuquerque. Albuquerque is one of the fastest growing cities in the United States. The present population is estimated at 264,000 and it has been conservatively estimated that the population will exceed 750,000 by the year 2000. Large installations at Albuquerque play a key role in our program of research and development for national defense. An assured water supply is essential for the continuation and possible expansion of that program and to take care of the anticipated growth of Albuquerque as a trade, industrial, and recreation center in the Southwest.

Approximately 30,000-acre-feet per year of the imported water would be used on tributary irrigation units in the Rio Grande Basin in northern New Mexico. These irrigation units are desperately needed to stabilize and expand the agricultural economy of Taos, Rio Arriba, and Santa Fe Counties. These counties are included in the rural development program, a Department of Agriculture program inaugurated in 1954 to attack the problem of low-income farming areas. Approximately 8 percent of the population of 42,100 in Santa Fe County is receiving financial assistance from the State department of public welfare. The total amount of this assistance is $1,500,000 per year. In Taos County 19 percent of the total population of 15,100 is receiving such assistance, with total annual payments amounting $1,120,000. In Rio Arriba County 14 percent of the population of 24,900 persons is dependent upon public assistance, with total annual payments amounting to $1,400,000. The annual contribution of the Federal Government to these welfare payments in Santa Fe, Rio Arriba, and Taos Counties amounts to $2,870,000. As of 1956 the per capita income of Santa Fe County was $1,458 per year; Taos County, $717 per year; and Rio Arriba County, $642 per year. The economy of the area is traditionally based on agriculture, and the realistic solution to its problems is a reliable water supply for irrigated lands.

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New Mexico has recognized the serious and chronic economic distress in Taos, Rio Arriba, and Santa Fe Counties, and has recognized the wisdom of using a portion of the State's power revenue credits from the Colorado River storage project to rehabilitate the agricultural economy of these counties and thus return the people of the area to economic independence. It is clear that this use of power revenue credits will materially decrease the welfare burden of the Federal Government.

The project plan contemplates that 22,600 acre-feet of the imported water would be contracted for by the Middle Rio Grande Conservancy District. Recent studies have shown that the water supply of the middle Rio Grande project, once thought to be ample, must be increased to provide sufficient water for present requirements of the district. This increased supply would encourage improved farm practices and stabilize the agricultural economy in the Middle Valley of the Rio Grande.

Officials of New Mexico and the Bureau of Reclamation have worked with representatives of the Navajo Tribe and the Bureau of Indian Affairs to formulate a satisfactory operating agreement for the proposed projects. In December 1957 the Navajo Tribal Council adopted a resolution advocating equality of use of San Juan waters diverted at or above Navajo Dam for all future projects, including the Navajo irrigation project. By this action, the council recognized that the best possible use of available water requires that all water users share shortages during periods of drought when supply is inadequate to serve all uses fully, a principle which is extremely important to new development requiring Federal expenditure and investment of private risk capital. As a result of this historic and wise action by the Navao Council, the pending legislation assures equality of use while fully protecting the water supplies of the projects which would be authorized. H.R. 2352 and H.R. 2494 provide that all uses of water covered by the Secretary's filings including the authorized Hammond project, will be served on parity. This provision, does not, of course, apply to any rights which were established prior to the Secretary's filings.

In 1955 and 1956 the State engineer of New Mexico initiated water-right filings applying to all San Juan waters allocated to New Mexico which had not been previously appropriated. In 1958 these filings were assigned to the Secretary of the Interior. In compliance with New Mexico law, the Secretary has submitted to the State engineer plans pursuant to these filings. Thereby he is enabled to fully protect the water uses sought in the current legislation and also to plan future developments, including the proposed Animas-La Plata project, in such a way that ultimate uses will be assured an adequate water supply without infringing upon the rights of earlier appropriators. The Secretary has made filings to reserve water for the New Mexico portion of the Animas-La Plata project and the State and local interests in New Mexico strongly favor the construction of this project.

In conclusion, I cannot overemphasize the fact that New Mexico's plans for the use of her allocation of the water resources of the Upper Colorado River Basin have crystallized only after meticulous consideration of all the factors involved, including the potential uses to which that water might be put. The Department of the Interior, through its Bureau of Reclamation and Bureau of Indian Affairs, has played a role of leadership in planning the use of the water, but the Secretary has remained at all times fully sensitive to the wishes of the people of New Mexico. Needless to say, the State of New Mexico is deeply grateful for this cooperation and for the excellent planning which has given us so much help in resolving the very difficult water-use problems that once faced us.

I wish to express my appreciation for this opportunity of appearing before this subcommittee to express my thoughts and convictions regarding the legislation under discussion. Early implementation of both projects concerned is vital to the continued development of our State. Your favorable consideration is earnestly solicited.

Mr. COURY. Mr. Chairman, I think the statement speaks for itself and any discussion I might add to the statement would be at this ment superfluous. I would rather, in view of the fact that we are going to submit his statement for the record, I would rather have my time given to the witnesses who follow, Mr. Reynolds and Mr. Bliss.

Mr. ROGERS. Fine. Did the gentlemen with you desire to make any statement at this time?

Mr. STRAWN. No.

Mr. GALLAGHER. No, sir.

Mr. ROGERS. You are both members of the Interstate Streams Commission of New Mexico?

Mr. GALLAGHER. Yes.

Mr. STRAWN. Yes.

Mr. ROGERS. Does anyone have questions?

Mr. ASPINALL. Do I understand that Mr. Strawn and Mr. Gallagher helped prepare this statement?

Mr. GALLAGHER. We concur in it.

Mr. ASPINALL. You concur?

Mr. GALLAGHER. Yes.

Mr. ASPINALL. This is the official position of the State of New Mexico?

Mr. GALLAGHER. That is correct.

Mr. ASPINALL. Did you hear the question I asked this morning about the separation of the San Juan-Chama project and the Navajo participating project?

Mr. COURY. Yes, sir.

Mr. ASPINALL. Do you agree with the position that I stated, that is, that it should be understood in the legislation that these should be considered as an integrated operation but as separate entities and that the Navajo participating project does not have any bearing as far as financial contribution to the upper basin fund or from the upper basin fund of the Colorado River storage and development program?

Mr. COURY. Yes, sir.

Mr. ASPINALL. Am I right that you would not object to the separation of these two authorizations in the same bill and have it perhaps treated as title 1 and title 2?

Mr. COURY. As long as both bills remain or, rather, as long as both projects remain in the bill and both are authorized simultaneously, we have no objection.

Mr. ASPINALL. That is all.

Mr. ROGERS. Mr. Morris.

Mr. MORRIS. I would just like to welcome Mr. Coury and Mr. Strawn and Mr. Gallagher before the committee. I served on the Interstate Streams Commission of New Mexico and once served as chairman of the commission. I know of all the fine work these gentlemen have done on the commission, and I am very proud that they were able to come here and to present this statement to the committee. Thank you.

Mr. ASPINALL. Mr. Chairman.

Mr. ROGERS. The gentleman from Colorado.

Mr. ASPINALL. Do we have conservancy districts in the State of New Mexico so that the area which receives benefits indirectly from these projects may be asked to contribute somewhat to the cost of construction or to the maintenance through levies, and so forth?

Mr. COURY. Yes, sir.

Mr. ASPINALL. Is it contemplated we would have such conservancy districts serving the San Juan-Chama diversion area?

Mr. COURY. So I understand; yes, sir.

Mr. ASPINALL. That is all.

Mr. ROGERS. Thank you very much, gentlemen, for your fine presentation.

The Chair will now recognize Mr. Paul Jones, chairman of the Navajo Tribal Council, New Mexico.

STATEMENT OF PAUL JONES, CHAIRMAN, NAVAJO TRIBAL COUNCIL, NEW MEXICO; ACCOMPANIED BY CHARLES ALEXANDER, LOCAL LEGAL REPRESENTATIVE

Mr. JONES. Mr. Chairman, I have with me Mr. Charles Alexander, our local legal representative.

Mr. ROGERS. We welcome you, Mr. Alexander. You may sit at the witness table with Mr. Jones.

Mr. JONES. Mr. Chairman and members of the committee my name is Paul Jones. I reside at Window Rock, Ariz., and am appearing on behalf of the Navajo Tribe of Indians, of which I am the chief executive. I am appearing to urge early authorization of the Navajo Indian irrigation project in the State of New Mexico.

The Navajo Indian irrigation project, as described in the supplemental feasibility report, would consist of 110,630 acres of irrigated land for exclusive Navajo Indian use in San Juan County, N. Mex. All of the project except 19,640 acres will be on the present Navajo Indian Reservation. The additional acreage will be placed in reservation status, and the Navajo Tribe will pay the land acquisition costs. The purpose of adding this acreage to the reservation is to make the most compact and economical project feasible for Indian use.

The plan also calls for providing additional canal capacity for delivering water for industrial and municipal use from Navajo Dam, over and above the diversion requirement of the irrigation project. Such additional capacity would be paid for by the industrial and municipal water users with interest. All water uses from Navajo Dam would have equal priority. The Navajo Tribe has consented to this, and relinquished its rights under the Winters doctrine for the water necessary to irrigate the Navajo Indian irrigation project, in order to provide a practicable plan for comprehensive development of the resources and industrial potential of the San Juan Basin. We have done so because such development is necessary for our very survival.

The Navajo Tribe is the largest Indian tribe in the United States. Our population is now more than 85,000. We inhabit a reservation of approximately 25,000 square miles area—about the size of West Virginia—and adjacent submarginal lands in the State of New Mexico. It was estimated in 1947 that our reservation could support only 45,000 people at a decent standard of living. The reservation contains only 21,500 acres of dryfarming land. Yet in 1868 the United States by treaty promised 160 acres to any Navajo Indian head of a family and 80 acres to any other Navajo Indian over 18 years old who should desire to commence farming on the Navajo Reservation. Already at that time there were about 10,000 Navajo Indians. Obviously, if the treaty obligation is to have significance, irrigation is the most practicable solution.

The wealth and well-being of the Navajo people, based on our vast flocks of sheep, are mentioned in Spanish and American documents of the early 19th century. Yet, in 1868 we were forced to cede all but 3,500,000 acres of our original country of more than 30 million acres. At the same time we agreed to perpetual peace with the white man, and the Government agreed to make farmland available to our

members, as I have stated above, and to provide a schoolroom and teacher for every 30 of our children.

Since 1868, our population has grown to 85,000, and is currently increasing at the rate of about 2¼ percent per year. Our reservation has been increased in area to the 25,000 square miles I mentioned above, or about 16 million acres, but the added area, consisting largely of desert land, has not kept pace with the minimum needs of our increased population.

Federal assistance to the Navajo Indians has been invariably too little and too late. Our country is a seriously depressed area and in its present state cannot be reasonably expected to improve. Whatever improvement is effected must result from increasing the agricultural potential and industrialization.

For 1958, the last year for which we have figures available, the estimated average per capita income of a Navajo Indian was $467, compared with a national average of $1,940 per capita. Approximately 16.2 percent of individual Navajo income derives from welfare, unemployment compensation, and similar sources; 83.8 percent is earned income.

It is obvious that the Navajo people in their present condition are a drain upon the economy of New Mexico, and in fact of the entire Nation. It is equally obvious that prosperous Navajo people supporting themselves on their own land at the average American standard of living would be a great benefit to the economy of the States in which they reside and of the entire United States.

The Government and the tribe have tried many expedients to overcome Navajo poverty. In accordance with the recommendation of the Krug report of 1947, we tried a number of small industries utilizing native products. They all failed. We were fortunate enough to have uranium on our reservation, and we tried uranium mining with a great deal of success; but the bottom has dropped out of the uranium market. Many of our Navajos accepted jobs on the track gangs of railroads. That work has also contracted sharply, due to increased mechanization and to closed shop unionization agreements, the Santa Fe Railroad being the last carrier to adopt such an agreement. We are now working on development of our coal deposits. Although coal mining has been a weak and hazardous industry almost as long as I can remember, utilization of our coal reserves to fire proposed thermoelectric plants gives some promise of benefiting our Navajo economy. This will, of course, require water, which in large part we hope to obtain from the municipal and industrial water supply features of the Navajo Indian irrigation project.

However, with the population increasing at such a rate that it is estimated that it will equal 300,000 in the year 2000—only 40 years from now—it is obvious that massive and heroic measures must be taken, and at once.

The Navajo Indian irrigation project is such a measure. It will provide 1,120 family farms for Navajo Indians. It will give a livelihood in related service activities to another 2,240 families, thus providing a decent living for at least 12,000 Navajo Indians. These figures have been supplied by the Bureau of Indian Affairs. Actuallly, I feel they are excessively conservative.

I feel that the availability of adequate industrial and municipal water supplies in the San Juan Basin, together with abundant natural

resources, mild climate, large Navajo labor pool, and a basic local market including the 12,000 people to be supported by the irrigation project, the exploding population of the town of Farmington—now over 20,000 people—will provide the launching pad for substantial economic growth.

Under the upper Colorado River project legislation, the Navajo Indian irrigation project is said to be nonreimbursable. This simply means the Indian farmers will not have to repay directly to the Federal Government the cost of the irrigation features of the project. But they, like all other Americans, will pay income and excise taxes to the Federal Government. If the experience of the Salt River project is any criterion, and I am sure it is, the Federal taxes generated by the Navajo Indian irrigation project will repay the costs of its irrigation features many times over.

The Federal Government has not moral obligations, but explicit treaty obligations to the Navajo Tribe. For many, many years, although the appropriations have steadily increased, these obligations have not been completed fulfilled. The Navajos remain in substantially the same situation in which they have been since the Second World War, that is to say, the range is not capable of supporting sufficient livestock to give the tribal members a subsistence income; the limited areas adaptable to agriculture are insufficient to sustain even a small portion of the population, and even our industrialization program depends upon the approval of this project and the subsequent authorization of the right to divert a sufficient quantity of water to the Fort Defiance-Window Rock area to guarantee the continued operation of such industrial plants as we are able to bring here. As I see it, the economic value of the Navajo irrigation project is that it also makes possible and feasible industrialization of substantial areas of the reservation, which will provide my people permanent employment and job opportunities which will, to a large extent, overcome the economic plight with which they are now confronted.

The Navajo Dam was authorized by the original Colorado River storage project legislation in 1956. It is approximately one-third completed. It has no power features; aside from certain river regulating benefits, its only use is to supply water to the Navajo Indian irrigation project. Until our project is authorized, the Navajo Dam will stand as a useless monument.

Some of you may wonder why Federal expenditure is still necessary for rehabilitation of the Navajo people in view of our recent large oil income. I covered this subject in my statement to the Senate committee on S. 3648, of the 85th Congress. Briefly, I stated that the total cash balance of the Navajo Tribe, of approximately $65 million, was less than half the total cost of the Navajo Indian irrigation project—$134,359,100, 1958 figures. I stated that we Navajos do not use our oil income for per capita distribution, but we use it to provide needed public improvements and for services to our people, such as are provided by the States in the case of white people.

We are also making capital investment of our funds, and are expending $7,500,000 for a new sawmill, which will give employment to about 500 of our people, and support their families.

In my 1958 statement I also mentioned our farm training program. The program has been even more successful than I then contemplated.

We have a 1,200-acre farm near Shiprock, N. Mex., upon which we train 24 Navajo Indians at a time in modern, scientific, irrigated farming. To date we have graduated 15 men as fully qualified irrigation farmers. Due to delay in subjugating lands on existing irrigation projects on the reservation, only four of these men are actively farming, but we have just this spring managed to place the remaining graduates of our 1959 class. In another year we expect to place the remaining graduates from our 1960 class. We have invested about $500,000 in our farm training program, and so efficient has been the operation of this program that our training farm has returned to our treasury $22,000 in fiscal year 1959 and $34,000 this year. This is true although we never intended it to be a profitmaking enterprise. For the graduates who are placed on farms of their own, we make available loans from our revolving credit fund of as much as $19,000 apiece.

Our farm manager has stated—

that when the Navajo Indian irrigation project is authorized and farmland for placement of the graduates will be readily available, we can expand the capacity of our training farm to classes of 40 people each year.

The Intermountain School of the Bureau of Indian Affairs at Brigham City, Utah, has a similar program which turns out about 10 or 12 graduates a year, all of them Navajos. Two or three completely illiterate Navajos have completed our farm training program. They were illiterate when they entered the program, but they knew how to read and write English when they graduated, in addition to being qualified irrigation farmers.

In the operation of our training farm we have learned what crops are most feasible and yield the highest return on soils similar to that of the proposed Navajo Indian irrigation project. We have found that 3 crop years of alfalfa will build up the soil, and that thereafter without missing a single crop year, the lands can be sown to a number of grasses, and will produce superior irrigated pasture, capable of supporting 2 cows or 10 to 12 sheep per acre. Our training farm produces 6 tons per acre of alfalfa. The proposed Navajo Indian irrigation project should be just as productive. The actual cash crop of the farmers will be the livestock they feed from their pasture crops. We do not plan to produce any crops which are currently in surplus. With increased population in the San Juan Basin, undoubtedly a market for dairy products will also develop from the project lands.

By means of our training farm we are already producing fully qualified farmers to take over individual farm units on the proposed Navajo Indian irrigation project, and we are solving in advance the agricultural problems of similar soils under similar climatic conditions. We are ready for the project.

I do not wish to speak in detail on the form of legislation to authorize the Navajo Indian irrigation project. We have agreed with the State of New Mexico that the Navajo Indian irrigation project and the San Juan-Chama project should be presented as a package. We adhere to that agreement. Our representatives have participated in a series of meetings during the past winter and spring with representatives of the State of Colorado in order to meet Colorado's objections to our proposals. We have not committed ourselves to the form of legislation which has been worked out between New

Mexico and Colorado officials. However, we are willing to go along with any reasonable form of legislation. We understand that it is now proposed to give water users on the Animas River in Colorado exchange storage rights in the Navajo Reservoir. So long as these exchange storage rights have no priority over use of water on the proposed Navajo Indian irrigation project, we can go along with the proposal; but believe it only fair that we should have exchange storage rights in any reservoirs which may be constructed on the tributaries of the San Juan in Colorado. We cannot agree, however, to any proposal to grant Colorado water users a reserved amount of exchange storage in Navajo Reservoir which would have a higher priority than water for the Navajo Indian irrigation project. We do not believe that Colorado will insist upon such an unfair proposal.

Mr. Chairman, it is my earnest hope that the bill before the committee will receive its favorable consideration. The potential benefits to my people of this legislation are very great, indeed, and by the measure of our improved economic independence and stability, there follows a corresponding reduction in the present burden upon the Government.

Thank you very much.

I hope that Congressman Aspinall will go along with this. He has worked diligently with me during the early years of the Navajo Dam. I am sure he does not feel differently now that he did at that time. That is my hope.

Mr. ROGERS. Thank you, Mr. Jones.

In order to get the matter clarified I will now recognize Mr. Aspinall for any questions.

Mr. ASPINALL. I want to commend you for a very fine statement. I hope you understand that nothing has happened lately to cause me to be other than favorable to this project. Just because there has been a little difficulty between some Members of Congress does not mean that the gentleman from Colorado has withdrawn his support to the people whom he admires very, very much.

As soon as we can get this project into position, as far as being able to sell it to the House of Representatives, and we are sure that our timing is correct, then the gentleman from Colorado is hopeful, whether he is in the Chair or just a member of the committee, that we can bring it out and have it acted upon favorably.

I want you folks to realize that there is a whole lot more to shepherding one of these projects through the House of Representatives than just the mere wishes and hopes of the people or representatives of the area.

So far we have been very fortunate in the last 10 or 12 years. We have not lost one of these big projects yet. We have had one or two of them that have been buffeted around, largely because of ill timing, but we still have been able to save them. We hope in the future we will be able to get them all approved.

I was very pleased to have this statement because you had several things in the statement relative to the position of the tribe and its assets and its programs, matters concerning which I had been thinking, I had not had an opportunity to read your presentation to the other committee.

The other day, Mr. Jones, this committee recommended, and the House later on accepted, the legislation which transferred consider-

able reclamation development and some facilities from the Federal Government directly to the Navajo Tribe.

As I understood the legislation, it was of advantage to both the Navajo Tribe and to the Federal Government as such.

Have you heard any comment among the people of your tribe up to date that as soon as you got the Navajo participating project that you more than likely would ask the Federal Government to turn it over to you lock, stock, and barrel?

Mr. JONES. The only reason there is not as much as you might expect is that we are among the uneducated and it is difficult to bring that up with the rest of the population. We cannot bring the news right out. We have to sort of edit it and put it across. That is our only means of contact now, by radio, and we have had that comment made to them.

Mr. ASPINALL. Of course, as you understand, when this legislation receives the approval of Congress and the Executive Department, it is likely to carry the authorization that the funds be furnished to the Bureau of Indian Affairs, that the work be done by the Bureau of Reclamation, that the operation and management be carried on more than likely by the Bureau of Irrigation and Reclamation.

If that is not to be the program for the foreseeable future, then more than likely it would be better to just turn this amount of money over to the Navajo Tribe and say, "Go ahead, construct and develop your own project."

Mr. JONES. We have undertaken more seriously some of those important projects. As I said before as a beginning we have made quite a success. There have been some failures.

By the time this is authorized, I hope, and I am bringing college graduates back from various colleges and universities, with their help I see no reason why we should not undertake such a load as that.

Mr. ASPINALL. Why you should or should not?

Mr. JONES. Why we should not.

Mr. ASPINALL. In other words, you feel that perhaps by the time this project is constructed that you will be able to take over the operation and maintenance of it yourself. Is that right?

Mr. JONES. That is correct. We probably would not be dependent on all of the Navajos except this: We do not have any lawyers of Indian blood. We have to depend on men like him (referring to Mr. Alexander).

Mr. ASPINALL. If I know anything about some of your people if you get them on the right track they will make good lawyers.

Mr. JONES. I am hoping, too. We have several in colleges now.

Mr. ASPINALL. If the time does come in the immediate or the near future where you can take care of operation and maintenance you desire to do so?

Mr. JONES. That is right.

Mr. ASPINALL. More than likely under those circumstances you would accept the responsibility of taking care of the finances at the same time?

Mr. JONES. Yes.

Mr. ASPINALL. Do you have any non-Indians within the boundaries of the Navajo participating project?

Mr. JONES. Non-Indian in participation with that irrigation?

Mr. ASPINALL. Yes.

Mr. JONES. No.

Mr. ASPINALL. They will be all Indians?

Mr. JONES. Yes.

Mr. ASPINALL. Do you know of any further demands by the Navajo Tribe on the waters of the Colorado River within the State of New Mexico?

Mr. JONES. Other than for municipal use as I read in the report.

Mr. ASPINALL. In other words, at the present time you think the tribe will be satisfied as far as reclamation and irrigation development with this particular area?

Mr. JONES. Yes.

Mr. ASPINALL. Has the Navajo Tribe itself ever claimed any waters in the Animas or the La Plata Rivers other than those waters presently being used along the San Juan River Basin by Indians?

Mr. JONES. I do not recall. I do not believe so.

Mr. ASPINALL. That is all, Mr. Chairman.

Mr. ROGERS. Mr. Morris?

Mr. MORRIS. I would like to commend Mr. Jones for his fine statement, for the cooperation that he and the Navajo people have given the State of New Mexico in bringing this project before Congress.

Mr. Jones, you heard the great friend of the Indian people, the gentleman from Florida, Mr. Haley, this morning. I would like to have you state for the record—have you and the Navajo people been informed, met, and discussed this project from its inception with the officials of the State of New Mexico?

Mr. JONES. Yes.

Mr. MORRIS. You fully understand the project and you are fully aware of what it does, and the Navajo Indian Tribe is satisfied with the terms of the legislation as presently proposed?

Mr. JONES. Yes, sir.

As I mentioned in my opening statement, I mentioned the work I did with Congressman Aspinall.

Mr. MORRIS. Disregarding anything that has happened lately with the State of New Mexico and Colorado?

Mr. JONES. Yes.

Mr. MORRIS. Thank you, Mr. Jones.

Mr. ROGERS. Mr. Haley?

Mr. HALEY. I am sorry I am a little late. I just heard the last couple question propounded by the gentleman from New Mexico to the tribal chief. I think that was something that had disturbed me.

I believe your testimony is that you have been consulted from the beginning of this project and that you are thoroughly familiar with it and you are in favor of it. Is that correct?

Mr. JONES. Yes, sir.

Mr. HALEY. That is all I have.

I thank the gentleman from New Mexico, who not only is looking out after his own Indian citizens down there in propounding these questions but also protecting the gentleman from Florida.

I very much appreciate it.

Mr. ROGERS. Mr. McGinley?

Mr. MCGINLEY. I have no questions.

Mr. ROGERS. Judge Saund?

Mr. SAUND. I have no questions.

Mr. ROGERS. Thank you, Mr. Jones, and Mr. Alexander, for your presentations.

The Chair will now recognize John H. Bliss, upper Colorado River commissioner for New Mexico.

STATEMENT OF JOHN H. BLISS, UPPER COLORADO RIVER COMMISSIONER FOR NEW MEXICO

Mr. BLISS. I am John H. Bliss. I am the upper Colorado River commissioner for the State of New Mexico.

I have a prepared statement, Mr. Chairman, which is rather lengthy. I would like to present it for the record, if I may, and make brief comments thereon.

Mr. ROGERS. Without objection your statement will be included in the record at this point.

(Mr. Bliss' statement follows:)

STATEMENT OF JOHN H. BLISS, UPPER COLORADO RIVER COMMISSIONER FOR STATE OF NEW MEXICO

INTRODUCTION

My name is John H. Bliss. I am upper Colorado River commissioner for the State of New Mexico.

Governor Burroughs has already presented the basis for and background leading up to the formulation of the present plans for the Navajo Indian irrigation and San Juan-Chama diversion projects. The Secretary of the Interior's coordinated report presents the details of the two plans. In my statement I will discuss the general features of the two projects, their size, acreage served, municipal, and industrial use and, briefly, their costs and benefits. Also, because questions have been raised as to the adequacy of the water supply of the San Juan River and tributaries to serve the New Mexico projects currently under consideration, I will discuss in some detail the water supply available to New Mexico under compact allocations.

NAVAJO INDIAN IRRIGATION PROJECT

The Navajo project is one of the participating projects for which the legislation authorizing the Colorado River storage project provided priority in the completion of planning. The project would provide water for irrigation of a net area of 110,630 acres of Navajo Indian lands. This water would be furnished from Navajo Dam and Reservoir, a storage unit of the Colorado River storage project. Already 60 percent of the work on the dam and appurtenant facilities has been done and construction should be complete by 1963. Water would be conveyed from the dam to the lateral system by Navajo Canal, which would have a total length of about 150 miles.

The Bureau of Indian Affairs' 1955 feasibility report on this project contemplated the irrigation of a total of about 137,000 acres, about 27,000 of which were to be non-Indian lands. Upon reviewing that report the State of New Mexico recognized the need for reducing the size of the project to, (1) achieve a more feasible project, and (2) to reserve a larger amount of water for future municipal and industrial uses in the San Juan Basin and for lands in the proposed Animas-La Plata project. Subsequent conferences among representatives of the Navajo Tribe, the Bureau of Indians Affairs and the State of New Mexico led to the conclusion that the project should be reduced to approximately 110,000 acres for Indian use only, utilizing only the best of the lands incorporated in the plan described in the 1955 report. The Bureau of Indian Affairs' 1957 report on the project reflects those changes.

The changes described in the 1957 report contemplate that the Navajo Tribe will acquire nonreservation lands, some of which belong to the State of New Mexico. These State lands can be acquired for the Indian irrigation project by purchase or exchange through relatively simple administrative procedures. The Indians have already put these procedures in motion. H.R. 2352 and H.R.

2494 make necessary provisions for the utilization of all nonreservation lands that must be acquired for that purpose.

The Navajo project would provide a total of about 1,100 farms for the Indians, and the project would support about 18,000 Navajo people by farming and allied industries. On the basis of January 1959 prices the estimated construction cost of the project facilities, comprising outlet works, main supply canal and lateral distribution system, is about $135 million. The economics of the project have been analyzed using the criteria usually applied by the Department of the Interior and accepted by the Congress for the evaluation of irrigation projects. Senate Report No. 155 of the 86th Congress, 1st session, finds that the total evaluated benefits of the project for a 100-year period are 1.6 times the project costs.

The Navajo Canal, in addition to supplying the water for the irrigation of Navajo lands, can be used to convey water for domestic and industrial purposes. The Navajo Tribe has entered a lease contract with the Utah Construction Co. for the mining of coal on the reservation to produce steam-electric power. It is estimated that the production of power will ultimately require a diversion of 55,000 acre-feet of water per year. A part of this requirement may be delivered through Navajo Canal. Industries which the Navajos hope will be attracted to the reservation by this power may require additional amounts of water from the canal.

Also, the town of Gallup has expressed an interest in contracting for water from Navajo Dam to be conveyed through the canal to a point on the reservation about 75 miles from Navajo Dam for diversion into a reservoir and pipeline serving the domestic and industrial needs of the town of Gallup.

Both the Utah Construction Co. and the town have already discussed with the Secretary of the Interior possibilities for water storage and delivery service. The State of New Mexico believes that the authority which would be given the Secretary of the Interior by H.R. 2352 and H.R. 2494 would permit him to anticipate and provide for these and other potential domestic and industrial requirements through Navajo Canal.

SAN JUAN-CHAMA PROJECT

The San Juan-Chama transmountain diversion project was also given priority for study by Public Law 485. The project has been contemplated by New Mexico for more than a quarter of a century, and both the Colorado River compact of 1922 and the upper Colorado River compact of 1948 make provision for such usage of the waters of the upper Colorado River system.

New Mexico contemplates that water imported by the initial stage of the project would be utilized in accordance with the following developmental priorities.

1. Municipal and industrial supplies.
2. Development of water supplies for irrigation units on tributaries to the Rio Grande in depressed areas in northern New Mexico; and
3. Supplemental irrigation.

It is contemplated that 57,300 acre-feet of the imported water will be contracted for by the city of Albuquerque. The present source of municipal and industrial water in the Albuquerque area is the underground reservoir in the valley fill. This underground reservoir is interrelated with the surface flows of the Rio Grande because all ground water is ultimately derived from surface water supplies. Since November 1956 ground-water pumping in the Rio Grande Valley has been regulated to protect the fully appropriated surface water supply from new ground-water developments. The San Juan-Chama project plan proposes that Albuquerque's future requirements will be met by pumping from underground sources with the effects of the pumping on surface flows being offset by imported water released into the Rio Grande.

Albuquerque is one of the most rapidly growing cities in the United States. Located there are large installations which play a vital role in our program of research and development for national defense. An assured water supply is essential for the continuation and possible expansion of that program in the Albuquerque area, and to take care of the anticipated growth of Albuquerque as a trade, industrial, and recreation center in the Southwest. The estimated 1960 population of metropolitan Albuquerque is 264,000 with an estimated water usage amounting to 65,000 acre-feet per year. According to estimates used by the State engineer office the population of the Albuquerque area will be 730,000 by the year 2000 with water requirements amounting to 204,000 acre-feet per

year. These estimates are based on figures used by public utility companies for their planning, and are believed to be conservative.

Approximately 30,000 acre-feet per year of the imported water would be used on irrigation units on tributaries of the Rio Grande in northern New Mexico. These irrigation units cannot directly divert the imported water which is brought into the Rio Grande in the channel of the Chama River; however, the additional water to be used on these tributary irrigation units will be replaced by imported water.

The initial stage of the San Juan-Chama project which would be authorized by H.R. 2352 and H.R. 2494 would import 22,600 acre-feet of water for supplemental irrigation in the Middle Rio Grande Conservatory District. Deducting transportation losses, 19,500 acre-feet of this water would be available for diversion within the district. The analysis of water requirements made in the planning of the authorized middle Rio Grande project indicated a consumptive use of 1.76 acre-feet per acre per year for the lands in the district, and it was anticipated that when the middle Rio Grande project works were constructed there would be a full water supply for the district lands under the terms of the Rio Grande compact. Reevaluation studies conducted by the Bureau of Reclamation indicate that this amount is too low to provide a full water supply for the crops being grown at this time; these studies indicate a total yearly consumptive use of 2.03 acre-feet per acre. Thus, an additional 22,000 acre-feet is required for the 81,610 acres of arable lands within the district. The initial stage would provide 19,500 acre-feet of this additional demand. This amount added to the available Rio Grande water would provide nearly a full supply for the conservancy district lands.

No new irrigation works would be required to distribute the supplemental water to the conservancy district lands. The water would be released as needed from Heron No. 4, the reservoir in which the imported water will be stored on the east side, and diverted to district lands through existing facilities.

The additional water made available by the project would stabilize and improve the farm economy of the middle valley and, by assuring a nearly full supply of water, would encourage improved farm practices. For example, in some areas alfalfa is not replanted when it should be because of the uncertainty of a water supply adequate to start a new stand; also, the supplemental water would insure timely planting, obtain better crop rotation, and maintain higher yields. Lands that now lie idle a good share of the time because of the uncertainty of an adequate supply would be put in regular production.

H.R. 2352 and H.R. 2494 in addition to authorizing an initial stage of the San Juan-Chama project for an average annual diversion of 110,000 acre-feet would give congressional approval for the construction of initial stage works with sufficient capacity for a diversion averaging 235,000 acre-feet per year.

The Secretary of the Interior's 1955 feasibility report on the San Juan-Chama project describes a project for the diversion of an ultimate 235,000 acre-feet to the Rio Grande Basin and shows such a project to be feasible. However, estimates of anticipated power revenue credits available to New Mexico, as set forth in the Secretary's "Financial and Economic Analysis of the Colorado River Storage Project, December 1958," make it appear that a number of years must elapse before construction beyond an initial stage diversion of 110,000 acre-feet can be undertaken. It is impossible to know at this time whether the remaining available water supply will be imported to the Rio Grande by subsequently authorized stages or will ultimately be more urgently needed in the San Juan Basin. For this reason New Mexico now seeks authorization for an initial stage project constructed in substantial accordance with the plan described in the 1957 supplemental report but with initial stage works of sufficient capacity to convey an annual average diversion of 235,000 acre-feet.

The Secretary's 1955 feasibility report tabulates additional water requirements in the Rio Grande Basin amounting to 315,000 acre-feet per year presently, and 341,500 acre-feet per year within 50 years. Potential requirements which have come to light since the compilation of the report through notices of intention filed with the State engineer include 8,000 acre-feet per year for defense activities and related requirements in the Tularosa Basin of New Mexico, 5,000 acre-feet per year for the city of Santa Fe and 3,000 acre-feet per year for the city of Los Alamos.

In view of the foregoing there can be no doubt that it may be necessary to import up to 235,000 acre-feet per year for high order uses in the Rio Grande Basin. Accordingly, the State considers it essential that the capacity of the

conduit system of the initial stage of the diversion project be adequate to accommodate a possible ultimate diversion averaging 235,000 acre-feet per annum. If the tunnel and conduit system of the initial stage were constructed for a diversion averaging only 110,000 acre-feet per year the construction costs of the initial stage could be reduced by about $2.8 million, but the importation of additional amounts of water would then require paralleling of the original tunnel and conduit system. The cost of providing the additional capacity would then amount to about $15 million as compared to $2.8 million under the plan advanced in the supplemental report.

It is recognized that, if the contemplated future needs in the Rio Grande Basin are not met with San Juan water, about $2.8 million of the initial stage construction costs for tunnel and conduit capacity over and above that required for the diversion of 110,000 acre-feet per year will have to be met with power revenue credits allocated to New Mexico. The State feels amply justified in this commitment of power revenue credits to maintain flexibility in the plan of distribution of its water resources.

On the basis of January 1959 prices the estimated construction expenditure for the construction of the ultimate size project facilities is about $149 million. The estimated construction cost of project features of the initial stage project is about $86 million which includes $400,000 for minimum basic recreation facilities.

The Bureau of Reclamation has analyzed both the ultimate stage and the initial stage of the diversion project in accordance with the usual economic criteria applied by the Department of the Interior to reclamation projects and accepted by the Congress for its evaluation of such projects. According to the Secretary's 1955 feasibility report, a 100-year period analysis of the ultimate project shows a ratio of total benefits to costs equal to 1.84. Senate Report No. 155 of the 86th Congress, 1st session, gives the 1959 benefit-cost ratio as 1.7 to 1.

The Secretary's 1957 supplemental report on the initial stage project shows that for a 100-year period analysis the ratio of total benefits to cost is equal to 1.15. Senate Report No. 155 updates the cost figures and farm budget data and finds that the initial stage project as of January 1959 has a total benefit to cost ratio of 1.26 to 1 over a 100-year period.

WATER SUPPLY

In the course of the hearings on S. 3648 in 1958, Mr. Raymond Matthew, chief engineer, Colorado River Board of California, questioned whether New Mexico's entitlement to water under the Colorado River compacts would amount to enough to supply the requirements of the projects to be authorized by that bill in addition to the requirements of other existing and authorized uses in New Mexico. Also, some interested persons on the western slope in Colorado are concerned that authorization of the Navajo irrigation project and the initial stage of the San Juan-Chama project might not leave enough of New Mexico's entitlement to furnish water for the New Mexico portion of the proposed Animas-La Plata project. Animas-La Plata project involves lands in both Colorado and New Mexico and it is likely that the New Mexico lands must be included to make a feasible project.

The statement that Mr. Reynolds and I made at that time touched on the water supply for present and proposed uses of Colorado River water in New Mexico, but because of the misleading nature of the testimony presented by the southern California interests in that hearing and because of the concern of our neighbors in Colorado, Mr. Reynolds in March 1959 presented a statement to the Senate Irrigation and Reclamation Subcommittee which outlined the State's position. His statement in full is filed with this statement as appendix A for your ready reference.

For planning purposes New Mexico and the Department of the Interior have assumed that the State's entitlement to the waters of he San Juan River and its tributaries, under the provisions of the Colorado River compact, amounts to depletion at sites of use of 838,000 acre-feet per year. The studies presented in appendix A show that there is ample justification for this assumption.

A tabulation in appendix A shows that there is ample water within New Mexico's allocation for all existing and presently proposed uses including the depletion of 33,400 acre-feet per year which would be required for the New Mexico portion of the proposed Animas-La Plate project. Included in these proposed uses is the diversion of 224,000 acre-feet per year from Navajo Reservoid for future municipal and industrial purposes. This amount of water would take care of the needs of over 1,100,000 people as compared to a present popu-

lation of 69,650 in the San Juan Basin in New Mexico. It is obvious that many years will elapse before the Secretary has contracted that amount of water for future municipal and industrial developments. Thus, it seems absolutely clear that any concern that that there is not sufficient water for the Animas-La Plate project in New Mexico's allocation is not warranted. It is reasonable to believe that the Animas-La Plata project will be authorized and constructed long before the Secretary of the Interior has entered contracts for more than a small portion of the proposed municipal and industrial diversions of 224,000 acre-feet per year. It seems obvious that if additional hydrologic records and additional hydrologic investigations show that New Mexico's allowable depletion will be materially less than 838,000 acre-feet per year the Secretary of the Interior can and will protect the water supply of the Animas-La Plata project by limiting the total amount of water contracted from Navajo Dam.

CONCLUSION

In conclusion I wish to thank Chairman Rogers and the entire subcommittee for the opportunity of appearing before you and presenting this testimony. In particular, I wish to thank Congressman Aspinall, chairman of the Interior and Insular Affairs Committee, for his assistance in making available time, which I know is at a premium at this stage of the congressional session, for this hearing. I solicit your favorable consideration and action on H.R. 2352 and H.R. 2494.

APPENDIX A

STATEMENT OF S. E. REYNOLDS, STATE ENGINEER AND SECRETARY OF THE INTERSTATE STREAM COMMISSION OF THE STATE OF NEW MEXICO

My name is S. E. Reynolds. I am State engineer and secretary of the Interstate Stream Commission of the State of New Mexico. I appear in support of S. 72, which would authorize the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project in New Mexico.

On July 9, 1958, I presented a statement to this subcommittee in support of S. 3648, 85th Congress, 2d session, a bill which was introduced by Senator Anderson and Senator Chavez, and which had the same objectives as S. 72. I will not repeat the contents of that earlier statement at this time, but do respectfully invite the attention of this subcommittee to it.

In the course of the hearings on S. 3648, Mr. Raymond Matthew, chief engineer, Colorado River Board of California, questioned whether New Mexico's entitlement to water under the Colorado River compacts would amount to enough to supply the requirements of the projects to be authorized by S. 72 in addition to the requirements of other existing and authorized uses in New Mexico. Also, I understand that some interested persons on the western slope in Colorado are concerned that authorization of the Navajo irrigation project and the initial stage of the San Juan-Chama project might not leave enough of New Mexico's entitlement to furnish water for the New Mexico portion of the proposed Animas-La Plata project. The Animas-La Plata project involves lands in both Colorado and New Mexico and it is likely that the New Mexico lands must be included to make a feasible project.

My earlier statement touched on the water supply for present and proposed uses of Colorado River water in New Mexico, but because of the misleading nature of the testimony presented by the southern California interests and because of the concern of our neighbors in Colorado, I feel that some further testimony concerning the amount of water available to New Mexico under the Colorado River compact of 1922, and the Upper Colorado River Basin compact of 1948 is justified.

Mr. Matthew presented to this subcommittee certain exhibits which were prepared by Mr. John R. Erickson and introduced in connection with his testimony as a witness for the State of Arizona in the trial of *Arizona* v. *California, et al.* From these exhibits Mr. Matthew drew the conclusion that "the net water supply, after deducting mainstem reservoir evaporation losses available for use in the upper basin for participating projects, may not be more than 5 to 5.5 million acre-feet a year on the average. New Mexico's share, 11.25 percent of a median of those amounts, would be about 600,000 acre-feet a year average."

The exhibits, which set forth the operating characteristics of upper basin reservoirs and Lake Mead under certain assumptions and interpretations of the

operation of the Colorado River compact, appear to be of questionable value for the purpose intended by Mr. Matthew. Mr. Matthew made it clear that the figures in the exhibits do not reflect Mr. Erickson's views concerning the proper operation of the reservoirs. The record (*Arizona* v. *California, et al.;* transcript pp. 21,287, 21,839–42) reflects that Arizona counsel deny that the studies reflect their ideas of how the reservoirs should be operated. The record of the direct examination of Mr. J. R. Riter, U.S. Bureau of Reclamation, and Mr. Raymond Hill, consulting engineer, by California attorneys makes it clear that neither those attorneys nor those witnesses accept the studies as reflecting a proper operation of the reservoirs under the compact (*Arizona* v. *California*, transcript pp. 21,286, 21,732). In view of all this, the studies set forth in the exhibits appear to be consigned to bastardy and should be given no weight by this committee.

It appears very unlikely that the assumptions and interpretations, or the results of these studies, reflect the views of Mr. Erickson who is the same John R. Erickson who was interstate steam engineer and State engineer of the State of New Mexico, and who had a major responsibility in the planning of both of the projects that would be authorized by S. 72.

One of the assumptions incorporated in the Arizona exhibits presented by Mr. Matthew, of southern California, is that all of the virgin flow of the Colorado River at Lee Ferry over and above 15 million acre-feet in any year is available first to meet the obligation to deliver 1.5 million acre-feet of water per year at the international boundary. The result of this assumption is that an average of 1,280,000 acre-feet per year of that burden is placed on the upper basin. Even a casual reading of the 1922 compact will show, I believe, that there is no basis for such an assumption.

Another unrealistic and misleading assumption involved in the operation studies prepared by Mr. Erickson and presented to you by Mr. Matthew is that the upper basin reservoirs, from which the production of power is so important, would be operated in accordance with a 10-year schedule in which the annual release varies from as much as 13,928,000 acre-feet to as little as 1,049,000 acre-feet. Obviously very little of the power produced by such an operation would be useful or marketable.

Exhibits Nos. 358, 359, 360, and 361 presented to you by Mr. Matthew deal with the operating characteristics of Lake Mead and upper basin reservoirs with only 25 million acre-feet of effective storage capacity in the upper basin. Exhibit No. 366 is a summary of a study made considering 35 million acre-feet of upper basin effective storage capacity. Mr. Matthew could have been more helpful had he also invited your attention to Arizona exhibits Nos. 355, 356, and 357, which deal with the operating characteristics of Lake Mead and upper basin reservoirs with an effective storage capacity of 43 million acre-feet in the upper basin.

I will submit with my statement for your consideration copies of Arizona Exhibits 355, 356, and 357. These exhibits purport to show that with effective storage capacity of 43 million acre-feet in the upper basin it is possible with the flows that occurred in the period 1909 through 1956, for the upper basin to deplete the flows at Lee Ferry by 7.5 million acre-feet of water per year and yet not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years.

The studies presented in these exhibits do not involve the completely unwarranted assumption that the obligation to deliver water under the Mexican treaty falls first upon the upper basin. However, these studies do incorporate the unrealistic schedule of releases from upper basin reservoirs that I have mentioned before. For this reason I will also file with my statement studies which modify those presented by exhibits 355, 356, and 357 to reflect realistic releases from upper basin reservoirs. Also, the Erickson studies involve in part the use of a "folded" hydrologic record; that is, a repetition of the 1909–56 records in the operation of the upper basin reservoirs. Many engineers do not consider such use of hydrologic records to be technically sound, and, therefore, the record is not "folded" in the modified studies. To insure a conservative result the effective capacity of both the upper basin reservoirs and Lake Mead are considered to be empty at the beginning of the period of study.

It can be seen from the modified study that the application of a realistic release schedule has some effect on the Lee Ferry depletion that can be made by the upper basin. The modified studies show a depletion of 7,200,000 acre-feet per year as compared to 7,500,000 acre-feet per year in the original study.

The modified study indicates that the upper basin reservoirs would be emptied in the last year of the study and there would be a shortage of 783,000 acre-

feet for the upper basin depletion in that year as a result of the intense and protracted drought of 1953 through 1956. Actually the main regulatory unit in the upper basin, Glen Canyon Reservoir, doubtless would not be emptied in the last year of the study; the upper basin depletion would be much less than the 7.2 million indicated for 1953, 1954, and 1955 because of the shortage of water for the diversion demands of upper basin projects in those years. The total shortage of 783,000 acre-feet in the 48-year period (1909–56) is an average of only 16,400 acre-feet annually and is completely negligible for the purposes of the study. It is worth noting that there is about 1 chance in 10,000 that 4 successive years having flows as low as those of the 1953–56 period will again occur.

The modified study also shows that a sustained release of 8.4 million acre-feet per year can be made from Lake Mead without shortage as compared to the sustained release of 8.2 million acre-feet per year, with a minor shortage, indicated by the Erickson study. No spills from Lake Mead occur in either of the studies.

The following summary drawing upon evidence presented in *Arizona* v. *California* and other information confirms that the obligation to deliver water to Mexico and the lower basin allocation of beneficial consumptive use can be met under the operation presented in the modified study.

Availability of waters of the Colorado River system

Item	Acre-feet—millions	Reference
Virgin flow of Colorado River at Lee Ferry	15.2	Arizona Ex. No. 355.
Upper basin consumptive use	−7.2	
Total	8.0	
Virgin tributary contribution Lee Ferry to Hoover Dam	[1] +1.1	
Virgin tributary contribution Hoover Dam to international boundary	[1] +1.4	
Total	10.5	
Lower basin consumptive use	−8.5	
Total	2.0	
Net channel losses Hoover Dam to international boundary	−.3	Arizona Ex. No. 366.
Total	1.7	
Required delivery at international boundary	−1.6	Do.[2]
Remainder	0.1	

[1] Values indexed from "Report on Water Supply of the Lower Colorado River Basin, Bureau of Reclamation Project Planning Report, November 1952."
[2] Includes regulatory loss of 75,000 acre-feet.

In substantiation of the operation studies and summary which I have presented, I would again invite the subcommittee's attention to a report prepared in 1953 by Leeds, Hill & Jewett, consulting engineers for the State of Colorado. This report was published as Senate Document 23, 84th Congress, 1st session. The report shows that with a total reservoir capacity of 38 million acre-feet in the upper basin, a delivery of 7.5 million acre-feet annually at Lee Ferry can be made with a depletion of 7.5 million acre-feet per year in the upper basin.

The modified study shows that a depletion of 7.2 million acre-feet can be made in the upper basin. Of this amount 50,000 acre-feet per year is allocated to Arizona by the upper Colorado River compact. Of the remaining 7,150,000 acre-feet, 11¼ percent or 804,375 is allocated to New Mexico. Upstream use of water in the upper basin may, by reduction of flows and by replacement of non-beneficial vegetation, salvage some water now being lost in the river channels so that the depletion at sites of use in the upper basin may materially exceed the depletion as measured at Lee Ferry. The Leeds, Hill & Jewett report indicates that when the upper basin is fully developed such salvage may amount to 360,000 acre-feet per year. This is about 40 percent of the total amount potentially salvageable in the upper basin. If only one-fourth of the amount potentially salvageable by New Mexico is saved, about 46,000 acre-feet would thus be made available. Therefore, the total beneficial consumptive use of waters of the upper Colorado River that can be made in New Mexico may be as great as 850,000 acre-feet under the criteria of the modified study.

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It may be inferred from the foregoing summary that when more than 43 million acre-feet of effective storage capacity is available in the upper basin, the upper basin depletion can be increased to 7.4 million acre-feet per year, limiting beneficial consumptive use in the lower basin to 8.4 million acre-feet per year. It is my considered opinion that, as the decades go by and the value of water and aquatic recreation grow, impoundments will be constructed to utilize the last drop of water to which the upper basin is entitled.

I want to emphasize that the modified study and the summary of the available water supply which I have presented do not necessarily reflect New Mexico's conclusions as to the reservoir and river operation required by the law of the river. However, the assumptions made yield an upper basin depletion rate which is, in my opinion, a conservative estimate of the amount that the upper basin can claim. For example, the summary is based on the assumption that beneficial consumptive use in the lower basin will be measured by the depletion of the flow of the Colorado River at the international boundary. If it were assumed that beneficial consumptive use is to be measured by the amount of water consumed at sites of use in the lower basin, the amount of water available to the upper basin would be larger.

As a part of my statement in support of S. 3648 a table summarizing the upper Colorado River water available for use in New Mexico was presented. For the purposes of this statement that table has been revised to include possible future uses of water in New Mexico that were discussed in the earlier statement but not summarized in tabular form.

Upper Colorado River water available for use in New Mexico—Average annual stream depletion at sites of use

	Thousand acre-feet
New Mexico entitlement for planning purposes	838.0
Committed uses by present and authorized projects:	
Present uses	92.3
Share of evaporation losses from main-stem reservoirs [1]	73.3
Hammond project	6.8
Extension of Indian projects	24.7
Navajo Reservoir losses [2]	39.0
Utah Construction Co	39.0
Total committed uses	275.1
Available for proposed and future developments	562.9
Proposed in coordinated report:	
Navajo irrigation project [3]	252.3
San Juan-Chama project (initial stage)	110.0
Total proposed	362.3
Available for future developments	200.6
Municipal and industrial water from Navajo Dam [4]	112.5
Balance	88.1
Estimated additional reservoir losses-ultimate upper basin reservoirs	34.7
Balance	53.4
Animas-La Plata project-New Mexico lands	33.4
Remainder	20.0

[1] 11¼ percent of 652,000 acre-feet. Represents estimated depletion due to evaporation losses from Glen Canyon, Flaming Gorge, and Curecanti storage units. See p. 11, Financial and Economic Analysis, Colorado River Storage Project and Participating Projects, February 1958.

[2] From p. 11, Financial and Economic Analysis, Colorado River Storage Project and Participating Projects, February 1958.

[3] P. 8, Navajo Project, New Mexico, supplemental report, March 1957.

[4] Estimated depletion by the diversion of 225,000 acre-feet per year for municipal and industrial uses.

For planning purposes New Mexico and the Department of the Interior have assumed that the State's entitlement to the waters of the San Juan River and its tributaries, under the provisions of the Colorado River compacts, amounts to a depletion at sites of use of 838,000 acre-feet per year. The modified studies which I have presented indicate that there is ample justification for this assumption.

The uses listed include all present and authorized uses, including a substantial amount for power purposes (39,000 acre-feet) by the Utah Construction Co. under a State permit. Also included are depletions by the projects that would be authorized by S. 72 (362,300 acre-feet), and a possible depletion of 112,500 acre-feet per year as a result of municipal and industrial usage of water from Navajo Dam under contracts with the Secretary of the Interior. The table also shows a depletion of 33,400 acre-feet for the New Mexico portion of the proposed Animas-La Plata project. A feasibility report on this project is presently being prepared with interests in both New Mexico and Colorado contributing to the costs of the study. New Mexico is interested in the ultimate full development of the Animas-La Plata project and has made a filing reserving water for that project.

The tabular summary indicates that after the uses listed, including the proposed Animas-La Plata project, are fully developed 20,000 acre-feet per year of the 838,000 acre-feet will remain.

I would point out that some margin of safety over and above the 20,000 acre-feet per year indicated by the table is provided since the modified study shows that the total New Mexico depletion may amount to as much as 850,000 acre-feet when salvage by use is included. There is also a further margin of safety provided. The depletion figures set forth in the table are based on an ideal water supply for the uses listed. Our hydrology studies indicate that actually there will be a diversion shortage of about 3 percent for most of these uses, and, therefore, the total depletion will be about 19,000 acre-feet less than indicated by the table.

The water supply analysis presented here suggests that the Coloradoans interested in the Animas-La Plata project need not be concerned that New Mexico has not reserved enough of her depletion allowance for that project. Another consideration seems to make it absolutely clear that that concern is not warranted. It is reasonable to believe that the Animas-La Plata project will be authorized and constructed long before the Secretary of the Interior has entered contracts for water from Navajo Dam in amounts sufficient to cause more than a small portion of the depletion of 112,500 acre-feet per year set forth in the table. It seems obvious that if additional hydrologic records and additional hydrologic investigations show that New Mexico's allowable depletion will be materially less than 818,000 acre-feet per year the Secretary of the Interior can and will protect the water supply of the Animas-La Plata project by limiting the total amount of water contracted from Navajo Dam.

In summary there appears to be no reason for concern that the depletion which would result from all present and authorized uses in New Mexico and the uses that would be authorized by S. 72 would exceed the depletion that New Mexico is allowed under the law of the river.

In conclusion I wish to express my appreciation of the opportunity to appear before this distinguished subcommittee and to earnestly solicit your early and favorable action on S. 72.

Operating Characteristics of Upper Basin Reservoirs (Modified)

With 43,000,000 acre-feet effective storage; 7,200,000 acre-feet annual depletion at Lee Ferry, 7,500,000 acre-feet release per year to lower basin, plus spills

1909–56—Summary of operation study

[Unit, 1,000 acre-feet]

Water year	"Virgin flow" of Colorado River at Lee Ferry (per Arizona exhibit No. 355)	Column (2) less 7,200 [1]	Annual flow at Lee Ferry to lower basin	Continuing progressive series of 10 consecutive years	Effective reservoir storage content at end of year	Spill
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1909	23,275	16,075	7,500	75,000	8,575	0
1910	14,248	7,048	7,500	75,000	8,123	0
1911	16,028	8,828	7,500	75,000	9,451	0
1912	20,520	13,320	7,500	75,000	15,271	0
1913	14,473	7,273	7,500	75,000	15,044	0
1914	21,222	14,022	7,500	75,000	21,566	0
1915	14,027	6,827	7,500	75,000	20,893	0
1916	19,201	12,001	7,500	75,000	25,394	0
1917	24,037	16,837	7,500	75,000	34,731	0
1918	15,364	8,164	7,500	75,000	35,395	0
1919	12,462	5,262	7,500	75,000	33,157	0
1920	21,951	14,751	7,500	75,000	40,408	0
1921	23,015	15,815	13,223	80,723	43,000	5,723
1922	18,305	11,105	11,105	84,328	43,000	3,605
1923	18,269	11,069	11,069	87,897	43,000	3,569
1924	14,201	7,001	7,500	87,897	42,501	0
1925	13,033	5,833	7,500	87,897	40,834	0
1926	15,853	8,653	7,500	87,897	41,987	0
1927	18,616	11,416	10,403	90,800	43,000	2,903
1928	17,279	10,079	10,079	93,379	43,000	2,579
1929	21,428	14,228	14,228	100,107	43,000	6,728
1930	14,885	7,685	7,685	100,292	43,000	185
1931	7,769	569	7,500	94,569	36,069	0
1932	17,243	10,043	7,500	90,964	38,612	0
1933	11,356	4,156	7,500	87,395	35,268	0
1934	5,640	−1,560	7,500	87,395	26,208	0
1935	11,549	4,349	7,500	87,395	23,057	0
1936	13,800	6,600	7,500	87,395	22,157	0
1937	13,740	6,540	7,500	84,492	21,197	0
1938	17,545	10,345	7,500	81,913	24,042	0
1939	11,075	3,875	7,500	75,185	20,417	0
1940	8,601	1,401	7,500	75,000	14,318	0
1941	18,148	10,948	7,500	75,000	17,766	0
1942	19,125	11,925	7,500	75,000	22,191	0
1943	13,103	5,903	7,500	75,000	20,594	0
1944	15,154	7,954	7,500	75,000	21,048	0
1945	13,410	6,210	7,500	75,000	19,758	0
1946	10,426	3,226	7,500	75,000	15,484	0
1947	15,473	8,273	7,500	75,000	16,257	0
1948	15,613	8,413	7,500	75,000	17,170	0
1949	16,376	9,176	7,500	75,000	18,846	0
1950	12,894	5,694	7,500	75,000	17,040	0
1951	11,647	4,447	7,500	75,000	13,987	0
1952	20,290	13,090	7,500	75,000	19,577	0
1953	10,670	3,470	7,500	75,000	15,547	0
1954	7,900	700	7,500	75,000	8,747	0
1955	9,150	1,950	7,500	75,000	3,197	0
1956	10,720	[1] 4,303	7,500	75,000	0	0
Total	730,109	385,292	385,292			25,292
Average, 1909–56	15,211	8,027	8,027			527

[1] Upper basin depletion reduced to 6,417 in 1956.

Water year (1)	Annual flow at Lee Ferry to lower basin (2)	Estimated historic net gain Lee Ferry to Hoover Dam (per Arizona exhibit 356) (3)	Net inflow to Lake Mead (4)
1942	7,500	1,060	8,560
1943	7,500	792	8,292
1944	7,500	865	8,365
1945	7,500	731	8,231
1946	7,500	530	8,030
1947	7,500	713	8,213
1948	7,500	560	8,060
1949	7,500	725	8,225
1950	7,500	615	8,115
1951	7,500	457	7,957
1952	7,500	1,316	8,816
1953	7,500	482	7,982
1954	7,500	658	8,158
1955	7,500	658	8,158
1956	7,500	457	7,957
Total	385,292	45,472	430,764
Average, 1909–56	8,027	947	8,974

Operating Characteristics of Lake Mead [1]

With 43,000,000 acre-feet upper basin effective storage; 7,200,000 acre-feet annual depletion by upper basin, measured at Lee Ferry; and 7,500,000 acre-feet release per year to lower basin, plus spills

1909–56—Operation study

[Unit, 1,000 acre-feet]

Water year	Inflow to Lake Mead			End-of-year storage			Average reservoir elevation	Average reservoir area	Reservoir evaporation			Sustained annual release	Spill or short
	Net river inflow	From precipitation [1]	Total inflow	Bank	Surface	Total			(7.0′) gross	Channel salvage	Net		
1908				0	0	0							
1909	9,096	13	9,109	56	451	507					202	8,400	0
1910	8,865	18	8,883	86	691	777					213	8,400	0
1911	9,449	25	9,474	180	1,438	1,618					233	8,400	0
1912	8,329	28	8,357	148	1,185	1,333					242	8,400	0
1913	8,462	24	8,486	131	1,052	1,183					236	8,400	0
1914	8,816	20	8,836	154	1,228	1,382					237	8,400	0
1915	8,633	20	8,653	155	1,240	1,395					240	8,400	0
1916	9,224	16	9,240	221	1,764	1,985					250	8,400	0
1917	8,493	13	8,506	204	1,630	1,834					257	8,400	0
1918	8,518	12	8,530	190	1,522	1,712					252	8,400	0
1919	8,317	15	8,332	156	1,244	1,400					244	8,400	0
1920	8,530	20	8,550	146	1,165	1,311					239	8,400	0
1921	14,198	25	14,223	756	6,049	6,805					329	8,400	0
1922	13,158	29	13,187	1,235	9,876	11,111					481	8,400	0
1923	12,756	30	12,786	1,656	13,247	14,903					594	8,400	0
1924	8,109	29	8,138	1,557	12,454	14,011					630	8,400	0
1925	8,201	27	8,228	1,470	11,759	13,229					610	8,400	0
1926	8,249	25	8,274	1,390	11,123	12,513					590	8,400	0
1927	11,378	28	11,406	1,656	13,247	14,903					616	8,400	0
1928	10,773	30	10,803	1,849	14,795	16,644					662	8,400	0
1929	15,050	34	15,084	2,507	20,058	22,565					763	8,400	0
1930	8,367	37	8,404	2,417	19,340	21,757					812	8,400	0
1931	8,018	32	8,050	2,291	18,326	20,617					790	8,400	0
1932	8,870	29	8,899	2,260	18,083	20,343					773	8,400	0
1933	8,194	28	8,222	2,156	17,250	19,406					759	8,400	0
1934	7,975	24	7,999	2,030	16,242	18,272					733	8,400	0
1935	8,365	20	8,385	1,949	15,595	17,544					713	8,400	0
1936	8,225	19	8,244	1,855	14,839	16,694					694	8,400	0
1937	8,792	22	8,814	1,825	14,602	16,427					681	8,400	0
1938	8,737	26	8,763	1,791	14,326	16,117					673	8,400	0
1939	8,237	30	8,267	1,703	13,620	15,323					661	8,400	0
1940	8,256	33	8,289	1,619	12,952	14,571					641	8,400	0

1941	9,005	29	9,034	1,619	12,953	14,572					633	8,400	0
1942	8,560	26	8,586	1,570	12,560	14,130					628	8,400	0
1943	8,292	25	8,317	1,493	11,942	13,435					612	8,400	0
1944	8,365	20	8,385	1,425	11,404	12,829					591	8,400	0
1945	8,231	17	8,248	1,344	10,754	12,098					579	8,400	0
1946	8,030	15	8,045	1,243	9,942	11,185					558	8,400	0
1947	8,213	18	8,231	1,165	9,316	10,481					535	8,400	0
1948	8,060	22	8,082	1,072	8,578	9,650					513	8,400	0
1949	8,225	26	8,251	1,001	8,007	9,008					493	8,400	0
1950	8,115	29	8,144	920	7,362	8,282					470	8,400	0
1951	7,957	24	7,981	824	6,591	7,415					448	8,400	0
1952	8,816	20	8,836	824	6,593	7,417					434	8,400	0
1953	7,982	19	8,001	733	5,863	6,596					422	8,400	0
1954	8,158	14	8,172	663	5,305	5,968					400	8,400	0
1955	8,158	11	8,169	595	4,762	5,357					380	8,400	0
1956	7,957	10	7,967	507	4,059	4,566					358	8,400	0
Total	430,764	1,106	431,870								24,104	403,200	0
Average, 1909–56	8,974	23	8,997								502	8,400	

[1] Per Arizona's exhibit 357.

[Plaintiff's Exhibit No. 355: Identified July 1, 1958; admitted July 1, 1958]

OPERATING CHARACTERISTICS OF UPPER BASIN RESERVOIRS

With 43,000,000 acre-feet effective storage; 7,500,000 acre-feet annual depletion at Lee Ferry; 75,000,000 acre-feet releases per 10-year period to lower basin, plus spills

1909–56—Summary of operation study

[Unit, 1,000 acre-feet]

Water year	"Virgin flow" of Colorado River at Lee Ferry (per California exhibit 2205A)	Col. (2) less 7,500	Annual flow at Lee Ferry to lower basin	Continuing progressive series of 10 consecutive years	Effective reservoir storage content at end of year	Spill
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1909	23,275	15,775	7,500	75,000	8,275	0
1910	14,248	6,748	7,500	75,000	7,523	0
1911	16,028	8,528	7,500	75,000	8,551	0
1912	20,520	13,020	7,500	75,000	14,071	0
1913	14,473	6,973	7,500	75,000	13,544	0
1914	21,222	13,722	7,500	75,000	19,766	0
1915	14,027	6,527	7,500	75,000	18,793	0
1916	19,201	11,701	7,500	75,000	22,994	0
1917	24,037	16,537	7,500	75,000	32,031	0
1918	15,364	7,864	7,500	75,000	32,395	0
1919	12,462	4,962	7,500	75,000	29,857	0
1920	21,951	14,451	7,500	75,000	36,808	0
1921	23,015	15,515	9,323	76,823	43,000	1,823
1922	18,305	10,805	10,805	80,128	43,000	3,305
1923	18,269	10,769	10,769	83,397	43,000	3,269
1924	14,201	6,701	6,701	82,598	43,000	0
1925	13,033	5,533	5,533	80,631	43,000	0
1926	15,853	8,353	8,353	81,484	43,000	853
1927	18,616	11,116	11,116	85,100	43,000	3,616
1928	17,279	9,779	9,779	87,379	43,000	2,279
1929	21,428	13,928	13,928	93,807	43,000	6,428
1930	14,885	7,385	7,385	93,692	43,000	0
1931	7,769	269	269	84,638	43,000	0
1932	17,243	9,743	9,743	83,576	43,000	0
1933	11,356	3,856	3,856	76,663	43,000	0
1934	5,640	−1,860	5,038	75,000	36,102	0
1935	11,549	4,049	5,533	75,000	34,618	0
1936	13,800	6,300	8,353	75,000	32,565	0
1937	13,740	6,240	11,116	75,000	27,689	0
1938	17,545	10,045	9,779	75,000	27,955	0
1939	11,075	3,575	13,928	75,000	17,602	0
1940	8,601	1,101	7,385	75,000	11,318	0
1941	18,148	10,648	269	75,000	21,697	0
1942	19,125	11,625	9,743	75,000	23,579	0
1943	13,103	5,603	3,856	75,000	25,326	0
1944	15,154	7,654	5,038	75,000	27,942	0
1945	13,410	5,910	5,533	75,000	28,319	0
1946	10,426	2,926	8,353	75,000	22,892	0
1947	15,473	7,973	11,116	75,000	19,749	0
1948	15,613	8,113	9,779	75,000	18,083	0
1949	16,376	8,876	13,928	75,000	13,031	0
1950	12,894	5,394	7,385	75,000	11,040	0
1951	11,647	4,147	269	75,000	14,918	0
1952	20,290	12,790	9,743	75,000	17,965	0
1953	10,670	3,170	3,856	75,000	17,279	0
1954	7,900	400	5,038	75,000	12,641	0
1955	9,150	1,650	5,533	75,000	8,758	0
1956	10,720	3,220	8,353	75,000	3,625	0
1909		15,775	11,116	75,000	8,284	0
1910		6,748	9,779	75,000	5,253	0
1911		8,528	13,928	75,000	0	(1)
1912		13,020	7,385	75,000	5,635	0
1913		6,973	269	75,000	12,339	0
1914		13,722	9,743	75,000	16,318	0
1915		6,527	3,856	75,000	18,989	0
1916		11,701	5,038	75,000	25,652	0

[1] Short 147.

[Plaintiff's Exhibit No. 355: Identified July 1, 1958; admitted July 1, 1958]

OPERATING CHARACTERISTICS OF UPPER BASIN RESERVOIRS—Continued

With 43,000,000 acre-feet effective storage; 7,500,000 acre-feet annual depletion at Lee Ferry; 75,000,000 acre-feet releases per 10-year period to lower basin, plus spills—Continued

1909–56—Summary of operation study—Continued

[Unit, 1,000 acre-feet]

Water year	"Virgin flow" of Colorado River at Lee Ferry (per California exhibit 2205A)	Col. (2) less 7,500	Annual flow at Lee Ferry to lower basin	Continuing progressive series of 10 consecutive years	Effective reservoir storage content at end of year	Spill
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1917		16,537	5,533	75,000	36,656	0
1918		7,864	8,353	75,000	36,167	0
1919		4,962	11,116	75,000	30,013	0
1920		14,451	9,779	75,000	34,685	0
1921		15,515	13,928	75,000	36,272	0
1922		10,805	7,385	75,000	39,692	0
1923		10,769	7,461	82,192	43,000	7,192
1924		6,701	6,701	79,150	43,000	0
1925		5,533	5,533	80,827	43,000	1,677
1926		8,353	8,353	84,142	43,000	3,315
1927		11,116	11,116	89,725	43,000	5,583
1928		9,779	9,779	91,151	43,000	1,426
1929		13,928	13,928	93,963	43,000	2,812
1930		7,385	7,385	91,569	43,000	0
1931		269	269	77,910	43,000	0
1932		9,743	9,743	80,268	43,000	2,358
1933		3,856	3,856	76,663	43,000	0
1934		−1,860	5,038	75,000	36,102	0
1935		4,049	5,533	75,000	34,618	0
1936		6,300	8,353	75,000	32,565	0
1937		6,240	11,116	75,000	27,689	0
1938		10,045	9,779	75,000	27,955	0
1939		3,575	13,928	75,000	17,602	0
1940		1,101	7,385	75,000	11,318	0
1941		10,648	269	75,000	21,697	0
1942		11,625	9,743	75,000	23,579	0
1943		5,603	3,856	75,000	25,326	0
1944		7,654	5,038	75,000	27,942	0
1945		5,910	5,533	75,000	28,319	0
1946		2,926	8,353	75,000	22,892	0
1947		7,973	11,116	75,000	19,749	0
1948		8,113	9,779	75,000	18,083	0
1949		8,876	13,928	75,000	13,031	0
1950		5,394	7,385	75,000	11,040	0
1951		4,147	269	75,000	14,918	0
1952		12,790	9,743	75,000	17,965	0
1953		3,170	3,856	75,000	17,279	0
1954		400	5,038	75,000	12,641	0
1955		1,650	5,533	75,000	8,758	0
1956		3,220	8,353	75,000	3,625	0

[Plaintiff's Exhibit No. 356: Identified July 1, 1958; admitted July 1, 1958]

COLORADO RIVER—NET INFLOW TO LAKE MEAD, 1909–56

With 43,000,000 acre-feet effective river regulation storage in upper basin; and 7,500,000 acre-feet annual depletion by upper basin at Lee Ferry

[Unit, 1,000 acre-feet]

Water year	Annual flow at Lee Ferry to lower basin	Estimated historic net gain Lee Ferry to Hoover Dam (per California exhibit 2207)	Net inflow to Lake Mead
(1)	(2)	(3)	(4)
1909	11,116	1,596	12,712
1910	9,779	1,365	11,144
1911	13,928	1,949	15,877
1912	7,385	829	8,214
1913	269	962	1,231
1914	9,743	1,316	11,059
1915	3,856	1,133	4,989
1916	5,038	1,724	6,762
1917	5,533	993	6,526
1918	8,353	1,018	9,371
1919	11,116	817	11,933
1920	9,779	1,030	10,809
1921	13,928	975	14,903
1922	7,385	2,053	9,438
1923	7,461	1,687	9,148
1924	6,701	609	7,310
1925	5,533	701	6,234
1926	8,353	749	9,102
1927	11,116	975	12,091
1928	9,779	694	10,473
1929	13,928	822	14,750
1130	7,385	682	8,067
9931	269	518	787
1932	9,743	1,370	11,113
1933	3,856	694	4,550
1934	5,038	475	5,513
1935	5,533	865	6,398
1936	8,353	725	9,078
1937	11,116	1,292	12,408
1938	9,779	1,237	11,016
1939	13,928	737	14,665
1940	7,385	756	8,141
1941	269	1,505	1,774
1942	9,743	1,060	10,803
1943	3,856	792	4,648
1944	5,038	865	5,903
1945	5,533	731	6,264
1946	8,353	530	8,883
1947	11,116	713	11,829
1948	9,779	560	10,339
1949	13,928	725	14,653
1950	7,385	615	8,000
1951	269	457	726
1952	9,743	1,316	11,059
1953	3,856	482	4,338
1954	5,038	658	5,696
1955	5,533	658	6,191
1956	8,353	457	8,810
Total	370,256	45,472	415,728
Average, 1909–56	7,714	947	8,661

[Plaintiff's exhibit No. 357: Identified July 1, 1958]

Operating Characteristics of Lake Mead

With 43,000,000 acre-feet upper basin effective storage; 7,500,000 acre-feet annual depletion by upper basin, measured at Lee Ferry; and 75,000,000 acre-feet releases per 10-year period to lower basin, plus spills

1909–56—Operation study

[Unit, 1,000 acre-feet]

Water year	Inflow to Lake Mead			End-of-year storage			Average reservoir elevation (mean sea level)	Average reservoir area (1,000 acres)	Reservoir evaporation			Sustained annual release	Spill or short
	Net river inflow	From precipitation [1]	Total inflow	Bank	Surface	Total			(7.0′) gross	Channel salvage	Net		
1908				0	0	0							
1909	12,712	13	12,725	473	3,788	4,261	945	43.2	302	38	264	8,200	
1910	11,144	18	11,162	761	6,086	6,847	1,005	60.0	420	44	376	8,200	
1911	15,877	25	15,902	1,558	12,466	14,024	1,067	82.2	575	50	525	8,200	
1912	8,214	28	8,242	1,495	11,961	13,456	1,100	94.7	663	53	610	8,200	
1913	1,231	24	1,255	667	5,340	6,007	1,059	79.0	553	49	504	8,200	
1914	11,059	20	11,079	940	7,520	8,460	1,028	67.5	472	46	426	8,200	
1915	4,989	20	5,009	540	4,318	4,858	1,021	65.1	456	45	411	8,200	
1916	6,762	16	6,778	346	2,767	3,113	980	52.1	365	42	323	8,200	
1917	6,526	13	6,539	132	1,055	1,187	946	43.4	304	39	265	8,200	
1918	9,371	12	9,383	236	1,885	2,121	935	40.8	286	37	249	8,200	
1919	11,933	15	11,948	617	4,934	5,551	978	51.5	360	42	318	8,200	
1920	10,809	20	10,829	863	6,906	7,769	1,021	65.1	456	45	411	8,200	
1921	14,903	25	14,928	1,551	12,410	13,961	1,071	83.7	586	50	536	8,200	
1922	9,438	29	9,467	1,623	12,980	14,603	1,105	96.9	678	53	625	8,200	
1923	9,148	30	9,178	1,661	13,284	14,945	1,109	98.6	690	54	636	8,200	
1924	7,310	29	7,339	1,496	11,965	13,461	1,104	96.5	676	53	623	8,200	
1925	6,234	27	6,261	1,217	9,733	10,950	1,085	89.0	623	51	572	8,200	
1926	9,102	25	9,127	1,259	10,074	11,333	1,074	84.8	594	50	544	8,200	
1927	12,091	28	12,119	1,629	13,031	14,660	1,093	92.0	644	52	592	8,200	
1928	10,473	30	10,503	1,812	14,496	16,308	1,116	101.4	710	55	655	8,200	
1929	14,750	34	14,784	2,461	19,690	22,151	1,147	114.1	799	58	741	8,200	
1930	8,067	37	8,104	2,362	18,891	21,253	1,165	122.9	860	58	802	8,200	
1931	787	32	819	1,464	11,714	13,178	1,130	107.1	750	56	694	8,200	
1932	11,113	29	11,142	1,722	13,773	15,495	1,105	96.9	678	53	625	8,200	
1933	4,550	28	4,578	1,253	10,021	11,274	1,096	93.1	652	53	599	8,200	
1934	5,513	24	5,537	901	7,209	8,110	1,058	78.6	550	49	501	8,200	
1935	6,398	20	6,418	657	5,251	5,908	1,025	66.5	465	45	420	8,200	
1936	9,078	19	9,097	712	5,697	6,409	1,014	62.9	440	44	396	8,200	
1937	12,408	22	12,430	1,131	9,047	10,178	1,042	72.5	508	47	461	8,200	
1938	11,016	26	11,042	1,386	11,087	12,473	1,076	85.5	598	51	547	8,200	
1939	14,665	30	14,695	2,035	16,281	18,316	1,115	100.9	706	54	652	8,200	

[Plaintiff's exhibit No. 357: Identified July 1, 1958]

OPERATING CHARACTERISTICS OF LAKE MEAD—Continued

With 43,000,000 acre-feet upper basin effective storage; 7,500,000 acre-feet annual depletion by upper basin, measured at Lee Ferry; and 75,000,000 acre-feet releases per 10-year period to lower basin, plus spills—Continued

1909–56—Operation study—Continued

[Unit, 1,000 acre-feet]

Water year	Inflow to Lake Mead			End-of-year storage			Average reservoir elevation (mean sea level)	Average reservoir area (1,000 acres)	Reservoir evaporation			Sustained annual release	Spill or short
	Net river inflow	From precipitation [1]	Total inflow	Bank	Surface	Total			(7.0') gross	Channel salvage	Net		
1940	8,141	33	8,174	1,954	15,627	17,582	1,136	109.4	766	57	709	8,200	
1941	1,774	29	1,803	1,174	9,391	10,565	1,103	96.0	672	53	619	8,200	
1942	10,803	26	10,829	1,404	11,234	12,638	1,079	86.7	607	51	556	8,200	
1943	4,648	25	4,673	954	7,629	8,583	1,068	82.6	578	50	528	8,200	
1944	5,903	20	5,923	653	5,227	5,880	1,028	67.5	472	46	426	8,200	
1945	6,264	17	6,281	401	3,211	3,612	993	56.0	392	43	349	8,200	
1946	8,883	15	8,898	444	3,550	3,994	977	51.2	358	42	316	8,200	
1947	11,829	18	11,847	807	6,455	7,262	1,006	60.4	423	44	379	8,200	
1948	10,339	22	10,361	996	7,971	8,967	1,040	71.8	503	47	456	8,200	
1949	14,653	26	14,679	1,654	13,228	14,882	1,082	87.8	615	51	564	8,200	
1950	8,000	29	8,029	1,565	12,516	14,081	1,107	97.7	684	54	630	8,200	
1951	726	24	750	680	5,436	6,116	1,063	80.6	564	49	515	8,200	
1952	11,059	20	11,079	952	7,612	8,564	1,030	68.2	477	46	431	8,200	
1953	4,338	19	4,357	480	3,837	4,317	1,018	64.2	449	45	404	8,200	
1954	5,696	14	5,710	171	1,366	1,537	961	47.1	330	40	290	8,200	
1955	6,191	11	6,202	0	0	0	915	36.4	255	36	219	8,200	0.680
1956	8,810	10	8,820	47	374	421	901	33.3	233	34	199	8,200	
Total	415,728	1,106	416,834						25,797	2,304	23,493	393,600	.680
Average, 1909–56	8,661	23	8,684						537	48	489	8,200	.14

Mr. ROGERS. You may proceed.

Mr. BLISS. I want to talk just briefly about the reason for this coordinated plan, why we are here with the coordinated plan for these two projects.

These projects were conceived many years ago, 30 or 40 years ago.

As long as 22 years ago the Rio Grande compact between the States of Colorado, New Mexico, and Texas recognized the potentiality of taking some San Juan River water over into the Rio Grande Basin. It was recognized by that compact, and it is recognized by the upper Colorado River compact of 1948, and it is incorporated in the current legislation before you.

In a project which will take water out of the natural basin into another basin, there are always problems, as anyone in the West will tell you. The question is whether the water should be transported, is there enough water for in-basin usage and out-of-basin usage.

We started working on this problem in cooperation with the Bureau of Reclamation 6 to 8 years ago. There was a coordinating committee appointed by the Secretary of the Interior to work out the potential uses in both basins.

The State worked very closely with them.

One of the other difficulties was the fact that the Navajo Indians are one of the largest users of the water supply. At that time we were faced with the possibility that the doctrine of the Indians had the first and prior right to the water of the San Juan River and it could jeopardize the entire project.

We worked closely with Paul Jones and the tribal council.

After discussion with them in which this was explained in great detail the Navajo Tribal Council by unanimous action agreed that the best use of the water was to share it equally with the water users both in the basin and those in the transmountain diversion insofar as that could be done. That is all incorporated in our present bill.

The chairman of the main committee, Congressman Aspinall, has asked whether these two could be divided. I do not see how the two projects can be divided because they refer to the agreements which have been reached and hammered out over a period of 5 or 6 years.

Part of my presentation goes to the matter of water supply. We have worked with the Bureau of Reclamation on the question of water supply. We find there is ample water not only to take care of the New Mexico uses but to supply water for Colorado projects both in the State and those which are joint projects.

There is a great deal more I can say but in the interest of time I will close my statement. I do want to thank you very much for making this opportunity available for us to be present, and I want to thank Congressman Aspinall for his making this time available when I know your entire committee is quite occupied.

Mr. ROGERS. Thank you, Mr. Bliss, for your presentation.

Mr. Aspinall, have you questions?

Mr. ASPINALL. It is good to see our friend, the commissioner from New Mexico to the Upper Colorado River Commission, here.

What do you think I mean by dividing the project, Mr. Bliss?

Mr. BLISS. I am not quite sure, Mr. Congressman, what you do mean.

Mr. ASPINALL. What purpose do you think I have in mind when I suggested that legislation be separated so that the authorization refers to two distinct projects?

You saw fit to say that you heard me make the statement and that you do not think it can be divided.

Mr. BLISS. Let us say this: So long as the agreements which have been hammered out here, the operating agreements between the two basins, are maintained, I suppose there is no objection to having a title I and a title II to this bill.

Mr. ASPINALL. I have no objection to having this project considered as an integrated project. I think it should be considered as an integrated project.

All I am trying to do is to write the record to show that the San Juan-Chama is an integral part of the whole program of the upper Colorado River project, and that it deserves the contributions which it has a right to expect from that project, and it has the responsibility, to repay, at the same time. I desire to show that the Navajo participating project, although it is an integrated part of the Colorado River project, nevertheless it is purely and simply an Indian project and it must be considered as such.

Mr. Jones just confirmed my thinking, that as soon as we get it constructed as such the tribe wishes to operate it, which I think is fine, I have no objection to that. Most certainly it would have to be operated in accordance with the agreements made between the interests in New Mexico and with the other parts of the upper basin.

Mr. BLISS. Yes, sir. I agree with you that it is an Indian project and Public Law 485, the upper Colorado River storage project, makes provision for the payment for it.

Mr. ASPINALL. There will be nothing in the ultimate phase of the San Juan-Chama which will relate in any way to the Navajo participating project other than your agreement on the operation of the amounts of water; is that correct?

Mr. BLISS. I would say that is correct.

Mr. ASPINALL. I will reserve the balance of my time.

Mr. HALEY. I have no questions.

Mr. SAUND. I have no questions.

Mr. ROGERS. Thank you very much, Mr. Bliss. I am sure that the statement you filed will furnish the answers to most of the members' questions.

Mr. BLISS. Thank you, Mr. Chairman.

Mr. ROGERS. Mr. Reynolds, do you care to testify?

Mr. REYNOLDS. Yes, sir, if I may.

Mr. ROGERS. Please come forward, Mr. Reynolds.

STATEMENT OF MR. S. E. REYNOLDS, STATE ENGINEER AND SECRETARY OF THE INTERSTATE STREAM COMMISSION OF THE STATE OF NEW MEXICO; ACCOMPANIED BY CLAUD MANN, ASSISTANT ATTORNEY GENERAL OF THE STATE OF NEW MEXICO, AND LEGAL ADVISER TO THE NEW MEXICO INTERSTATE STREAM COMMISSION

Mr. REYNOLDS. Mr. Chairman, Mr. Aspinall, distinguished committee members, my name is S. E. Reynolds. I am State engineer and secretary of the Interstate Stream Commission of the State of New Mexico.

Mr. Claud Mann, who joins me in this statement, is legal adviser to the Interstate Stream Commission of the State of New Mexico.

Mr. ASPINALL. If I may ask a question before Mr. Reynolds starts. Your statement as such has been attached to the statement of Mr. Bliss, has it not?

Mr. REYNOLDS. This statement of mine which was filed with Mr. Bliss' statement is a statement concerning water supply that was submitted before the Senate committee in connection with S. 72 in 1959. It is not related to what I propose to say today.

Mr. ASPINALL. You are not afraid we will get mixed up a little bit because there might be some differences between the two, are you?

Mr. REYNOLDS. No, sir.

If I may, Mr. Chairman, I should like to file this rather bulky statement with the committee, but I should like to very briefly review it and to some extent supplement it orally if I may.

Mr. ROGERS. What you mean is that you want this included in the record?

Mr. REYNOLDS. Yes, sir, with the attachments thereto.

Mr. ROGERS. Does that include all of the attachments here?

Mr. REYNOLDS. Yes, sir. There are 14 attachments. Actually there will be one additional filed later when we are able to reproduce it, which should be sometime today.

Mr. ROGERS. Is this the original Senate bill which you have attached to the attachment number 6?

Mr. REYNOLDS. I think not, sir. It is a revised draft of the original statement.

Mr. ROGERS. I see.

Mr. REYNOLDS. The details of the statement outline carefully the significance of each of the attachments.

Mr. ROGERS. I see what you mean. I have looked through the bill. In other words, these appendages are put on here in order to be exhibits of what you have explained in the statement?

Mr. REYNOLDS. Yes. They are submitted to make perfectly clear the record of the negotiations between the States of Colorado and New Mexico.

Mr. ROGERS. Is there objection?

Mr. HALEY. Reserving the right to object, Mr. Chairman, I am wondering whether in the record we need all of these exhibits. It makes quite a voluminous record. We can have the witness fully explain his

statement, but I am wondering if we could take his statement and then put some of these exhibits in the files.

Mr. ROGERS. If the gentleman would yield, that is the point really that I was making.

I have glanced through this and these exhibits are all tied in to some of the explanations. I have an idea it would be much more difficult to try to separate them than to try to include them all in the record.

Mr. HALEY. Then I will withdraw my objection.

Mr. ROGERS. Without objection the statement and the attachments will be included in the record.

(The statement and attachments referred to follow:)

STATEMENT COVERING THE SAN JUAN-CHAMA DIVERSION PROJECT AND NAVAJO IRRIGATION PROJECT

Presented by S. E. Reynolds, State engineer and Claud S. Mann, special assistant attorney general, State of New Mexico

My name is S. E. Reynolds. I am State engineer and secretary of the Interstate Stream Commission of the State of New Mexico. In these capacities I have responsibility for the administration and development of the water resources of the State of New Mexico.

Mr. Claud Mann who joins me in this statement is special assistant attorney general of the State of New Mexico and legal adviser to the New Mexico Interstate Stream Commission. We appear in support of H.R. 2352 and H.R. 2494 which would authorize the proposed Navajo Indian Irrigation project and the San Juan-Chama project.

COMMENTS OF THE STATE OF TEXAS

The official comments of the State of Texas on the San Juan-Chama project suggested that the authorizing legislation should include provisions requiring, (1) compliance with section 2 of Public Law 485, (2) that the project be constructed so as to permit compliance physically with all of the provisions of the Rio Grande compact, (3) operation of the works at all times in conformity with the Rio Grande compact, (4) that the hydrologic measurements and relationships that should be developed for the administration and accounting of imported San Juan River flows and Rio Grande flows be described in a written report and distributed to affected States, including the State of Texas, as provided in the Flood Control Act of 1944 before any construction of the San Juan-Chama project is undertaken, and (5) that the amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project be limited in any calendar year to the amount of imported water available to such uses in that year.

On the occasion of the hearings on S. 3648 the provisions which the State of Texas had suggested were discussed by representatives of the States of Texas and New Mexico and agreement in principle on these provisions was reached. By letter dated July 21, 1958, Edwin L. Mechem, then Governor of the State of New Mexico, forwarded to Senator Anderson language for proposed amendments which would provide Texas the assurances sought by the State and which would be satisfactory to the State of New Mexico. A copy of that letter will be filed with our statement as attachment 1. The language of the amendments forwarded with the letter is incorporated in H.R. 2352 and H.R. 2494 in subparagraphs 1, 2, and 3 of section 6a.

The comments of the Elephant Butte Irrigation District in New Mexico generally parallel those of Texas and the objections raised there would also be met, we believe, by the provisions of the subparagraphs which I have just mentioned.

COMMENTS OF THE STATE OF CALIFORNIA

Most of the unfavorable comment on the proposed projects comes, as can be expected, from southern California representatives. We believe that the objective of those representatives is to prevent forever any project for consumptive use of water in the Upper Colorado River Basin. Water allocated to but not used by such projects will, by the law of gravity, flow on downstream and be available for

the development of hydroelectric energy and for beneficial consumptive uses in the lower basin, chiefly southern California.

New Mexico is able at present to utilize only about 10 percent of the water allocated to our State by the Colorado River compacts. Other States of the upper basin find themselves much in the same situation. In contrast, extensive development of Colorado River water has been made in the lower basin, chiefly in southern California and Arizona.

Following the ratification of the Colorado River compact of 1922, Hoover Dam, Parker Dam, Davis Dam, Imperial Dam, and the All-American Canal, all of which serve the States of the Lower Colorado River Basin only, were constructed with the agreement and active cooperation of the upper basin States. Thus, for many years, the beneficiaries of these works have enjoyed the fruits of the major construction needed to utilize the Colorado River waters allocated to the lower basin. The lower basin power interests for many years have been able to utilize for power production not only lower basin water, but also water allocated by the seven-State compact for consumptive uses in the upper basin. Substantial amounts of this power, although as dependable as firm power, have been sold to the power companies at dump rates which are about one-fourth the rate for firm power. This has resulted in beneficial use of the water, but it should be noted that the Boulder Canyon Adjustment Act, under which the power contracts are being operated, contemplates that the upper basin States will ultimately make full use of their compact allocations.

In her official comments, the State of California makes three recommendations:

"1. In the event the San Juan-Chama and Navajo projects are authorized, the authorizing legislation provides specifically that the projects shall not impair in either quality or quantity the rights of the State of California in and to the waters of the Colorado River."

The State of New Mexico and the other States of the Upper Colorado River Basin intend to comply fully with the several documents which comprise the law of the river. Public Law 485 (the Colorado River Storage Project Act of 1956) reaffirms these documents. A reiteration of their principles in the present legislation is unnecesary because the law of the river is already clearly established.

The Colorado River compact of 1922 allocated "in perpetuity to the upper basin and to lower basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum." The compact also stated that "present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact." This latter is a simple declaration of fact. It is self-evident that the consumptive use of 7,500,000 acre-feet of water above Lee Ferry will inevitably change both the quantity and quality of the remaining flows to the lower basin. Aside from this, however, the assumed detriment to the lower basin users by reason of transmountain diversions of "good quality" water is a misconception which should be laid to rest.

The mechanics of successful irrigation require that disolved solids in the water be flushed out by drainage and return flows to the stream; otherwise the salts would accumulate in the soils and the growing of crops would soon become impossible. Thus in irrigation the water is consumed while the dissolved solids are retained in the residual streamflow. Since transmountain diversions remove both salts and water from the basin, the remaining supply is actually of better quality than would result had the same water been consumed by irrigation in the basin. Thus California appears to be misguided, or misguiding, when she focuses her objections on transmountain diversion projects.

California also recommends that:

"2. Any authorizing legislation provide that none of the waters of the Colorado River system shall be exported from the natural basin of that system by means of works, constructed under authority of this act, or extensions or enlargements of such works, to the Rio Grande Basin for consumptive use outside of the State of Mexico, and no such waters shall be made available for consumptive use in any State not a party to the Colorado River Compact by exchange or substitution or by use of return flow; nor shall the obligations of the State of New Mexico under the provisions of the Rio Grande compact be altered by any operations of any project for transmountain diversion of Colorado River system water into the Rio Grande Basin."

New Mexico intends to comply fully not only with the Colorado River compact, but also with the Rio Grande compact of 1938. In fact, there is a special provision in section 2 of Public Law 485 which specifically protects the rights of the other States signatory to the Rio Grande compact. A substantial amount is included

in the cost estimate for the San Juan-Chama project to install and operate a large number of gaging stations on the Rio Grande and its tributaries to keep accurate account of the uses of all imported waters. Such accounting will provide adequate assurance to the States of both the Rio Grande and Colorado River Basins.

This amendment recommended by California would provide that none of the waters of the Colorado River system shall be made available for consumptive use in any State not a party to the Colorado River compact by exchange, substitution or return flow. Any transmountain diversion results in commingling imported waters with in-basin waters. When the waters are once commingled the imported water cannot be used without involving, to some degree, substitution or exchange with in-basin water. In the instance of almost every possible upper basin transmountain diversion there are downstream States, not parties to the Colorado River compact, which have rights to a portion of the in-basin waters and, therefore, substitution or exchange of imported water for in-basin water in which other States may have rights, is inescapable. The Colorado River compact provides for transmountain diversion projects and thus by any commonsense construction of its provisions permits substitution or exchange. New Mexico maintains her right to substitute or exchange Colorado River water for Rio Grande water in which Texas may have a right.

California asserts that New Mexico would violate the Colorado River compact should one drop of return flow from imported Colorado River water pass down the Rio Grande to another State. New Mexico believes that, if the imported water is put to beneficial use within her boundaries, the escape of return flow to Texas would not constitute a violation of the 1922 compact. However, New Mexico contemplates that in this instance the imported water will be so measured and managed that its equivalent will be fully consumed within the State.

In her comments California appears to contend that water exported from the upper basin must be accounted as a consumptive use in the year exported even though the water is stored out of the basin for use in a later year. California further contends that with exported water thus accounted the total consumptive use in the upper basin may not exceed 7.5 million acre-fee in any year. California's implication is that, when consumptive uses in the upper basin approach the limit allowed by the 1922 compact, it would be necessary to reduce in-basin consumptive use in years when larger than average amounts of water are exported for out-of-basin storage.

The main storage reservoir of the San Juan-Chama project will be constructed in the Rio Grande Basin on the east side of the Continental Divide. It will be necessary, in years when the San Juan River has a good water supply, to export and store amounts of water substantially greater than the average annual diversion in order that the needs of water users under the project can be met in years when little water is available for exportation. While the amount of water exported may vary widely from year to year, the annual amount drawn from storage will, of course, be fairly uniform.

New Mexico takes the position that, even if article III(a) of the compact were construed to set the upper limit of beneficial consumptive use in any year rather than the average, it is perfectly clear that water which has been exported and stored has not been applied to beneficial consumptive use any more than water stored within the basin. Water cannot properly be accounted as beneficially consumed under the provisions of the compact until it has been released from storage for use or is actually consumed by evaporation.

California comments include criticism of the economic aspects of the Navajo and San Juan-Chama projects. California analyzes the economics of the two projects using her own set of assumptions and arrives at the conclusion that neither project is justified economically. This analysis has been loaded with the same specious criteria and assumptions which were used by California in opposing the authorization of the Colorado River storage project in 1956 and which the Congress resoundingly rejected at that time.

For example, California's economic analysis charges $800,000 of the cost of Navajo Reservoir against the San Juan-Chama project. She overlooks the fact that Public Law 485 authorized Navajo Dam and Reservoir as an initial unit of the storage project, all of the costs of which are to be repaid from power revenues. In making its economic appraisal of the project the Bureau assessed an annual use charge, based on the average annual depletion, to take into account the project's appropriate share of the cost of the authorized initial storage units. This assessment against the San Juan-Chama project amounts to $2 per acre-foot of depletion, or $220,000 per year. In a 100-year analysis this

annual charge is sufficient to retire a capital investment of $8 million at 2.5 percent.

California's assessment of $800,000 of the costs of Navajo Dam against the San Juan-Chama project is small as compared to the storage assessment used in the Bureau analysis, but nonetheless its use results in a duplication of charge for storage.

Similarly, California's analysis of the Navajo project duplicates charges by adding costs of construction of Navajo Dam to the costs of the irrigation project even though the Bureau of Indian Affairs' economic analysis already includes a charge of $2.50 per acre-foot of depletion to account for the project's fair share of the cost of the storage units.

In its comments, which are attached to and made a part of the State's comments, the Colorado River Board of California states that the consumptive use of water by the proposed projects would "reduce hydroelectric power output at downstream (Hoover Dam) plants" and "would be a detriment from the national standpoint" and, therefore, "the value of the lost power should be deducted from the estimated project national benefits."

The use of water for development of power is subservient to use for domestic and agricultural purposes under the terms of the compact. Further, the legislation under which Hoover Dam was authorized recognized that progressive depletions of the water supply would be made by upstream developments and specific reductions were made in the power schedules to reflect these depletions. For this reason, the economic analyses set forth in the Secretary's report do not and should not include negative power benefits resulting from depletions by projects envisioned by the Colorado River compact.

By assuming a higher interest rate and a longer construction period than that used by the Department of the Interior, and by other devices including those mentioned above, California seeks to show that the two projects are uneconomical. We would point out to the committee that both of these projects have been carefully analyzed by the Department of the Interior in accordance with criteria specified by Public Law 485 and criteria adopted and accepted by the Department of the Interior and the Congress for the evaluation of water projects. Under these criteria both projects have been found to be economically feasible.

In connection with hearings on S. 3648 before the Senate Subcommittee on Irrigation and Reclamation, Senator Kuchel, on behalf of the Colorado River Board of California, submitted a series of proposed amendments. These proposed amendments parallel to some extent the amendments recommended in the official comments of the State of California. The position of the State of New Mexico on the proposed amendments submitted by the Senator was set forth in a letter from the Governor of the State of New Mexico dated July 21, 1958. A copy of the proposed amendments and a copy of the Governor's letter of July 21 are filed with this statement as attachments 2 and 3, respectively.

As a result of negotiations with the State of Colorado there have been certain changes in New Mexico's position on some of California's proposed amendments. The first amendment proposed by California would delete from section 1 of H.R. 2352 congressional approval of the ultimate San Juan-Chama project for the diversion of an average of 235,000 acre-feet per annum; the stated purpose being to make it plain that only the initial stage of the project is approved and that only that stage is intended to be authorized. New Mexico now agrees to such a proposed amendment provided that the language of section 6(b) authorizing the Secretary of the Interior to construct the tunnel and conduit works of the initial stage of the project with sufficent capacity for future diversion of an average of 235,000 acre-feet per annum is retained.

The second amendment proposed by California would have limited the initial stage of the San Juan-Chama project to an aggregate diversion of 1,100,000 acre-feet in any period of 10 consecutive years and would have added a proviso that nothing in the act shall constitute a commitment, real or implied, to the further exportation of water from the Colorado River system. New Mexico still finds such an amendment unacceptable; however, in our negotiations with the State of Colorado we have agreed to a provision which would limit the initial stage project to a diversion of 1,350,000 acre-feet in any period of 10 consecutive years and have agreed to a proviso that "nothing contained in this Act shall be construed as committing the Congress of the United States to future authorization of any additional stage of the San Juan-Chama Project."

New Mexico's position on all of the other amendments proposed by California remains the same as set forth in the Governor's letter of July 21, 1958 (attachment 3).

COMMENTS OF THE STATE OF COLORADO

The official comments of the State of Colorado noted that "the construction of the San Juan-Chama and Navajo projects, along with other potential projects, and the development of prospective uses of water in the San Juan Basin would be of great benefit to the area served," and make no objections to the projects that would be authorized by H.R. 2352. However, the Colorado comments also noted apparent differences of opinion existing in respect to the projects and pointed out that the Governors of the States of New Mexico and Colorado "are following established procedures to determine the facts involved and to attempt to resolve any differences that are found to exist."

Governor McNichols' letter of February 12, 1958, to the Governor of the State of New Mexico asked for the appointment of commissioners to enter into detailed consideration of the questions involved in the development of the waters of the San Juan Basin. Governor Mechem's reply of February 14, 1958, agreed to the appointment of commissioners for the purposes suggested, and gave assurance of continued cooperation. Copies of Governor McNichols' letter and the reply of the Governor of New Mexico are filed with this statement as attachments 4 and 5, respectively.

The Secretary's coordinated report on the San Juan-Chama and Navajo irrigation projects was submitted to the State of Colorado for formal comment on October 17, 1957.

After the submission of her formal comments on February 20, 1958, the State of Colorado, through a specially appointed study commission, initiated a detailed study of the proposed projects. To assist in this study New Mexico furnished detailed water use data and water supply analyses as requested and offered to provide whatever other data and analyses Colorado might find helpful in her deliberations. New Mexico also offered to meet with Colorado representatives at any time to discuss whatever problems might be of concern to the State of Colorado.

The Colorado studies were not completed until January 15, 1960, at which time Mr. Felix Sparks, director of the Colorado Water Conservation Board, addressed a letter to the State engineer of New Mexico forwarding a series of proposed amendments to S. 72, the bill which was passed by the Senate in 1959 and which is identical to H.R. 2352 and H.R. 2494. The letter also offered to meet with New Mexico representatives to discuss the proposed amendments. A copy of S. 72 with the proposed amendments indicated thereon is filed with this statement as attachment 6.

Meetings were held in Santa Fe on February 2 and 3 of this year to discuss the amendments proposed by Colorado. At these meetings a revised draft was developed for consideration by the two States. A copy of S. 72 with the amendments as revised at Santa Fe indicated thereon is filed with this statement as attachment 7.

A draft, different from the one developed at Santa Fe, was submitted to and approved by the Colorado Water Conservation Board on February 17. The respects in which the draft approved by the Colorado board differed from the Santa Fe draft are indicated on attachment 8 which is filed with this statement.

The changes which had been made in the Santa Fe draft prior to its submission to the Colorado board were handed to New Mexico representatives on February 17 and on February 18 New Mexico advised Colorado that these changes were unacceptable. Working with one of the duly appointed Colorado representatives, New Mexico officials offered substitute language for the amendment to section 2 which it was thought would meet the Colorado objectives. The proposed substitute language is indicated on attachment 9 which is filed with this statement. Colorado officials ultimately found this proposal unacceptable.

It became clear to the New Mexico representatives that Colorado's objective was a specific provision in the authorizing legislation that waters of the San Juan arm of the river entering or stored in Navajo Reservoir should be used to meet requirements of senior rights downstream that might otherwise, under the law of the river, constitute demands against the proposed Animas-La Plata project for the bypass of direct flows of the Animas River. New Mexico feels that such use of Navajo Reservoir would be authorized by H.R. 2352 in its present form, but to give Colorado the assurance desired New Mexico, at a meeting in Denver on March 14, proposed an amendment to section 7 of the bill. The proposed amendment is set forth on attachment 10 which is filed with this statement. This proposal was discussed in great detail at the March 14 meeting

and was later studied by Colorado with the cooperation of the Bureau of Reclamation. New Mexico was advised that the proposal was unacceptable to Colorado by copy of a memorandum from Mr. Sparks on March 23, 1960.

On April 5 Governor McNichols and Mr. Sparks met in Santa Fe with Governor Burroughs and the State engineer of the State of New Mexico, and proposed the amendments to section 2 of H.R. 2352 indicated on attachment 11. On April 7 Governor Burroughs rejected this proposal with the following telegram:

"On April 5 you and Mr. Felix Sparks handed me the wording of a proposed change in S. 72, the bill which would authorize the Navajo irrigation project and San Juan-Chama project in New Mexico. New Mexico has considered your proposal carefully and finds it unacceptable.

"At the meeting in Santa Fe on February 2 and again in Denver on March 14, New Mexico representatives offered a proposal which would permit the use of water entering or stored in Navajo Reservoir to furnish water to old rights in New Mexico located on the San Juan River below the Animas River. This use of Navajo Reservoir would reduce the amount of water that users from the Animas River in Colorado would otherwise be required to bypass in times of low supply under the terms of the compact, and would thus increase the water supply available to Colorado users. Embodied in New Mexico's proposal is the principle that all uses from the reservoir including this use for the benefit of Colorado appropriators would be on parity; that is in times of water shortage all users benefiting from the reservoir should share equitably in the water supply available from the reservoir.

"The New Mexico representatives have made it clear that New Mexico could not accept language which would not preserve this principle. The proposal which you have offered would as would the other Colorado counterproposals on this issue, make the use of Navajo Reservoir for the Navajo irrigation project and other uses in New Mexico subordinate to the use of the reservoir for the benefit of Animas River users in Colorado, and thus would not preserve the principle which is important to New Mexico. I invite your early and careful reconsideration of the New Mexico proposal.

"JOHN BURROUGHS,
"Governor of New Mexico."

We would point out that the differences in the New Mexico proposal of March 14 and the Colorado proposal of April 5 involve only a very small amount of water, averaging 4,000 acre-feet per year or less under reasonable assumptions of runoff, river development and return flows. However, New Mexico felt that she could not, in fairness to all concerned including the Navajo Indians, depart from the principle that in times of water shortage all users benefiting from Navajo Reservoir should share equitably in the water supply available from the reservoir.

On April 29, Mr. Sparks met with New Mexico representatives in Santa Fe and following that conference on May 2 submitted for New Mexico's consideration proposed amendments to section 2, section 6, and section 7 of S. 72 as revised at the Colorado-New Mexico conference in Santa Fe on February 2 and 3. The proposed amendments are set forth on attachment 12. By letter dated May 6, 1960, the State of New Mexico accepted these proposed amendments in principle with minor changes. A copy of that letter is filed with this statement as attachment 13. On May 11, 1960, the Colorado Water Conservation Board formally approved a series of amendments to H.R. 2352.

A copy of H.R. 2352 as it would be amended pursuant to the May 11 action of the Colorado Board is filed herewith as attachment 14.

New Mexico is fully satisfied with the provisions of H.R. 2352 and H.R. 2494 as introduced by Congressmen Morris and Montoya; however, we are authorized to advise the committee that the State of New Mexico agrees in principle to the provisions of the amended draft approved by the Colorado Water Conservation Board on May 11, 1960 (attachment 14).

We believe that the record of the negotiations between New Mexico and Colorado which we have outlined here demonstrates a diligent effort in good faith on the part of both States to resolve a very complex and difficult problem. We have burdened the record, perhaps unduly, but we did wish to show the great amount of time and effort that both States have expended to resolve the differences. The State of New Mexico is most grateful to Colorado for her part in bringing about agreement.

We urge the committee's early and favorable action on this legislation which would authorize projects of vital importance to the State of New Mexico. We are most grateful for this opportunity to appear before you in support of these projects.

ATTACHMENT 1

STATE OF NEW MEXICO,
July 21, 1958.

Hon. CLINTON P. ANDERSON,
U.S. Senate,
Senate Office Building, Washington, D.C.

DEAR SENATOR ANDERSON: Your letter of July 10, 1958 requests the comments of the State of New Mexico on an amendment to section 6 of S. 3648 which was offered by representatives of the State of Texas.

I believe that Texas and New Mexico are in agreement as to the principles of the proposed amendment. Wording which is satisfactory to the State of New Mexico is set forth in the attachment hereto.

Your courtesy in providing New Mexico an opportunity to comment on this proposed amendment is sincerely appreciated.

Sincerely,

E. L. MECHEM, *Governor.*

PROPOSED AMENDMENTS TO SECTION 6

Add to section 6 of S. 3648:

"*Provided:* (a) All works of the project, both in its initial stage and in its final development, shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact.

"(b) The amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year.

"(c) Details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided,* That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this paragraph shall be incorporated in a written report transmitted to the States of Colorado, Texas, and New Mexico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction."

ATTACHMENT 2

COLORADO RIVER BOARD OF CALIFORNIA—AMENDMENTS PROPOSED TO S. 3648, TO AUTHORIZE THE NAVAJO INDIAN IRRIGATION PROJECT AND THE SAN JUAN-CHAMA PROJECT AS PARTICIPATING PROJECTS OF THE COLORADO RIVER STORAGE PROJECT

A number of amendments are proposed to S. 3648, the texts of which are attached. The amendments may be explained as follows:

1. Amendments to section 1 re approval of the San Juan-Chama project

This bill would appear to approve the full San Juan-Chama project in section 1, while authorizing only the initial stage in section 6. Such approval is recommended at page 32 of the regional director's supplemental report of May 1957. This recommendation is concurred in in the letter of September 6, 1957, to the Secretary, submitted jointly by the Commissioners of Indian Affairs and Reclamation. The purpose of the proposed amendments is to clear up any possible

confusion by making it plain that only the initial stage is approved and that only that stage is intended to be authorized.

2. Amendment to section 6 re authorization of the San Juan-Chama project

This amendment is to some extent supplementary to those proposed in section 1.

The supplemental report of May 1957, indicates that various project features will be constructed to accommodate the ultimate stage of the San Juan-Chama project and $2,800,000 of "deferred costs" are included. For this reason we think the disclaimer of any commitment to the ultimate stage is necessary and appropriate. In addition, to avoid the problems which can result for other basin works in the extreme variations in diversions which may be made, we suggest the inclusion of the 10-year aggregate.

3. Proposed new section subjecting the projects to the law of the river

This proposal is in four subsections. Subsections (a), (b), and (d) are in the main modeled on four amendments made at the insistence of upper basin interests to the bill which authorized the "second barrel" of the San Diego aqueduct (act of Oct. 11, 1951; Public Law 171, 82d Cong.), with necessary modifications. These subject the projects to the compacts, statutes, and treaties which comprise part of the so-called law of the river. In addition, subsection (d) also includes a declaration that Congress, by enacting this bill, does not interpret these documents. This is to guard against interpretations in the project reports (incorporated by reference in the bill) which are not agreed to by all of the States of the Colorado River Basin. All of these subsections were adopted by the committee at our suggestion in connection with S. 60, the Fryingpan-Arkansas bill, and appear in section 7 of that measure. Subsection (c) of our proposal would prohibit the use of any Colorado River system waters outside of the State of New Mexico. This subsection is in most respects the same as the proposal adopted by the committee in section 7(c) of the Fryingpan bill.

4. Proposed new section re quality of water studies

The quality of water remaining to the lower basin after consumptive uses in the upper basin is a matter of continuing concern. The question is accentuated when projects involving transmountain diversions are proposed. This proposed new section, if adopted, should result in a meaningful quality study of real value to the entire basin. It was offered in connection with the Fryingpan bill. The Interior Department commented on the House side that it had no objection to the general purpose of this proposal because "we should have just as much information of that kind as can be reasonably worked out and put together," but that it might involve more work than was necessary (hearings on H.R. 594, pp. 170, 171). We consider it imperative that the study suggested should be made.

5. Proposed new section re litigation and State water rights

This was also offered in connection with the Fryingpan bill. The Interior Department objected on several grounds in a communication to the House committee (hearings on H.R. 594, pp. 168–170), while pressing no objection to the use of about the same language as in section 14 of the Colorado River Storage Project Act, which is the action the House subcommittee took, with some modifications. A major objection was to the inclusion of the word "construction." The inclusion of the contracts entered into was also objected to. We think both of these features are within section 7 of the Storage Project Act relating to the operation of the hydroelectric features of the project. The purpose of our amendment is to bring all of this material into one provision applicable basinwide. To cure Interior's objection to the use of the Supreme Court as the original forum for disputes arising under contracts, we have added a sentence permitting access by the contracting parties to any court of competent jurisdiction.

6. Proposed new section re limitation on transmountain diversions

One action which would assist measurably in the quality-of-water problem would be the adoption of an effective limitation on the water which may be taken out of the natural basin of the upper river by transmountain diversion. This proposal is patterned on the California Limitation Act which was required under section 4(a) of the Boulder Canyon Project Act. Both the Board and west slope interests in Colorado offered similar amendments in the House (hearings on H.R. 594, pp. 96, 97 (serial No. 11); same hearings, pp. 22–25 (serial No. 19)).

The matter was recently raised in the Senate hearings on the Fryingpan project in 1955 when the following colloquy occurred:

"Senator ANDERSON. Before you go to your conclusion, Mr. Ely, have you ever given any thought to the possibility that the States of the upper basin might end this question of diversion, cross-mountain diversion project, by some sort of self-limitation act as California did, fixing the total amount?

"Mr. ELY. Yes, Mr. Chairman, I have. In my conclusion I come to that very point.

"Senator ANDERSON. I had thought this matter had come up several times and we are going to have to come to a resolution of it some time. I wondered if it might not be well to set down some boundaries eventually and say that so much can be diverted" (hearings on S. 300, p. 223).

The Arizona House passed a resolution in April 1955 which, among other things, opposed any projects to export additional water out of the basin (hearings on H.R. 412, p. 346).

At the time of the colloquy between Senator Anderson and Mr. Ely, just cited, California offered to attempt negotiations of a limitation on transmountain diversions. We renew that offer now. The estimates of possible transmountain diversions from the upper basin at the time of the Colorado River compact were on the order of 350,000 to 500,000 acre-feet per year maximum. We understand the upper limit is exceeded now in Colorado alone. The projects inventoried in the Bureau's report on the Colorado River in 1947 (H. Doc. 419, 80th Cong., 1st sess.), aggregate on the order of about 3 million acre-feet of transmountain diversions. Senator Anderson indicated that we were going to have to come to a resolution of the problem sometime. We think the time is now.

No. 1

1. Amendments to section 1 re approval of the San Juan-Chama project:

(*a*) On page 2, line 2, insert between "and" and "the": "the initial stage of".

(*b*) On page 2, strike lines 4 and 5, and insert: " 'Supplemental Report on San Juan-Chama Project, Colorado-New Mexico, May, 1957', such project plans and reports having been".

No. 2

2. Amendment to section 6 re authorization of the San Juan-Chama Project:

On page 5, line 24, delete the period and insert: "but not to exceed an aggregate of 1,100,000 acre-feet in any period of 10 consecutive years, and nothing in this act shall constitutute a commitment, real or implied, to the further exportation of water from the Colorado River System."

No. 3

3. Proposed new section subjecting projects to the law of the river:

"SEC. —. (a) The use of water, including that diverted from the Colorado River System to the Rio Grande Basin, through works constructed under authority of this act, shall be subject to and controlled by the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, and the Mexican Water Treaty (Treaty Series 994), and shall be included within and shall in no way increase total quantity of water to the use of which the State of New Mexico is entitled and limited under said compacts, statute, and treaty, and every contract entered into under this act for the storage, use, and delivery of such water shall so recite.

"(b) All works constructed under authority of this act, and all officers, employees, permittees, licensees, and contractees of the United States and of the State of New Mexico acting pursuant thereto and all users and appropriators of water of the Colorado River System diverted or delivered through the works constructed under authority of this act and any enlargements or additions thereto shall observe and be subject to said compacts, statute, and treaty, as hereinbefore provided, in the diversion, delivery, and use of water of the Colorado River System, and such condition and covenant shall attach as a matter of law whether or not set out or referred to in the instrument evidencing such permit, license, or contract 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 System.

"(c) None of the waters of the Colorado River System shall be exported from the natural basin of that system by means of works constructed under authority of this act, or extensions and enlargements of such works, to the Rio Grande

River basin for consumptive use outside of the State of New Mexico, and no such waters shall be made available for consumptive use in any State not a party to the Colorado River Compact by exchange or substitution or by use of return flow; nor shall the obligations of the State of New Mexico under the provisions of the Rio Grande River Compact (53 Stat. 785) be altered by any operations of any project for transmountain diversion of Colorado River System water into the Rio Grande Basin.

"(d) No right or claim of right to the use of the waters of the Colorado River System shall be aided or prejudiced by this act, and Congress does not, by its enactment, construe or interpret any provision of the Colorado River Compact, the Upper Colorado River Basin Compact, The Boulder Canyon Project Act, or the Mexican Water Treaty or subject the United States to, or approve or disapprove any interpretation of, said compacts, statute, or treaty, anything in this act to the contrary notwithstanding."

No. 4

4. Proposed new section re quality of water studies:

"SEC. —. The Secretary of the Interior is directed to institute studies and to make a report to the Congress and to the States of the Colorado River Basin of the effect upon the quality of water available at Lee Ferry, of all transmountain diversions of water of the Colorado River System and of all other uses of the waters of that system now existing, authorized or proposed to be made in the upper Colorado River Basin including those proposed to be made under the authority of this act."

No. 5

5. Proposed new section re litigation and State water rights:

"SEC. —. In the construction, operation, and maintenance of all facilities authorized by Federal law and under the jurisdiction and supervision of the Secretary of the Interior for the utilization of waters of the Colorado River System, including but not limited to all works authorized by this act, the Secretary is directed to comply with the applicable provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, the Colorado River Storage Project Act, the Treaty with the United Mexican States, and any contract lawfully entered into by the United States under any of said acts, or of this act, in the storage and release of waters, and to comply with the laws of the States in which such waters are used relating to the control, appropriation, use and distribution of water in those States respectively. In the event of the failure of the Secretary of the Interior to so comply, any State of the Colorado River Basin may maintain an action in the Supreme Court of the United States to enforce the provisions of this section and consent is given to the joinder of the United States as a party in such suit or suits, as a defendant or otherwise. Consent to joinder of the United States is likewise given in any suit, action or proceeding brought in any court of competent jurisdiction upon any cause of action arising under any contract lawfully entered into by the United States pursuant to either of the compacts or the acts mentioned in this section."

No. 6

6. Proposed new section re limitation on transmountain diversions.

"SEC. —. 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 unless and until the State of New Mexico, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, California, 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 (measured at the point of diversion from the natural basin of the Colorado River system) by or in the State of New Mexico of water of and from the Colorado River system by means of transmountain diversion from the natural basin of that system to any other drainage basin shall not exceed 20 percent of the apportionment to which the State of New Mexico may be entitled pursuant to article III(a) of the Upper Colorado River Basin compact, subject to the provisions of the Colorado River compact and to the availability of water thereunder, and the President by public proclamation shall have declared that such act of the Legislature of New Mexico has been duly enacted and is effective."

ATTACHMENT 3

SANTA FE, N. MEX., *July 21, 1960.*

Hon. CLINTON P. ANDERSON,
U.S. Senate, Washington, D.C.

DEAR SENATOR ANDERSON: Your letter of July 10 requests the comments of the State of New Mexico on a series of proposed amendments to S. 3648 which were submitted by Senator Kuchel on behalf of the Colorado River Board of California.

New Mexico's comments on the proposed amendments are as follows:

AMENDMENTS TO SECTION 1

The stated purpose of the proposed amendments is "to clear up any possible confusion by making it plain that only the initial stage is approved, and that only that stage is intended to be authorized." New Mexico believes that S. 3648 in its present form clearly authorizes only the initial stage of the San Juan-Chama project for the diversion of an average of 110,000 acre-feet per annum. New Mexico also believes that congressional approval of the ultimate project for the diversion of an average of 235,000 acre-feet per annum is necessary to give the Secretary of the Interior authority to provide excess capacity in the initial stage tunnel and conduit works to accommodate possible subsequent stages of the project. If the 235,000 acre-foot project is not approved, the legislation authorizing the initial stage might later be interpreted to require the most economic construction of the initial stage with no excess capacity provided.

The necessity for including excess capacity in the works of the initial stage project is discussed at pages 11 and 12 of the statement presented to your subcommittee on July 9 by S. E. Reynolds and John H. Bliss. That discussion is quoted here for your convenience.

"Senate bill 3648, in addition to authorizing an initial stage of the San Juan-Chama project for an average annual diversion of 110,000 acre-feet, would give congressional approval of an ultimate plan for a diversion averaging 235,000 acre-feet per year. The Secretary of the Interior's 1955 feasibility report on the San Juan-Chama project describes such a plan and shows it to be feasible. However, estimates of anticipated power revenue credits available to New Mexico, as set forth in the Secretary's 'Financial and Economic Analysis of the Colorado River Storage Project' make it appear that a number of years must elapse before construction beyond an initial stage for the diversion of 110,000 acre-feet can be undertaken. It is impossible to know at this time whether the 125,000 acre-feet per year which might be imported to the Rio Grande by subsequently authorized stages of the project will ultimately be more urgently needed in the San Juan Basin. For this reason New Mexico seeks authorization for only the initial stage constructed in substantial accordance with the plan described in the 1957 supplemental report.

"The Secretary's 1955 feasibility report tabulates additional water requirements in the Rio Grande Basin amounting to 315,000 acre-feet per year presently, and 341,500 acre-feet per year within 50 years. Potential requirements which have come to light since the compilation of the report through notices of intention filed with the State engineer include 50,000 acre-feet per year for defense activities and related requirements in the Tularosa Basin for New Mexico, 5,000 acre-feet per year for the city of Santa Fe, and 3,000 acre-feet per year for the city of Los Alamos. We are filing with this statement copies of these notices of intention and a notice of intention filed by the city of Albuquerque.

"In view of the foregoing there can be no doubt that it may be necessary to import up to 235,000 acre-feet per year for high order uses in the Rio Grande Basin. Accordingly, the State considers it essential that the capacity of the conduit system of the initial stage of the diversion project be adequate to accommodate a possible ultimate diversion averaging 235,000 acre-feet per annum. If the tunnel and conduit system of the initial stage is constructed for a diversion averaging only 110,000 acre-feet per year, the construction costs of the initial stage could be reduced by about $2.8 million, but the importation of additional amounts of water would then require paralleling of the original tunnel and conduit system. The cost of providing the additional capacity would then amount to about $15 million as compared to $2.8 million under the plan advanced in the supplemental report.

"It is recognized that, if the contemplated future needs in the Rio Grande Basin are not met with San Juan water, about $2.8 million of the initial stage construction costs for tunnel and conduit capacity over and above that required for the diversion of 110,000 acre-feet per year will have to be met with power revenue credits allocated to New Mexico. The State feels amply justified in this commitment of power revenue credits to maintain flexibility in the distribution of its water resources."

New Mexico considers the proposed amendments to section 1 of S. 3648 to be unacceptable.

AMENDMENT TO SECTION 6

The first purpose of the proposed amendment to section 6 is to provide a disclaimer of any commitment to the ultimate stage of the San Juan-Chama diversion project. S. 3648 in its present form clearly does not commit either the Federal Government or the State to subsequent stages of the project. However, congressional approval of the ultimate project does make it possible for the State to seek authorization of subsequent stages of the project if such stages appear desirable at a later time. The State considers such approval essential for the reasons that are set forth above.

The Colorado River Board of California states that the second purpose of the amendment to section 6 is to "avoid the problems which can result for other basin works in the extreme variations in diversions which may be made * * *." I can find no foundation for California's touching concern over the possible detrimental effects of transmountain diversions on other upper basin water uses. I have touched on this problem at pages 9 and 10 of the statement which I presented to your subcommittee on July 9. That discussion is reproduced here for your convenience.

"The main storage reservoir of the San Juan-Chama project will be constructed in the Rio Grande Basin on the east side of the Continental Divide. It will be necessary, in years when the San Juan River has a good water supply, to export and store amounts of water substantially greater than the average annual diversion in order that the needs of water users under the project can be met in years when little water is available for exportation. While the amount of water exported may vary widely from year to year, the annual amount drawn from storage will, of course, be fairly uniform.

"In her comments California appears to contend that water exported from the upper basin must be accounted as a consumptive use in the year exported even though the water is stored out of the basin for use in a later year. California further contends that with exported water thus accounted for the total consumptive use in the upper basin may not exceed 7.5 million acre-feet in any year. California's implication is that, when consumptive uses in the upper basin approach the limit allowed by the 1922 compact, it would be necessary to reduce in-basin consumptive use in years when larger than average amounts of water are exported for out-of-basin storage.

"New Mexico takes the position that, even if article III(a) of the compact were construed to set the upper limit of beneficial consumptive use in any year rather than the average, it is perfectly clear that water which has been exported and stored has not been applied to beneficial consumptive use any more than water stored within the basin. Water cannot properly be accounted as beneficially consumed under the provisions of the compact until it has been released from storage for use or is actualy consumed by evaporation.

"It is obvious that California cannot in good conscience request the impossible. The 1922 compact is not a one-way street, but is a solemn agreement between the States of the basin providing for and guaranteeing the water requirements for all of the States."

California's interests in this matter are fully protected by the Colorado River compact and the other States of the upper basin are fully protected by the Upper Colorado River Basin compact. Attention is specifically invited to article IV(b) of the latter compact which reads as follows: "If any State or States of the upper division, in the 10 years immediately preceding the water year in which curtailment is necessary, shall have consumptively used more water than it was or they were, as the case may be, entitled to use under the apportionment made by article III of this compact, such State or States shall be required to supply at Lee Ferry a quantity of water equal to its, or the aggregate of their, overdraft or the proportionate part of such overdraft, as may be necessary to assure compliance with article III of the Colorado River compact, before demand is made on any other State on the upper division."

A provision limiting the transmountain diversion to an aggregate of 1,100,000 acre-feet in any period of 10 consecutive years would make it impossible for the project to make the best possible use of the storage to be constructed in the Rio Grande Basin and would induce unnecessary shortages adversely affecting project feasibility and operation. New Mexico finds the proposed amendment to section 6 unacceptable.

PROPOSED NEW SECTION SUBJECTING PROJECTS TO THE LAW OF THE RIVER

Subsection (a) appears only to make the use of water under the projects to be authorized subject to the law of the river. New Mexico's only objection to such provision would be that it amounts only to a reiteration of section 14 of Public Law 485 and is, therefore, unnecessary. However, the State would not press this objection. It also appears that the Boulder Canyon Project Act has no applicability to water uses under the project to be authorized by S. 3648 and, that, reference to that act should be deleted from subsection (a).

Since Public Law 485 reaffirms that the uses that would be authorized by S. 3648 are subject to the law of the river subsection (b) of the proposed new section also appears to be superfluous. It does appear that subsection (b) might facilitate and encourage a multiplicity of suits and New Mexico, therefore, finds this subsection unacceptable.

Subsection (c) of the proposed amendment would provide that no waters exported from the Colorado River system shall be made available for consumptive use in any State not a party to the Colorado River compact by exchange or substitution or by use of return flow.

I have discussed this question at pages 8 and 9 of the statement which I presented to your subcommittee on July 9, and that discussion is reproduced here for your convenience.

"The amendment recommended by California would provide that none of the waters of the Colorado River system shall be made available for consumptive use in any State not a party to the Colorado River compact by exchange, substitution, or return flow. Any transmountain diversion results in commingling imported waters with inbasin waters. When the waters are once commingled the imported water cannot be used without involving, to some degree, substitution or exchange with inbasin water. In the instance of almost every possible upper basin transmountain diversion there are downstream States, not parties to the Colorado River compact, which have rights to a portion of the inbasin waters and, therefore, substitution or exchange of imported water for inbasin water in which other States may have rights, is inescapable. The Colorado River compact provides for transmountain diversion projects and thus by any commonsense construction of its provisions permits substitution or exchange. New Mexico maintains her right to substitute or exchange Colorado River water for Rio Grande water in which Texas may have a right.

"California asserts that New Mexico would violate the Colorado River compact should one drop of return flow from imported Colorado River water pass down the Rio Grande to another State. New Mexico believes that, if the imported water is put to beneficial use within her boundaries, the escape of return flow to Texas would not constitute a violation of the 1922 compact. However, New Mexico contemplates that in this instance the imported water will be so measured and managed that its equivalent will be fully consumed within the State."

I would amplify the above comments by pointing out that the metropolitan water district exports large amounts of Colorado River water for municipal and industrial use and that a large portion of that exported water is wasted to the Pacific Ocean as effluent from sewage-treatment plants or return flow. It appears ridiculous to hold that return flow wasted to the Pacific Ocean does not constitute a violation of the Colorado River compact while return flow escaping past New Mexico's borders for possible beneficial use in another State does constitute such a violation.

New Mexico finds subsection (c) of the proposed new section unacceptable.

New Mexico has no objection to subsection D of the proposed new section, but suggests that reference to the Boulder Canyon project be deleted since this act has no application to water uses under the projects to be authorized.

PROPOSED NEW SECTION RE QUALITY OF WATER STUDIES

New Mexico believes that this amendment would direct the Secretary of the Interior to institute studies which are impracticably broad in scope, especially inasmuch as he would be directed to study the effects of indefinite, proposed water uses throughout the Colorado River system. However, New Mexico is in accord with the general purpose of this amendment and would not press objection to the amendment in its present form.

PROPOSED NEW SECTION RE LITIGATION AND STATE WATER RIGHTS

New Mexico strenuously objects to this proposed new section and adopts all of the objections set forth in the Assistant Secretary of the Interior's letter of July 24, 1957, to Hon. Clare Engle (see pp. 168 and 170 inclusive, hearings, H.R. 594, serial No. 11) insofar as those objections are applicable to the amendment in the form proposed. A copy of that letter is attached hereto for your convenience.

The proposed amendment would accomplish substantial changes in the law of the river and also would attempt to resolve conflicts between the water right laws of the States and the Federal Government in the Colorado River Basin. Regardless of the merits of the enactment of such legislation, a bill authorizing individual projects is not the proper vehicle. From a selfish point of view New Mexico would point out that Senator Barrett's "Water Rights Settlement Act" (S. 863) which attempts to resolve these conflicts, has been before the Congress for more than 2 years and the issues involved in that proposed legislation appear far from resolved. It is not fair to delay the authorization of projects which are vital to New Mexico by involving in S. 3648 these unresolved issues.

PROPOSED NEW SECTION RE LIMITATION ON TRANSMOUNTAIN DIVERSIONS

This proposed section is in effect an amendment of the Colorado River compact of 1922. Even if such an amendment were desirable, the incorporation of the proposed section in S. 3648 would be an improper procedure for accomplishing the compact amendment. The Colorado River Board of California apparently proposes this section because of its concern over the effect of transmountain diversions on the quality of water available for use in the lower basin. This concern is ill founded. I have discussed the subject of the effect of transmountain diversions on quality of water in the statement which I presented to your subcommittee on July 9 and this discussion is reproduced here for your convenience.

"The State of New Mexico and the other States of the upper Colorado River Basin intend to comply fully with the several documents which comprise the law of the river. Public Law 485 (the Colorado River Storage Project Act of 1956) reaffirms these documents. A reiteration of their principles in the present legislation is unnecessary because the law of the river is already clearly established.

"The Colorado River compact of 1922 allocated '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.' The compact also stated that 'present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact.' This latter is a simple declaration of fact. It is self-evident that the consumptive use of 7,500,000 acre-feet of water above Lee Ferry will inevitably change both the quantity and quality of the remaining flows to the lower basin and the signatories agreed that these changes would not impair present perfected rights. Aside from this, however, the assumed detriment to the lower basin users by reason of transmountain diversions of 'good quality' water is a misconception which should be laid to rest once and for all time.

"The mechanics of successful irrigation require that dissolved solids in the water be flushed out by drainage and return flows to the stream; otherwise the salts would accumulate in the soils and the growing of crops would soon become impossible. Thus the water is consumed while the dissolved solids are retained in the residual stream flows. Since transmountain diversions remove both salts and water from the basin, the remaining supply is actually of better quality

than would result had the same water been consumed in the basin. Thus California appears to be misguided, or misguiding, when she focuses her objections on transmountain diversion projects."

The proportion of New Mexico's rightful share of the waters of the Colorado River system which is devoted to transmountain diversion projects is not a proper concern of the Colorado River Board of California.

Your courtesy in providing New Mexico the opportunity to comment on the amendments proposed by the Colorado River Board of California is sincerely appreciated.

Sincerely,

E. L. MECHEM,
Governor of New Mexico.

ATTACHMENT 4

FEBRUARY 12, 1958.

Hon. ED MECHEM,
Governor of New Mexico,
Santa Fe, N. Mex.

DEAR GOVERNOR MECHEM: I am writing in connection with the comments to be made by the State of Colorado on the project reports on the proposed San Juan-Chama and Navajo projects. As you know, our water board is meeting to consider these comments on Monday, February 17, 1958. We are advised that some of our citizens in southwestern Colorado will present proposed comments which would be considered by you to be adverse to the San Juan-Chama project. These proposed objections are based on the grounds of inadequate water supply within the share of Colorado River water allotted to New Mexico under the compacts, and the feeling that the inadequate supply and inadequate power credits after construction of the San Juan-Chama project will preclude New Mexican participation in the Animas-La Plata project, in which we are greatly interested. It appears that the basis of the most serious fears of our citizens are water supply estimates which disagree with those which have been proposed by those favoring the San Juan-Chama project.

In recognition of the longstanding unanimity of action and purpose between our two States on reclamation matters, Colorado is most hopeful that no unnecessary action will be taken which would damage New Mexico or Colorado interests. I am sure you feel the same way in this regard. There may be a good possibility that further joint consideration of the questions of water supply and power credits which are involved in this matter may well disclose that there is, in fact, no real conflict between these projects which is incapable of satisfactory solution.

Hence, in order to aid me in assuring our people of the fact that you reciprocate in the desire to further New Mexico-Colorado joint interests, I would very much appreciate receiving from you assurances as follows:

That in the event Colorado comments favorably on the San Juan-Chama and Navajo projects, without reference to the water supply or power credit questions, you will appoint a commissioner or commissioners to enter into detailed consideration with our representatives of the questions of water supply and power credit availability involved in the San Juan-Chama, Navajo and Animas-La Plata projects, in an effort to agree upon water supply and power credit bases for consideration of the ability of the State of New Mexico to participate in the Animas-La Plata project. If it is determined from this that a conflict exists, then you will, as I shall, resolve that conflict to the satisfaction of all our interested citizens. If that is not possible, then I feel each State will then have to determine what course it will be necessary to follow to best protect its interests. I hope to avoid, and think we can avoid, this latter result by this suggested cooperative effort.

It is understood that any such negotiation shall not be used to impede, in any way, the progress you are able to make with the adoption of the legislation authorizing these projects. However, I do believe that this is the least we can do to attempt to continue our historical unity on matters of this kind, and that we can do this without impairing any legitimate interest of any of the citizens of our respective States.

As has been stated at an earlier meeting between representatives of both New Mexico and Colorado, there are some comments that may be made in an effort to clarify the status of Indian claims under the Navajo project, but it is my

understanding that you will not find these comments objectionable, as there is no issue, but only a question of clarification.

I am very hopeful that all of these matters can be resolved by the interested parties on the above basis. We can cooperate completely with you, and you can cooperate completely with us, and the necessity of doing so outweights any fear of injury that may exist. However, if I am not able to do so, I suggest we get together personally and discuss the matter further in an effort to resolve any and all unsolved problems.

Your cooperation in this matter is very much appreciated.

Sincerely,

———— ————.

ATTACHMENT 5

SANTA FE, N. MEX., *February 14, 1958.*

HON. STEPHEN L. R. MCNICHOLS,
Governor of Colorado,
Denver, Colo.

DEAR GOVERNOR MCNICHOLS: I am appreciative of your sincere effort to resolve the problems which have arisen from the concern of interests in southwestern Colorado. Under the conditions set forth in your letter of February 12, 1958, and with the understanding that you intend to submit Colorado's official comments on the San Juan-Chama and Navajo projects without delay, I would be pleased to appoint commissioners for the purposes outlined in your letter.

I confidently expect Colorado's continued active cooperation in the development of the water resources of the Upper Colorado River Basin including the development of New Mexico's allocation. You may be confident that New Mexico will fully reciprocate.

Sincerely,

E. L. MECHEM.

ATTACHMENT 6

86TH CONGRESS
1st Session

S. 72

IN THE SENATE OF THE UNITED STATES

JANUARY 9 (legislative day, JANUARY 8), 1959

Mr. ANDERSON (for himself and Mr. CHAVEZ) introduced the following bill; which was read twice and referred to the Committee on Interior and Insular Affairs

A BILL

To authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, 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 purposes of furnishing water for irrigation [or] *of* irrigable and arable lands, municipal, domestic and industrial uses (and for other beneficial purposes), providing recreation and fish and wildlife benefits, controlling silt, the Congress hereby approves as participating projects of the Colorado River storage project the Navajo Indian irrigation project, New Mexico, and the *initial stge of the* San Juan-Chama project, Colorado-New Mexico[.], *as conditioned, modified, and limited herein.* Principal engineering works of the Navajo Indian irrigation project shall be a main gravity canal, tunnels, siphons, pumps, and powerplants for project purposes, laterals, drains, distribution systems and related works. The *initial stage of the* San Juan-Chama project facilities shall be comprised principally of regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works.

The Navajo Indian irrigation project and the *initial stage of the* San Juan-Chama project herein approved are substantially those described in the proposed coordinated report of the Acting Commissioner of Reclamation and the Commis-

sioner of Indian Affairs, approved and adopted by the Secretary of Interior on October 16, 1957[.], *as conditioned, modified and limited herein.*

SEC. 2. Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain the Navajo Indian irrigation project for the principal purpose of furnishing irrigation water to approximately one hundred and ten thousand six hundred and thirty acres of land, [said project to have an average annual diversion of five hundred and eight thousand acre-feet of water,] the repayment of the costs of construction thereof to be in accordance with the provisions of said Act of April 11, 1956 (70 Stat. 105), including, but not limited to, section 4(d) thereof: *Provided, however, That the Secretary of the Interior shall so operate the project and Navajo Reservoir that the waters of the San Juan River entering or stored in Navajo Reservoir shall be first utilized to satisfy existing or future downstream water requirements in the State of New Mexico which would otherwise constitute demands or obligations against the State of Colorado under the terms of the Upper Colorado River Basin compact (Stat.) for the release of waters originating in Colorado on tributary streams entering the San Juan River below Navajo Dam, in excess of those demands and obligations created by the La Plata River compact (Stat.): And provided further, That the Secretary of the Interior shall so operate the project that the diversions for Indian lands shall not exceed five hundred and eight thousand acre-feet of water in any year starting with the first day of October after the project shall have commenced operation.*

SEC. 3. (a) In order to provide for the most economical development of the Navajo irrigation project, the Secretary of the Interior is hereby authorized and directed to declare by publication in the Federal Register that the United States of America holds in trust for the Navajo Tribe of Indians any legal subdivisions or unsurveyed tracts of federally owned land outside the present boundary of the Navajo Indian Reservation in New Mexico in townships 28 and 29 north, ranges 10 and 11 west, and townships 27 and 28 north, ranges 12 and 13 west, New Mexico principal meridian, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project: *Provided, however,* That no such legal subdivision or unsurveyed tract shall be so declared to be held in trust by the United States for the Navajo Tribe until the Navajo Tribe shall have paid the United States the full appraised value thereof: *And provided further,* That in making appraisals of such lands the Secretary of the Interior shall consider their values as of the date of approval of this Act, excluding therefrom the value of minerals subject to leasing under the Act of February 25, 1920, as amended (30 U.S.C. 181–286), and such leasable minerals shall not be held in trust for the Navajo Tribe and shall continue to be subject to leasing under the Act of February 25, 1920, as amended, after the lands containing them have been declared to be held in trust by the United States for the Navajo Tribe.

(b) The Navajo Tribe is hereby authorized to convey to the United States, and the Secretary of the Interior is hereby directed to accept on behalf of the United States, title to any land or interest in land within the above-described township, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, acquired in fee simple by the Navajo Tribe, and after such conveyance said land or interest in land shall be held in trust by the United States for the Navajo Tribe as a part of the Navajo Indian irrigation project.

(c) The Secretary of the Interior is hereby authorized and directed to acquire by purchase, exchange, or condemnation any other land or interest in land within the townships above described susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project. After such acquisition, said lands or interest in lands shall be held by the United States in trust for the Navajo Tribe of Indians and the price of such lands or interest in lands or of the land given in exchange therefor by the United States shall be charged to funds of the Navajo Tribe of Indians on deposit in the Treasury of the United States.

SEC. 4. In developing the Navajo Indian irrigation project, the Secretary is authorized to provide capacity for municipal and industrial water supplies or miscellaneous purposes over and above the diversion requirements for irrigation stated in section 2 of this Act. But such additional capacity shall not be constructed and no appropriation of funds for such construction shall be made unless, prior thereto, contracts have been executed which, in the judgment of the Secretary, provide satisfactory assurance of repayment of all costs properly allocated to the purposes aforesaid with interest as provided by law.

SEC. 5. Payment of operation and maintenance charges of the irrigation features of the Navajo Indian irrigation project shall be in accordance with the provisions of the Act of August 1, 1914 (38 Stat. 582, 583), as amended by the Act of August 7, 1946 (60 Stat. 867): *Provided*, That the Secretary of the Interior in his discretion may transfer to the Navajo Tribe of Indians the care, operation, and maintenance of all or any part of the Navajo Indin irrigation project works, subject to such rules and regulations as he may prescribe, and, in such event, the Secretary may transfer to the Navajo Tribe title to movable property necessary to the operation and maintenance of project works.

SEC. 6. [a] Pursant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain [an] *the* initial stage of the San Juan-Chama project, Colorado-New Mexico, for the principal purposes of furnishing water supplies to approximately thirty-nine thousand three hundred acres of land in Cerro, Taos, Llano, and Pojoague tributary irrigation units in the Rio Grande Basin, about eighty-one thousand six hundred acres of land in the existing Middle Rio Grande Conservancy District, and municipal, domestic, and industrial uses, and providing recreation and fish and wildlife benefits[, said initial stage to have an average annual diversion of one hundred and ten thousand acre-feet of water]. *Said construction and operation of the diversion facilities to include only natural flow of the Navajo, Little Navajo, and Blanco Rivers in Colorado as set forth in the supplemental project report dated May 1957.* Principal engineering works of the initial stage development involving three major elements, shall include diversion dams and conduits, storage and regulation facilities at the Heron Numbered 4 Reservoir site and enlargement of outlet works of the existing El Vado Dam and water use facilities consisting of reservoirs, dams, canals, lateral and drainage systems, and associated works and appurtenances. The construction of recreation facilities at the Nambe Reservoir shall be contingent upon the Secretary's making appropriate arrangements with the governing body of the Nambe Pueblo for the operation and maintenance of such facilities, and the construction of recreation facilities at the Heron Numbered 4, Valdez, and Indian Camp Reservoirs shall be contingent upon the Secretary's making appropriate arrangements with a State or local agency or organization for the operation and maintenance of those facilities: *Provided*, That—

(a) The Secretary of the Interior shall so operate the project that diversions to the Rio Grande Valley shall not exceed 1,100,000 acre-feet of water in any period of ten consecutive years, reckoned in continuing progressive series starting with the first day of October after the project shall have commenced operation.

(b) The Secretary of the Interior shall operate the project so that there shall be no injury, impairment, or depletion of existing or future beneficial uses of water within the State of Colorado, the use of which is within the apportionment made to the State of Colorado by article III of the upper Colorado River Basin compact.

[i] (*c*) all works of the project[, both in its initial stage and in its final development,] shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact.

[ii] (*d*) the amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year.

[iii] (*e*) details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided*, That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this subsection shall be incorporated in

a written report transmitted to the States of Colorado, Texas, and New Mexico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction.

(f) The Secretary of the Interior shall operate the project so that there will be no depletion of the flows of the Navajo River or the Blanco River below the quantity of water necessary for the preservation of fish and aquatic life as reported by the Fish and Wildlife Service in the San Juan-Chama project report dated November 1955.

[(b) The Secretary of the Interior is hereby authorized to construct the tunnel and conduit works of the initial stage of the San Juan-Chama project with sufficient capacity for future diversion of an average of two hundred and thirty-five thousand acre-feet per annum, and to recognize the cost of providing such additional capacity as a deferred obligation to be paid at such time as the additional capacity may be required.]

SEC. 7. (a) No person shall have or be entitled to have the use for any purpose, including uses under the Navajo Indian irrigation project and [the initial stage of] the San Juan-Chama project authorized by sections 2 and 6 [a] of this Act, of water stored in Navajo Reservoir or of any other waters of the San Juan River and its tributaries originating above Navajo Reservoir to the use of which the United States is [entitled] *entitled, under these projects,* except that under contract satisfactory to the Secretary of the Interior and conforming to the provisions of this Act. Such contracts, which, in the case of water for Indian uses, shall be executed with the Navajo Tribe, shall make provision, in any year in which the Secretary anticipates a shortage taking into account both the prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for a sharing of the available water in the following manner: The prospective runoff shall be apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each group bears to the the total of all normal diversion requirements. In the case of contractors diverting above Navajo Reservoir, each such contract shall provide for a sharing of the runoff apportioned to said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts that have been made hereunder: *Provided*, That for any year in which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of his diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to said group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the proportion that the normal diversion requirements of each bears to the total normal diversion requirements of the group. In the case of contractors diverting from or below Navajo Reservoir, each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts that have been made hereunder.

The Secretary shall not enter into contracts beyond a total amount of water that, in his judgment, in the event of shortage will result in a reasonable amount being available for the diversion requirements for the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as specified in sections 2 and 6[a] of this Act.

(b) In the event contracts are entered into for delivery from storage in Navajo Reservoir of water not covered by subsection (a) of this section, such contracts shall be subject to the same provision for sharing of available water supply in the event of shortage as in the case of contracts required to be made pursuant to subparagraph (a) of this section.

(c) This section shall not be applicable to the water requirements of the existing Fruitland, Hogback, Cudai, and Cambridge Indian irrigation projects, nor to the water required in connection with the extension of the irrigated acreages of the Fruitland and Hogback Indian irrigation projects in a total amount of approximately eleven thousand acres.

SEC. 8(a) None of the project works, or structures authorized by this Act shall be operated by the Secretary of the Interior so as to create, implement, or satisfy any preferential right in the United States or any Indian tribe to the waters impounded, diverted or used by means of such project works or structures, other than contained in those rights to the uses of water granted to the

State of New Mexico pursuant to the provisions of the Upper Colorado River Basin compact.

(b) The Secretary of the Interior shall operate the projects authorized by this Act so that no waters shall be diverted or used by means of the project works, which, together with all other waters used in or diverted from the San Juan River Basin in New Mexico, will exceed the water available to the State of New Mexico under the allocation contained in article III of the Upper Colorado River Basin compact for any compact year.

[SEC. 8.] *Sec. 9.* Section 12 of the Act of April 11, 1956, 70 Stat. 105, shall not apply to the works authorized by this Act. There are hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated, such funds as may be required to carry out the purposes of this Act, but not to exceed $221,000,000 (January 1958 prices) plus such amounts, if any, as may be required by reason of changes in construction costs as indicated by engineering cost indexes applicable to the types of construction involved therein and, in addition thereto, such sums as may be required to operate and maintain the projects.

[SEC. 9.] *Sec. 10.* The Act of April 11, 1956 (70 Stat. 105), is hereby amended as follows: (i) In section 1, subsection (2), after "Central Utah (initial phase)" delete the colon and insert in lieu thereof a comma; (ii) in section 5, subsection (e) in the phrase "herein or hereinafter authorized" delete the word "hereinafter" and insert in lieu thereof the word "hereafter"; (iii) in section 7 in the phrase "any any contract lawfully entered unto under said Compacts and Acts" delete the word "unto" and insert in lieu thereof the word "into".

ATTACHMENT 7

86TH CONGRESS
1st Session

S. 72

IN THE SENATE OF THE UNITED STATES

JANUARY 9 (legislative day, JANUARY 8), 1959

Mr. ANDERSON (for himself and Mr. CHAVEZ) introduced the following bill; which was read twice and referred to the Committee on Interior and Insular Affairs

A BILL

To authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River Storage project, 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 purposes of furnishing water for irrigation [or] *of* irrigable and arable lands, municipal, domestic and industrial uses (and for other beneficial purposes), providing recreation and fish and wildlife benefits, controlling silt, the Congress hereby approves as participating projects of the Colorado River storage project the Navajo Indian irrigation project, New Mexico, and the *initial stage of the* San Juan-Chama project, Colorado-New Mexico[.], *as conditioned, modified, and limited herein.* Principal engineering works of the Navajo Indian irrigation project shall be a main gravity canal, tunnels, siphons, pumps, and powerplants for project purposes, laterals, drains, distribution systems and related works. The *initial stage of the* San Juan-Chama project facilities shall be comprised principally of regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works.

The Navajo Indian irrigation project and the *initial stage of the* San Juan-Chama project herein approved are substantially those described in the proposed coordinated report of the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, approved and adopted by the Secretary of Interior on October 16, 1957[.], *as conditioned, modified, and limited herein.*

SEC. 2. Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain the Navajo Indian irrigation project for the principal purpose of furnishing irrigation water to [approximately] *not to exceed* one hundred and ten thousand six hundred and thirty acres of land, [said project to have an average annual

diversion of five hundred and eight thousand acre-feet of water,] the repayment of the costs of construction thereof to be in accordance with the provisions of said Act of April 11, 1956 (70 Stat. 105), including, but not limited to, section 4(d) thereof: *Provided, however, That the Secretary of the Interior shall so operate the project and Navajo Reservoir so as not to interfere with the supply of downstream water requirements in the State of New Mexico in existence or authorized as of October 11, 1948: And provided further, That the Secretary of the Interior shall so operate the project that diversion to the project lands shall not exceed ten million one hundred and sixty thousand acre-feet in any period of twenty consecutive years, reckoned in continuing progressive series starting with the first day of October after the project shall have commenced operation.*

SEC. 3. (a) In order to provide for the most economical development of the Navajo irrigation project, the Secretary of the Interior is hereby authorized and directed to declare by publication in the Federal Register that the United States of America holds in trust for the Navajo Tribe of Indians any legal subdivisions or unsurveyed tracts of federally owned land outside the present boundary of the Navajo Indian Reservation in New Mexico in townships 28 and 29 north, ranges 10 and 11 west, and townships 27 and 28 north, ranges 12 and 13 west, New Mexico principal meridian, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project: *Provided, however,* That no such legal subdivision or unsurveyed tract shall be so declared to be held in trust by the United States for the Navajo Tribe until the Navajo Tribe shall have paid the United States the full appraised value thereof: *And provided further,* That in making appraisals of such lands the Secretary of the Interior shall consider their values as of the date of approval of this Act, excluding therefrom the value of minerals subject to leasing under the Act of February 25, 1920, as amended (30 U.S.C. 181–286), and such leasable minerals shall not be held in trust for the Navajo Tribe and shall continue to be subject to leasing under the Act of February 25, 1920, as amended, after the lands containing them have been declared to be held in trust by the United States for the Navajo Tribe.

(b) The Navajo Tribe is hereby authorized to convey to the United States, and the Secretary of the Interior is hereby directed to accept on behalf of the United States, title to any land or interest in land within the above-described townships, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, acquired in fee simple by the Navajo Tribe, and after such conveyance said land or interest in land shall be held in trust by the United States for the Navajo Tribe as a part of the Navajo Indian irrigation project.

(c) The Secretary of the Interior is hereby authorized and directed to acquire by purchase, exchange, or condemnation any other land or interest in land within the townships above described susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project. After such acquisition, said lands or interest in lands shall be held by the United States in trust for the Navajo Tribe of Indians and the price of such lands or interest in lands or of the land given in exchange therefor by the United States shall be charged to funds of the Navajo Tribe of Indians on deposit in the Treasury of the United States.

SEC. 4. In developing the Navajo Indian irrigation project, the Secretary is authorized to provide capacity for municipal and industrial water supplies or miscellaneous purposes over and above the diversion requirements for irrigation stated in section 2 of this Act. But such additional capacity shall not be constructed and no appropriation of funds for such construction shall be made unless, prior thereto, contracts have been executed which, in the judgment of the Secretary, provide satisfactory assurance of repayment of all costs properly allocated to the purposes aforesaid with interest as provided by law.

SEC. 5. Payment of operation and maintenance charges of the irrigation features of the Navajo Indian irrigation project shall be in accordance with the provisions of the Act of August 1, 1914 (38 Stat. 582, 583), as amended by the Act of August 7, 1946 (60 Stat. 867): *Provided,* That the Secretary of the Interior in his discretion may transfer to the Navajo Tribe of Indians the care, operation, and maintenance of all or any part of the Navajo Indian irrigation project works, subject to such rules and regulations as he may prescribe, and, in such event, the Secretary may transfer to the Navajo Tribe title to movable property necessary to the operation and maintenance of project works.

SEC. 6. [(a)] Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and main-

tain [an] *the* initial stage of the San Juan-Chama project, Colorado-New Mexico, for the principal purposes of furnishing water supplies to approximately thirty-nine thousand three hundred acres of land in Cerro, Taos, Llano, and Pojoaque tributary irrigation units in the Rio Grande Basin, about eighty-one thousand six hundred acres of land in the existing Middle Rio Grande Conservancy District, and municipal, domestic, and industrial uses, and providing recreation and fish and wildlife benefits. [Said initial stage to have an average annual diversion of one hundred and ten thousand acre-feet of water.] *Said construction and operation of the diversion facilities of the initial stage authorized herein shall include only natural flow of the Navajo, Little Navajo, and Blanco Rivers in Colorado as set forth in the supplemental project report dated May 1957.* Principal engineering works of the initial stage development involving three major elements, shall include diversion dams and conduits, storage and regulation facilities at the Heron Numbered 4 Reservoir site and enlargement of outlet works of the existing El Vado Dam, and water use facilities consisting of reservoirs, dams, canals, lateral and drainage systems, and associated works and appurtenances. The construction of recreation facilities at the Nambe Reservoir shall be contingent upon the Secretary's making appropriate arrangements with the governing body of the Nambe Pueblo for the operation and maintenance of such facilities, and the construction of recreation facilities at the Heron Numbered 4, Valdez, and Indian Camp Reservoirs shall be contingent upon the Secretary's making appropriate arrangements with a State or local agency or organization for the operation and maintenance of those facilities: *Provided*, That—

(a) The Secretary of the Interior shall so operate the initial stage of the project as herein authorized that diversions to the Rio Grande Valley shall not exceed 1,350,000 acre-feet of water in any period of ten consecutive years, reckoned in continuing progressive series starting with the first day of October after the project shall have commenced operation.

(b) The Secretary of the Interior shall operate the project so that there shall be no injury, impairment, or depletion of existing or future beneficial uses of water within the State of Colorado, the use of which is within the apportionment made to the State of Colorado by article III of the Upper Colorado River Basin compact, as provided by article IX of the Upper Colorado River Basin Compact and article IX of the Rio Grande Compact.

[(1)] *(c)* All works of the project [, both in its initial stage and in its final development,] shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact.

[(i)] *(d)* The amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year.

[(iii)] *(e)* Details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided*, That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this subsection shall be incorporated in a written report transmitted to the States of Colorado, Texas, and New Mexico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction.

(f) The Secretary of the Interior shall operate the project so that there will be no depletion of the flows of the Navajo River or the Blanco River below the quantity of water necessary for the preservation of fish and aquatic life as reported by the Bureau of Reclamation in the supplemental project report dated May 1957.

[(b)] *(g)* The Secretary of the Interior is hereby authorized to construct the tunnel and conduit works of the initial stage of the San Juan-Chama project

with sufficient capacity for future diversion of an average of two hundred and thirty five thousand acre-feet per annum, and to recognize the cost of providing such additional capacity as a deferred obligation to be paid at such time as the additional capacity may be required: *Provided, however, that nothing contained in this Act shall be construed as committing the Congress of the United States to future authorization of any additional stage of the San Juan-Chama project.*

SEC. 7. (a) No person shall have or be entitled to have the use for any purpose, including uses under the Navajo Indian irrigation project and [the initial stage of] the San Juan-Chama project authorized by sections 2 and 6[(a)] of this Act, of water stored in Navajo Reservoir or of any other waters of the San Juan River and its tributaries originating above Navajo Reservoir to the use of which the United States is [entitled] *entitled, under these projects,* except under contract satisfactory to the Secretary of the Interior and conforming to the provisions of this Act. Such contracts, which, in the case of water for Indian uses, shall be executed with the Navajo Tribe, shall make provision, in any year in which the Secretary anticipates a shortage taking into account both the prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for a sharing of the available water in the following manner: The prospective runoff shall be apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each group bears to the total of all normal diversion requirements. In the case of contractors diverting above Navajo Reservoir, each such contract shall provide for a sharing of the runoff apportioned to said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts that have been made hereunder: *Provided,* That for any year in which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of his diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to said group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the proportion that the normal diversion requirements of each bears to the total normal diversion requirements of the group. In the case of contractors diverting from or below Navajo Reservoir, each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts that have been made hereunder.

The Secretary shall not enter into contracts beyond a total amount of water that, in his judgment, in the event of shortage will result in a reasonable amount being available for the diversion requirements for the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as specified in sections 2 and 6 [(a)] of this Act.

(b) In the event contracts are entered into for delivery from storage in Navajo Reservoir of water not covered by subsection (a) of this section, such contracts shall be subject to the same provision for sharing of available water supply in the event of shortage as in the case of contracts required to be made pursuant to subparagraph (a) of this section.

(c) This section shall not be applicable to the water requirements of the existing Fruitland, Hogback, Cudai, and Cambridge Indian irrigation projects, nor to the water required in connection with the extension of the irrigated acreages of the Fruitland and Hogback Indian irrigation projects in a total amount of approximately eleven thousand acres.

(d) This section shall not be applicable to water rights established prior to October 11, 1948.

SEC. 8. (a) None of the project works, or structures authorized by this Act shall be operated by the Secretary of the Interior so as to create, implement, or satisfy any preferential right in the United States or any Indian tribe to the waters impounded, diverted, or used by means of such project works or structures, other than contained in those rights to the uses of water granted to the States of New Mexico or Arizona pursuant to the provisions of the Upper Colorado River Basin compact.

(b) The Secretary of the Interior shall operate the projects authorized by this Act so that no waters shall be diverted or used by means of the project works, which, together with all other waters used in or diverted from the San Juan River Basin in New Mexico, will exceed the water available to the States

of New Mexico and Arizona under the allocation contained in article III of the Upper Colorado River Basin compact for any water year.

[SEC. 8.] *Sec. 9.* Section 12 of the Act of April 11, 1956, 70 Stat. 105, shall not apply to the works authorized by this Act. There are hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated, such funds as may be required to carry out the purposes of this Act, but not to exceed $221,000,000 (January 1958 prices) plus such amounts, if any, as may be required by reason of changes in construction costs as indicated by engineering cost indexes applicable to the types of construction involved therein and, in addition thereto, such sums as may be required to operate and maintain the projects.

[SEC. 9.] *Sec. 10.* The Act of April 11, 1956 (70 Stat. 105) is hereby amended as follows: (i) In section 1, subsection (2), after "Central Utah (initial phase)", delete the colon and insert in lieu thereof a comma; (ii) in section 5, subsection (e) in the phrase "herein or hereinafter authorized" delete the word "hereinafter" and insert in lieu thereof the word "hereafter"; (iii) in section 7 in the phrase "and any contract lawfully entered unto under said Compacts and Acts" delete the word "unto" and insert in lieu thereof the word "into".

ATTACHMENT 8

CHANGES MADE BY COLORADO IN SANTA FE DRAFT (FEBRUARY 3, 1960) OF S. 72 PRIOR TO APPROVAL BY THE COLORADO WATER CONSERVATION BOARD

Change 1, section 2

"*Provided, however,* That the Secretary of the Interior shall operate the project and Navajo Reservoir so that the waters of the San Juan River entering or stored in Navajo Reservoir shall be first utilized to satisfy downstream water requirements in the State of New Mexico authorized or in existence as of October 11, 1948, which requirements may otherwise constitute demands or obligations against the State of Colorado under the terms of the Upper Colorado River Basin compact (Stat.) for the release of waters originating in the Animas River in Colorado." [1]

Change 2, section 6

"(f) The Secretary of the Interior shall operate the project so that for the preservation of fish and aquatic life the flow of the Navajo River shall not be depleted below forty cubic feet per second of time, and the flow of the Blanco River below twenty cubic feet per second of time during any period of the year, at the points of diversion."

Change 3, section 8

Omit (d).

ATTACHMENT 9

LANGUAGE PROPOSED FEBRUARY 18, 1960, BY NEW MEXICO TO SUBSTITUTE FOR FIRST PROVISO OF SECTION 2 OF SANTA FE DRAFT (FEBRUARY 3, 1960) OF S. 72

"*Provided, however,* That the Secretary of the Interior shall operate the project and the Navajo Reservoir so as not to interfere with downstream uses in New Mexico existing or authorized prior to October 11, 1948, and shall make such releases from storage as are necessary to replace water losses to such uses to the extent that such losses are caused by the operation of Navajo Reservoir."

ATTACHMENT 10

NEW MEXICO PROPOSAL, MARCH 14, 1960

This language to be inserted in S. 72 Santa Fe draft (February 3, 1960) before last paragraph of section 7a in substitution for first proviso of section 2:

"Such contracts for the release of water from Navajo Reservoir to meet downstream requirements in the State of New Mexico which may otherwise constitute

[1] Substitutes for all italicized language of section 2 of redraft.

demands or obligations against users from the Animas River above its mouth under the terms of the Upper Colorado River Basin compact for the release of waters originating in the Animas River shall provide that such releases from Navajo Reservoir shall be regulated, insofar as possible, in any year in which the Secretary anticipates a shortage, so that the anticipated water supply available to such users from all sources bears the same proportion to the normal diversion requirements of these users as the water supply available under other contracts made hereunder bears to the normal diversion requirements under those contracts."

ATTACHMENT 11

PRESENTED TO NEW MEXICO ON APRIL 5, 1960, BY COLORADO WATER CONSERVATION BOARD

That S. 72 as revised at the Colorado-New Mexico conference at Santa Fe, N. Mex., February 2–3, 1960, be amended as follows:

Section 2: "*Provided, however,* That the Secretary of the Interior shall so operate the project and Navajo Reservoir that the waters of the San Juan River and its tributaries entering Navajo Reservoir shall be utilized to the full extent of their availability to satisfy downstream water uses in the State of New Mexico which are senior under the laws of the State of New Mexico to the Navajo Reservoir storage and diversion rights, and shall make such releases from storage as are necessary to supply the water requirements of Indian rights in the State of New Mexico diverting water from the San Juan River below Navajo Dam, when, in the opinion of the Secretary, such water requirements would otherwise constitute a lawful demand against the State of Colorado for the release of water originating on the Animas River in Colorado: *Provided further,* That nothing in this Act or section contained shall be construed as decreasing the quantity of water to which the State of New Mexico is entitled under the provisions of the Upper Colorado River Basin compact (63 Stat. 31)."

ATTACHMENT 12

COLORADO WATER CONSERVATION BOARD,
Denver, Colo., May 2, 1960.

MEMORANDUM

To members of the Colorado Water Conservation Board, Colorado Water Investigation Commission, and Colorado Congressional Delegation.

Subject: San Juan-Chama and Navajo irrigation projects legislation.

On Friday, April 29, 1960, I met in Santa Fe, N. Mex., with Mr. Steve Reynolds, New Mexico State engineer, and members of his staff, to determine whether or not any agreement could be reached on the Colorado amendments to the San Juan-Chama and Navajo irrigation projects authorizing legislation.

As a result of that meeting I have this date proposed the following to the State of New Mexico, which will be considered by the New Mexico Interstate Streams Commission at a meeting called for May 6, 1960, to wit:

S. 72 as revised at the Colorado-New Mexico Conference at Santa Fe, N. Mex., February 2–3, 1960, be amended as follows:

"SEC. 2. Provided that—

"(a) The Secretary of the Interior shall so operate the project and Navajo Reservoir that the waters of the San Juan River and its tributaries entering or stored in Navajo Reservoir shall be first utilized to the full extent of their availability to satisfy downstream requirements in the State of New Mexico, which requirements may otherwise constitute demands or obligations against the State of Colorado, under the terms of the Upper Colorado River Basin compact (63 Stat. 31), for the release of waters originating in the Animas River or its tributaries in Colorida: *And provided further,* That such utilization of San Juan River water shall be regulated, insofar as possible, so that shortages to users from Navajo Reservoir shall not exceed shortages to users from the Animas River in Colorado, including users from the proposed Animas-La Plata project, Colorado-New Mexico. The term 'shortages' as used in this section shall not include any shortages created by uses in the State of New Mexico in excess of New Mexico's allocation under the Upper Colorado River Basin compact;

"(b) The Secretary of the Interior shall make such releases from storage in Navajo Reservoir as are necessary to supply the water requirements of Indian rights in the State of New Mexico diverting water from the San Juan River below Navajo Dam, when such water requirements might otherwise constitute a lawful demand against the State of Colorado for the release of waters stored in Colorado;

"(c) Nothing in this section or Act contained shall be construed as increasing or decreasing the quantity of water to which the State of New Mexico may be entitled from the Animas River, or any other source, under the terms of the Upper Colorado River Basin compact, nor construed as interfering with the distribution of waters in the State of New Mexico pursuant to the laws of that State.

* * * * * * *

"SEC. 6. (f) The Secretary of the Interior shall operate the project so that for the preservation of fish and aquatic life the flow of the Navajo River and the flow of the Blanco River shall not be depleted at the project diversion points below the values set forth at page D 2-7 of appendix D of the United States Bureau of Reclamation report entitled 'San Juan-Chama Project, Colorado-New Mexico', dated November 1955."

Omit Section 7(*d*).

FELIX L. SPARKS, *Director.*

ATTACHMENT 13

NEW MEXICO INTERSTATE STREAM COMMISSION,
Santa Fe, N. Mex., May 6, 1960.

Mr. FELIX SPARKS,
Director, Colorado Water Conservation Board,
Denver, Colo.

DEAR MR. SPARKS: We have received a copy of your memorandum dated May 2, 1960, setting forth certain proposed amendments to S. 72.

Your proposal has been reviewed by the New Mexico Interstate Stream Commission and its advisers. We are of the impression as a result of this review that the basic principles of this amendment are not inconsistent with those contemplated by our March 14 proposal to you. For your ready reference, a copy of our proposal of that date is attached hereto. If this impression is correct, then, except for paragraph (b), we agree in principle to your proposed amendment with the reservation that the language shall be subject to editorial change.

With reference to paragraph (b), we propose the following language:

"The Secretary of the Interior shall operate Navajo Reservoir so that all releases from storage in or bypasses at Navajo Reservoir as are necessary to supply the water requirements of Indian rights in New Mexico diverting water from the San Juan River below Navajo Dam shall be chargeable to New Mexico's apportionment under the terms of article VII of the Upper Colorado River Basin compact."

Yours truly,

S. E. REYNOLDS, *Secretary.*

ATTACHMENT 14

COLORADO WATER CONSERVATION BOARD,
Denver, Colo., May 11, 1960.

It is proposed by the Colorado Water Conservation Board that S. 72 and H.R. 2352, 1st session, 86th Congress, be amended as follows (all amendments are show in italic letters):

"A BILL

"To authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, 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 purposes of furnishing water for irrigation [or] *of* irrigable and arable lands, municipal, domestic and industrial uses, (and for other beneficial purposes), providing recreation and fish and

wildlife benefits, controlling silt, the Congress hereby approves as participating projects of the Colorado River storage project the Navajo Indian irrigation project, New Mexico, and the *initial stage of the* San Juan-Chama project, Colorado-New [Mexico.] *Mexico, as conditioned, modified, and limited herein.* Principal engineering works of the Navajo Indian irrigation project shall be a main gravity canal, tunnels, siphons, pumps, and powerplants for project purposes, laterals, drains, distribution systems and related works. The *initial stage of the* San Juan-Chama project facilities shall be comprised principally of regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works.

"The Navajo Indian irrigation project and the *initial stage of the* San Juan-Chama project herein approved are substantially those described in the proposed coordinated report of the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, approved and adopted by the Secretary of Interior on October 16, 1957[.], *as conditioned, modified, and limited herein.*

"SEC. 2. Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain the Navajo Indian irrigation project for the principal purpose of furnishing irrigation water to [approximately] *not to exceed* one hundred and ten thousand six hundred and thirty acres of land, [said project to have an average annual diversion of five hundred and eight thousand acre-feet of water,] the repayment of the costs of construction thereof to be in accordance with the provisions of said Act of April 11, 1956 (70 Stat. 105), including, but not limited to, section 4(d) thereof: *Provided that—*

"*(a) The Secretary of the Interior shall so operate the project and Navajo Reservoir that the waters of the San Juan River and its tributaries entering or stored in Navajo Reservoir shall be first utilized to the full extent of their availability to satisfy downstream requirements in the State of New Mexico, which requirements may otherwise constitute demands or obligations against the State of Colorado, under the terms of the Upper Colorado River Basin compact (63 Stat. 31), for the release of waters originating in the Animas River or its tributaries in Colorado: And provided further, That such utilization of San Juan River water shall be regulated, insofar as possible, so that shortages to users from Navajo Reservoir shall not exceed shortages to users from the Animas River in Colorado, including users from the proposed Animas-La Plata project, Colorado-New Mexico. The term 'shortages' as used in this section shall not include any shortages created by uses in the State of New Mexico in excess of New Mexico's allocation under the Upper Colorado River Basin compact;*

"*(b) The Secretary of the Interior shall operate Navajo Reservoir so that all releases from storage in or bypasses at Navajo Reservoir as are necessary to supply the water requirements of Indian rights in New Mexico diverting water from the San Juan River below Navajo Dam shall be chargeable to New Mexico's apportionmnet under the terms of article VII of the Upper Colorado River Basin compact.*

"*(c) Nothing in this section or Act contained shall be construed as increasing or decreasing the quantity of water to which the State of New Mexico may be entitled from the Animas River, or any other source, under the terms of the Upper Colorado River Basin compact, nor construed as interfering with the distribution of waters in the State of New Mexico pursuant to the laws of that State.*

"SEC. 3. (a) In order to provide for the most economical development of the Navajo irrigation project, the Secretary of the Interior is hereby authorized and directed to declare by publication in the Federal Register that the United States of America holds in trust for the Navajo Tribe of Indians any legal subdivisions or unsurveyed tracts of federally owned land outside the present boundary of the Navajo Indian Reservation in New Mexico in townships 28 and 29 north, ranges 10 and 11 west, and townships 27 and 28 north, ranges 12 and 13 west, New Mexico principal meridian, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project: *Provided, however,* That no such legal subdivision or unsurveyed tract shall be so declared to be held in trust by the United States for the Navajo Tribe until the Navajo Tribe shall have paid the United States the full appraised value thereof: *And provided further,* That in making appraisals of such lands the Secretary of the Interior shall consider their values as of the date of approval of this Act, excluding therefrom the value of minerals subject to leasing under the Act of February 25, 1920, as amended (30 U.S.C. 181–286), and such leasable minerals shall not be held in trust for the Navajo

Tribe and shall continue to be subject to leasing under the Act of February 25, 1920, as amended, after the lands containing them have been declared to be held in trust by the United States for the Navajo Tribe.

"(b) The Navajo Tribe is hereby authorized to convey to the United States, and the Secretary of the Interior is hereby directed to accept on behalf of the United States, title to any land or interest in land within the above-described townships, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, acquired in fee simple by the Navajo Tribe, and after such conveyance said land or interest in land shall be held in trust by the United States for the Navajo Tribe as part of the Navajo Indian irrigation project.

(c) The Secretary of the Interior is hereby authorized and directed to acquire by purchase, exchange, or condemnation any other land or interest in land within the townships above described susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project. After such acquisition, said lands or interest in lands shall be held by the United States in trust for the Navajo Tribe of Indians and the price of such lands or interest in lands or of the land given in exchange therefor by the United States shall be charged to funds of the Navajo Tribe of Indians on deposit in the Treasury of the United States.

"SEC. 4. In developing the Navajo Indian irrigation project, the Secretary is authorized to provide capacity for municipal and industrial water supplies or miscellaneous purposes over and above the diversion requirements for irrigation stated in section 2 of this Act. But such additional capacity shall not be constructed and no appropriation of funds for such construction shall be made unless, prior thereto, contracts have been executed which, in the judgment of the Secretary, provide satisfactory assurance of repayment of all costs properly allocated to the purposes aforesaid with interest as provided by law.

"SEC. 5. Payment of operation and maintenance charges of the irrigation features of the Navajo Indian irrigation project shall be in accordance with the provisions of the Act of August 1, 1914 (38 Stat. 582, 583), as amended by the Act of August 7, 1946 (60 Stat. 867): *Provided*, That the Secretary of the Interior in his discretion may transfer to the Navajo Tribe of Indians the care, operation, and maintenance of all or any part of the Navajo Indian irrigation project works, subject to such rules and regulations as he may prescribe, and, in such event, the Secretary may transfer to the Navajo Tribe title to movable property necessary to the operation and maintenance of project works.

"SEC. 6. [(a)] Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain [an] *the* initial stage of the San Juan-Chama project, Colorado-New Mexico, for the principal purposes of furnishing water supplies to approximately thirty-nine thousand three hundred acres of land in Cerro, Taos, Llano, and Pojoaque tributary irrigation units in the Rio Grande Basin, about eighty-one thousand six hundred acres of land in the existing Middle Rio Grande Conservancy District, and municipal, domestic, and industrial uses, and providing recreation and fish and wildlife [benefits, said initial stage to have an average annual diversion of one hundred and ten thousand acre-feet of water.] *benefits. Said construction and operation of the diversion facilities of the initial stage authorized herein shall include only natural flow of the Navajo, Little Navajo, and Blanco Rivers in Colorado as set forth in the supplemental project report dated May 1957.* Principal engineering works of the initial stage development involving three major elements, shall include diversion dams and conduits, storage and regulation facilities at the Heron Numbered 4 Reservoir site and enlargement of outlet works of the existing El Vado Dam, and water use facilities consisting of reservoirs, dams, canals, lateral and drainage systems, and associated works and appurtenances. The construction of recreation facilities at the Nambe Reservoir shall be contingent upon the Secretary's making appropriate arrangements with the governing body of the Nambe Pueblo for the operation and maintenance of such facilities, and the construction of recreation facilities at the Heron Numbered 4, Valdez, and Indian Camp Reservoirs and shall be contingent upon the Secretary's making appropriate arrangements with a State or local agency or organization for the operation and maintenance of those facilities: *Provided*, That—

"*(a) The Secretary of the Interior shall so operate the initial stage of the project authorized herein that diversions to the Rio Grande Valley shall not exceed one million three hundred fifty thousand acre-feet of water in any period of ten consecutive years, reckoned in continuing progressive series starting with the first day of October after the project shall have commenced operation.*

"(*b*) *The Secretary of the Interior shall operate the project so that there shall be no injury, impairment, or depletion of existing or future beneficial uses of water within the State of Colorado the use of which is within the apportionment made to the State of Colorado by article III of the Upper Colorado River Basin compact, as provided by article IX of the Upper Colorado River Basin compact and article IX of the Rio Grande compact.*

"[(i)] (*c*) All works of the project [, both in its initial stage and in its final development,] shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact;

"[(ii)] (*d*) The amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year;

"[iii] (*e*) Details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided*, That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this subsection shall be incorporated in a written report transmitted to the States of Colorado, Texas, and New Mexico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction[.]*:*

"(*f*) *The Secretary of the Interior shall operate the project so that for the preservation of fish and aquatic life the flow of the Navajo River and the flow of the Blanco River shall not be depleted at the project diversion points below the values set forth at page D2–7 of appendix D of the United States Bureau of Reclamation report entitled "San Juan-Chama Project, Colorado-New Mexico", Dated November 1955.*

"[(b)] (*g*) The Secretary of the Interior is hereby authorized to construct the tunnel and conduit works of the initial stage of the San Juan-Chama project with sufficient capacity for future diversion of an average of two hundred and thirty-five thousand acre-feet per annum, and to recognize the cost of providing such additional capacity as a deferred obligation to be paid at such time as the additional capacity may be required[.]*: Provided, however, That nothing contained in this Act shall be construed as committing the Congress of the United States to future authorization of any additional stage of the San Juan-Chama project.*

"SEC. 7. (a) No person shall have or be entitled to have the use for any purpose, including uses under the Navajo Indian irrigation project and [the initial stage of] the San Juan-Chama project authorized by sections 2 and 6 [(a)] of this Act, of water stored in Navajo Reservoir or of any other waters of the San Juan River and its tributaries originating above Navajo Reservoir to the use of which the United States is [entitled] *entitled, under these projects,* except under contract satisfactory to the Secretary of the Interior and conforming to the provisions of this Act. Such contracts, which, in the case of water for Indian uses, shall be executed with the Navajo Tribe, shall make provisions, in any year in which the Secretary anticipates a shortage taking into account both prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for a sharing of the available water in the following manner: The prospective runoff shall be apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each group bears to the total of all normal diversion requirements. In the case of contractors diverting above Navajo Reservoir, each such contract shall provide for a sharing of the runoff apportioned to said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts that have been made hereunder: *Provided*, That for any year in

which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of his diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to said group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the proportion that the normal diversion requirements of each bears to the total normal diversion requirements of the group. In the case of contractors diverting from or below Navajo Reservoir, each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts that have been made hereunder.

"The Secretary shall not enter into contracts beyond a total amount of water that, in his judgment, in the event of shortage will result in a reasonable amount being available for the diversion requirements for the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as specified in sections 2 and 6 [(a)] of this Act.

"(b) In the event contracts are entered into for delivery from storage in Navajo Reservoir of water not covered by subsection (a) of this section, such contracts shall be subject to the same provision for sharing of available water supply in the event of shortage as in the case of contracts required to be made pursuant to subparagraph (a) of this section.

"(c) This section shall not be applicable to the water requirements of the existing Fruitland, Hogback, Cudai, and Cambridge Indian irrigation projects, nor to the water required in connection with the extension of the irrigated acreages of the Fruitland and Hogback Indian irrigation projects in a total amount of approximately eleven thousand acres.

"*Sec. 8. (a) None of the project works, or structures authorized by this Act shall be operated by the Secretary of the Interior so as to create, implement or satisfy any preferential right in the United States or any Indian tribe to the waters impounded, diverted or used by means of such project works or structures, other than contained in those rights to the uses of water granted to the States of New Mexico or Arizona pursuant to the provisions of the Upper Colorado River Basin compact.*

"*(b) The Secretary of the Interior shall operate the projects authorized by this Act so that no waters shall be diverted or used by means of the project works, which, together with all other waters used in or diverted from the San Juan River Basin in New Mexico, will exceed the water available to the States of New Mexico and Arizona under the allocation contained in article III of the Upper Colorado River Basin compact for any water year.*

"[SEC. 8.] *SEC. 9.* Section 12 of the Act of April 11, 1956, 70 Stat. 105, shall not apply to the works authorized by this Act. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such funds as may be required to carry out the purposes of this Act, but not to exceed $221,000,000 (January 1958 prices) plus such amounts, if any, as may be required by reason of changes in construction costs as indicated by engineering cost indexes applicable to the types of construction involved therein and, in addition thereto, such sums as may be required to operate and maintain the projects.

"[SEC. 9.] *SEC. 10.* The Act of April 11, 1956 (70 Stat. 105), is hereby amended as follows: (1) In section 1, subsection (2), after 'Central Utah (initial phase)', delete the colon and insert in lieu thereof a comma; (ii) in section 5, subsection (e), in the phrase 'herein or hereinafter authorized', delete the word 'hereinafter' and insert in lieu thereof the word 'hereafter'; (iii) in section 7, in the phrase 'and any contract lawfully entered unto under said compacts and Acts', delete the word 'unto' and insert in lieu thereof the word 'into'."

Mr. ROGERS. You may proceed, Mr. Reynolds.

Mr. REYNOLDS. The official comments of the State of Texas on the San Juan-Chama project suggested certain provisions in the authorizing legislation which would guarantee compliance with the Rio Grande compact, provide for accurate and careful measurement of the important waters, the administration of those waters to insure that the rights of Texas were fully protected.

On the occasion of the hearings on S. 3648 before the Senate the provisions the State of Texas had suggested were carefully discussed

by representatives of the States of Texas and New Mexico and agreement in principle on the provision was reached.

By letter dated July 21, 1958, Governor Mechem forwarded to the Governor of New Mexico letters to provide Texas the assurances sought.

A copy of that letter is filed with this statement. The language of those amendments are included in H.R. 2352 and H.R. 2494.

The comments of the Elephant Butte Irrigation District in New Mexico generally parallel those of the State of Texas, and the objections raised there would also be met, we believe, by the provisions of those subparagraphs.

The comments of the State of California attempted to make an economic analysis of these two projects under what we believe to be specious criteria, using interest rates higher than the Bureau of Reclamation figures, duplicating charges for storage capacity, and other defective criteria, we think.

Mr. ASPINALL. You mean to say that the State of California has used an interest rate higher than that provided for in the Upper Colorado River authorizing legislation?

Mr. REYNOLDS. The Bureau of Reclamation, in making their economic analysis of the benefits and costs, normally use two and a half percent interest rate.

Mr. ASPINALL. I understand that. Under the procedure under which we are necessarily proceeding as of this time we use the interest formula that is in the Upper Colorado River Project Act.

Mr. REYNOLDS. It is my understanding that in considering repayment provisions for power for municipal and industrial uses then the interest rate formula set up in Public Law 485 controls, but it is also my understanding that in making their economic analysis, determining benefits and costs of an irrigation project, the Bureau of Reclamation uses a two and a half percent interest rate and that is the rate to which I have referred. I have not referred——

Mr. ASPINALL. If they use one and the Bureau of the Budget uses the other it creates a problem.

Mr. REYNOLDS. Yes, sir.

At any rate, we should liketo point out that the Bureau of Reclamation has analyzed these projects in accordance with criteria adopted and accepted by the Department of the Interior and by the Congress for the evaluation of water projects, and under these criteria they have found both projects to be economically feasible.

In connection with hearings on S. 3648 before the Senate subcommittee, Senator Kuchel, in behalf of the Colorado River Board of California, submitted a series of proposed amendments. These proposed amendments parallel to a large extent amendments that were proposed in the official comments of the State of California, and the State of New Mexico's position on these proposed amendments was submitted to Senator Anderson by letter from the Governor of the State of New Mexico on July 21, 1958. A copy of the Governor's letter of that date is filed with the statement for the information of this committee.

As a result of our negotiations with the State of Colorado, our position on some of those proposed amendments has been changed. The first amendment proposed by the State of California would delete from section 1 of H.R. 2352 congressional approval of the ultimate San

Juan-Chama project for the diversion of an average of 235,000 acre-feet per year.

The stated purpose is to make it plain that only the initial stage of the project is approved and that only that stage is intended to be authorized.

New Mexico now agrees to such a proposed amendment provided that the language of 6(b), which authorizes the Secretary of the Interior to construct the tunnel and conduit works of the initial stage of the project with sufficient capacity for the future ultimate diversion of 235,000 acre-feet per year, is retained.

The second amendment proposed by California would have limited the initial stage of the San Juan-Chama project to an average diversion of 1,100,000 acre-feet in any period of 10 consecutive years, and would have added a proviso that nothing in the act shall constitute a commitment, real or implied, to the further exportation of water from the Colorado River system.

New Mexico still finds such an amendment unacceptable. However, in our negotiations with the State of Colorado we have agreed to a provision which would limit the initial stage project to a diversion of 1,350,000 acre-feet in any period of 10 consecutive years and have agreed to a proviso that nothing contained in the act shall be construed as committing the Congress of the United States to future authorization of any additional stage of the San Juan-Chama project.

Our position on all the other amendments proposed by California remains the same as set forth in the Governor's letter of July 21, 1958.

The official comments of the State of Colorado noted that the construction of the San Juan-Chama-Navajo projects along with other potential projects in the development of prospective uses of water in the San Juan Basin would be of great benefit to the area served. Those comments make no objections to the projects that would be authorized by H.R. 2352.

However, the Colorado comments also noted apparent differences of opinion existing in respect to the projects and pointed out that the Governors of the States of New Mexico and Colorado—

are following established procedures to determine the facts involved in an attempt to resolve any differences found to exist.

These negotiations were formally initiated after a letter from Governor McNichols on February 12 of 1958. Negotiations were undertaken on an intensive basis on February 2 of 1960.

The attachments submitted with this statement set forth the record of each step in these negotiations.

The attachments also will include as attachment 15 a draft of legislation which was agreed to after a meeting of representatives of the two States last night. That draft will be the same as attachment 14 which is submitted herewith except that the provisions of section 2 as set forth in attachment 14 hereto will now read identically with the provisions of section 2 of H.R. 2352.

New Mexico, of course, is fully satisfied with the provisions of H.R. 2352 and H.R. 2494 as introduced by Congressman Morris and Congressman Montoya. However, Mr. Mann and I are authorized to advise the committee that the State of New Mexico agrees in principle to the provisions of the amended draft, which will be submitted as attachment 15 as soon as we have been able to reproduce it.

We believe that the record of the negotiations between New Mexico and Colorado which we have outlined here demonstrate a diligent effort in good faith on the part of both States to resolve a very complex and very difficult problem. We have burdened the record perhaps unduly, but we did wish to show the great amount of time and effort that both States have expended to resolve our differences.

The State of New Mexico is most grateful to the State of Colorado for its part in bringing about this agreement.

I should like to supplement my statement with one further comment, if I may.

I note that the report of the Bureau of the Budget expresses some concern about the fact that a large amount of water would be committed to agricultural purposes under the proposed Navajo project, and that perhaps this water should be saved for potential industrial development on the west side.

I should like to point out, first, that the Indians, the Utah Construction Co. under contracts, are proposing the development of power. The Utah Construction Co. has filed under State law for 55,000 acre-feet of water for purposes of power production. This would result in a depletion of about 39,000 acre-feet per year.

The reservation of water for Utah Construction Co. is in addition to a proposed tentative amount of up to 224,000 acre-feet per year which may be drawn from Navajo Reservoir under contract with the Secretary for municipal and industrial purposes on the west side. That would amount to a depletion of about 112,000 acre-feet per year.

That amount of water is sufficient to take care of the needs of over 1 million people in an economy, for example, of the nature of that which exists in the Albuquerque area at this time.

The number of over 1 million people compares to a present population in the San Juan Basin in New Mexico of less than 70,000 people.

I think, also, that the history of reclamation projects such as those in the Phoenix area, the El Paso area, the Albuquerque area, demonstrates that reclamation provides the base for future large municipal and industrial economy.

In conclusion, Mr. Mann and I would urge the committee's early favorable action on this legislation which would authorize the projects of vital importance to the State of New Mexico, and we are most grateful for this opportunity to appear before you in support of these projects.

Mr. ROGERS. Thank you, Mr. Reynolds, for your statement and for your comments thereon.

The Chair recognizes the gentleman from Colorado, Mr. Aspinall.

Mr. ASPINALL. Mr. Reynolds, it is good to have you give to us this complete statement.

I notice in the allocations set forth by the Department, as well as by the Bureau of the Budget, they have an allocation of $3 million for future use. What is that use for?

Mr. REYNOLDS. Mr. Aspinall, it would cost approximately $3 million to build into the initial stage of the San Juan-Chama project a tunnel and conduit capacity sufficient to take care of the ultimate diversion of 235,000 acre-feet per annum.

That $3 million, then, would be charged against future uses, if they develop.

Mr. ASPINALL. Would that be a reimbursable item?

Mr. REYNOLDS. As I understand it, it would be reimbursable. Certainly if those future uses were municipal and industrial uses, or irrigation uses that had ability to repay, that would be so.

Mr. ASPINALL. I did not ask it that way. I wanted to know if they would be reimbursable under the present proposal.

Mr. REYNOLDS. It is my understanding that if the future uses do not develop, then that $3 million would be repaid with New Mexico's share of the power of new credits.

Mr. ASPINALL. With interest or without interest?

Mr. REYNOLDS. I am not sure, sir, whether the Bureau has figured that with or without interest. I presume it is without interest, but I am not able to answer.

Mr. ASPINALL. In other words, there is no definite understanding at the present time as to whether it is to be chargeable to irrigation, which your last suggestion would be, or whether it is to be charged to municipal and industrial water, which would bear interest, or whether it is to be divided part to municipal and industrial water and part to irrigation?

Mr. REYNOLDS. So far as I know, the Bureau has not made a decision as to whether that would be allocated against municipal and industrial uses or irrigation uses for repayment purposes.

Mr. ASPINALL. Now, to get back to this rather ticklish matter of interest, what happens to this project if we are unable to change the interest called for in the upper Colorado legislation?

Mr. REYNOLDS. This would considerably increase the costs payable by the city of Albuquerque.

Mr. ASPINALL. Is there any particular provision in the present legislation that would change the rate of interest other than that provided for in the upper Colorado River storage and development legislation, Public Law 485?

Mr. REYNOLDS. I think there is no such provision in this legislation.

Mr. ASPINALL. That is all.

Mr. ROGERS. Mr. Haley?

Mr. HALEY. I have just one question. We have an engineer here and it may sound like a foolish question, but I would like to know what is the elevation where the transmountain diversion enters the picture?

Mr. REYNOLDS. Mr. Charles testified this morning, as I remember, sir, that the elevation at the point where the San Juan-Chama project crosses the Continental Divide is in the neighborhood of 8,000 feet above sea level.

Mr. HALEY. That is correct, then. He said he thought it was.

Mr. REYNOLDS. I am relying on his testimony. I am sorry that I am not prepared to give you a specific figure on that, sir.

Mr. ROGERS. Mr. Saund?

Mr. SAUND. Thank you, Mr. Chairman.

I understand these dealings are of an exploratory nature. Can the chairman tell me what "exploratory" means?

Mr. ROGERS. That means we will get the record and move as fast as we can, but it is doubtful we will be able to do it this year.

Mr. SAUND. Here we have had two important witnesses. These are the longest statements that I have seen. You do not expect us to question on these at the present time, do you?

Mr. ROGERS. I thought, Mr. Saund, there might be some questions in your mind about the matter in general.

Mr. SAUND. This is serious, Mr. Chairman. Would I have the opportunity as a member of this subcommittee to ask questions from these witnesses on their statements at a later date when we have had an opportunity to read them, or are these exploratory hearings?

Mr. ROGERS. Let me make this perfectly clear: One reason we are getting the record worked out at the present time is so that the members will have a chance to have a complete record on this matter. Then when it does come up at the proper time for action they will be thoroughly familiar with it.

If such problems may be presented so as to require additional hearings, I think it would be a matter for the committee to have to decide whether or not witnesses are to be called back.

Mr. SAUND. All I wish to say for the record is this: I would like to have the opportunity to question these witnesses later after I have had a chance to really study the statements.

I don't know what the witness meant about the amendments offered by the State of California, and I am not fully familiar with these amendments, because this is exploratory and I did not make a real effort to become fully acquainted with these statements. I am not sure of this.

Mr. ROGERS. Let me make this observation: The gentleman from California will certainly be entitled to have the right to request that the committee call witnesses back. What the action of the committee would be on his request is something the Chair could not tell at the present time.

Mr. SAUND. I just made the request.

Mr. ROGERS. He is entitled to make an argument in behalf of his request.

Mr. SAUND. I am just making the request to quiz the present witnesses on this important project. I would like to do that after I have had an opportunity to go over these statements.

Mr. ROGERS. When there is a quorum present, that request should be acted upon. There being no quorum at this present time, I do not think it would be proper.

Mr. SAUND. You are always very fair, and I have followed your leadership on everything.

Mr. ROGERS. I feel sure that the gentleman from California will be furnished ample opportunity to make inquiries, and if possible he will have ample opportunity to reexamine the witness.

Do you have questions at this time?

Mr. SAUND. No, sir.

Mr. ROGERS. Mr. Morris?

Mr. MORRIS. I would like to commend Mr. Reynolds and Mr. Mann on their statements. I would like to ask one or two questions in addition.

My first question to you, Mr. Reynolds, is this: You are an engineer?

Mr. REYNOLDS. Yes, sir.

Mr. MORRIS. You are a qualified engineer. You heard the questions of the gentleman from California who was present this morning during the committee hearings, and you heard the questions of the gentleman from California, Mr. Hosmer. Mr. Hosmer asked Mr. Palmer some questions that had to do with the quality of water.

In your opinion as an engineer, what effect would the San Juan-Chama transmountain diversion project have on the quality of water in the lower Colorado River Basin—and I am specifically referring to California at this time? What effect would it have on the quality of water there in comparison with other uses which might be made of this water in the San Juan River Basin?

Mr. REYNOLDS. May I make perhaps just a few comments about the provisions of the Colorado River compact. As the committee knows, I am sure, it allocated in perpetuity to the upper basin and to the lower basin, respectively, the exclusive beneficial consumptive use of 7½ million acre-feet of water per year. The compact also stated that present perfected rights to the beneficial uses of the waters of the Colorado River system are unimpaired by the compact. The latter would seem to be a simple declaration of fact.

I think it is self-evident and certainly those who signed the compact must have known that the consumptive use of 7½ million acre-feet of water per year above Lee Ferry will inevitably change both the quantity and quality of the remaining flow of the lower basin.

Aside from this, the assumed detriment to lower basin users by reason of transmountain diversions of good quality water is a misconception which I think should be laid to rest. Successful irrigation requires that the dissolved solids in the water be flushed out by drainage and return flows to the stream. Otherwise, the salts would accumulate in the soils and the growing of crops would soon be impossible.

Thus, in irrigation the water is consumed while the dissolved solids are retained in the residual streamflows.

Since transmountain diversions remove both the salt and the water from the basin, the remaining supply is actually of better quality than would result from the consumptive use of the same amount of water within the basin. Certainly the upper basin States have the right to consume this water.

I think, then, California's concern and attention to the effects of transmountain diversions on the quality of the water to the lower basin are not justified.

Mr. MORRIS. I yield to my distinguished colleague from California, Mr. Saund.

Mr. SAUND. You have expressed your opinion of that. I happen to differ from you. I remember that in 1957 a subcommittee of this committee went to my district and the then chairman of the committee, Mr. Engle, made the statement that the people of southern California are entitled to the quantity of water which they could use, clearly referring to the quality of water. I think quality of water is very important. In fact, today there is pending before this committee my resolution requesting the Secretary of the Interior to carry out that provision of the Upper Colorado River Basin Project Act to study the salinity content of the water of the Colorado River.

Do you mean to tell me that when you are downstream, at the lower end of a river or a ditch, if somebody diverts water in the upper reaches away from that stream it does not affect the quality of that water at all?

Mr. REYNOLDS. No, sir. I want to be perfectly clear about that. I have not said the consumptive use of water in the upper basin will not affect the quality of the flows to the lower basin. Certainly the con-

sumptive use of water in the upper basin will reduce the quality in in the lower basin. I have simply said that the transmountain diversion of a certain amount of water will have a less effect on the quality than the consumptive use of an equal amount within the basin. That is, so far as problems of quality of water are concerned, the State of California should encourage transmountain diversions rather than consumptive uses within the basin.

Mr. SAUND. Thank you for your remarks. That is all I can say. If they take water from the upper reaches of the upper Colorado River, they are taking good water away.

Mr. REYNOLDS. Sir, I would like to point out the water consumed in an irrigation project is in effect distilled and absolutely pure water, and the flows which go back carry all the dissolved solids.

Mr. SAUND. I am a friend of Mr. Morris, and I am a friend of reclamation all the way through. As the chairman said, we will have the opportunity to ask you questions when I have studied your statement later on, and we shall not take time to go into this now. As I understand, we are not reporting this bill out this year.

Mr. MORRIS. I do not know whether we understand that or not.

Mr. ROGERS. Mr. Morris, you may proceed.

Mr. MORRIS. Mr. Reynolds, you are an engineer. You are also familiar with and understand the method of calculation that the Bureau of Reclamation uses and that the Bureau of the Budget uses, the benefit-cost ratio.

Mr. REYNOLDS. Yes, sir.

Mr. MORRIS. Would you compare the benefit-cost ratio on a 50-year basis, the direct benefits only, of this project which we have before the committee, with other authorized projects of the upper Colorado River storage project?

Mr. REYNOLDS. Yes, sir. I am able to do that from a review of the Secretary of the Interior's financial and economic analysis of the storage project as of December of 1958. According to that analysis, 7 of the 77 presently authorized units of the storage project, analyzed on a 50-year basis, considering direct benefits only, show a benefit-cost ratio of 0.6 to 1. Only 1 of those 11 projects, the Paonia project in Colorado, shows a better benefit-cost ratio than the San Juan-Chama project, the Paonia project having a benefit-cost ratio of 0.9 to 1 as compared to the 0.8 to 1 benefit-cost ratio of the San Juan-Chama project.

Mr. MORRIS. You are saying, Mr. Reynolds, in effect, that of the 11 projects presently authorized under the Upper Colorado River Storage Act, the project presently before the committee is better than the average of those projects?

Mr. REYNOLDS. Yes, sir. As a matter of fact, it is better than any but one of those authorized projects.

Mr. MORRIS. Thank you.

Mr. ROGERS. Are there further questions?

(No response.)

Mr. ROGERS. Thank you very much, Mr. Reynolds, for your presentation.

The next witness is Mr. Edward J. Bieberich, of Gallup, N. Mex. Mr. Bieberich, will you come forward, please, sir.

Mr. BIEBERICH. Mr. Chairman and committee members, my name is Edward Bieberich, and I am chairman of the Water Resources Development Committee of the Town of Gallup, N. Mex.

I have with me Mayor Edward Munoz, of Gallup, and our engineering consultant, Mr. J. T. Banner. We have prepared several very short statements. One statement is accompanied by the statement that we originally made to the Senate. We would like to submit those to be part of the record.

Mr. ROGERS. Let the Chair make this observation. Without objection, the statement which was presented before the U.S. Senate hearings on S. 3648 will be accepted for the file rather than the record.

Mr. BIEBERICH. We would like Mayor Munoz to read his statement. I think you have a copy of that.

STATEMENT OF EDWARD MUNOZ, MAYOR, TOWN OF GALLUP, N. MEX.

Mr. ROGERS. You are Mr. Edward Munoz, mayor of the town of Gallup, N. Mex.?

Mayor MUNOZ. Yes, sir.

Mr. ROGERS. You may proceed, Mr. Mayor.

Mayor MUNOZ. Mr. Chairman and members of the committee, it is my pleasure to appear before your committee today in support of the bill under consideration, and in particular to support the Navajo Indian irrigation project and that portion of the bill authorizing the town of Gallup to obtain municipal water from the Navajo dam.

The town of Gallup is located at the intersection of U.S. Highway 66 with U.S. Highway 666 and the main line of the Santa Fe Railroad passes through our town. We have a large labor supply. We have just recently negotiated a power contract which would provide surplus power for the town of Gallup. We have wide open spaces and fair weather. We feel that our community is capable of and desires to expand and grow. The only missing element in our community for continued growth and development is water.

Various other people who will appear before you today will go into detail as to the quantity of water which we have, the needs that we have, and our plans for developing future water. Our long-range hope and dream is to obtain water from the Navajo Dam.

To do this it is first necessary that authorization and funds be provided by Congress to construct the Navajo irrigation project. In cooperation with the Navajo Tribe, we hope to utilize their irrigation system during slack periods in the irrigation program filling a reservoir at Newcomb, N. Mex. (Captain Tom's Reservoir) and then jointly participating with other users, including the Navajo Tribe, in bringing water to Gallup.

I want to add further that we have a new installation in the city of Gallup, U.S. Public Health Service Hospital, which has added to the requirements for additional water. The Federal personnel which is congregated in the area because of Federal activities will also be in need of this additional water which we are trying to acquire through contract with the Secretary of the Interior.

We are, therefore, very much in favor of the passage of the legislation now pending before your committee which would authorize the Navajo Indian irrigation project and which would authorize municipal water to be delivered for use in the town of Gallup.

Mr. ROGERS. Thank you, Mr. Mayor.

Have any of the committee members any questions of Mayor Munoz?

Mr. ASPINALL. Mr. Chairman, I have a question.

What part of the cost of the Navajo Dam does the town of Gallup expect to accept as their obligation in this desire that they have to secure municipal water from the Navajo Dam and Reservoir?

Mayor MUNOZ. I will refer that question to Mr. Banner, our consulting engineer, with your permission.

Mr. BANNER. I am J. T. Banner, of Laramie, Wyo. I have been consulting engineer for the town of Gallup with respect to their water supply for about 4 years.

With respect to that question, we in 1957 asked the Bureau of Reclamation and the Department of the Interior what the charges might be with respect to conveyance of water from Navajo Dam to the area around Newcomb through the proposed canal system as well as provision for storage in the Navajo Dam. As of now, there is no information yet available as to what the charges might be. However, it is the intention of the town of Gallup that they would pay for an equitable charge in that respect.

Mr. ASPINALL. It would be related, as I understand you, to the cost of the construction of the dam.

Mr. BANNER. That is correct.

Mr. ASPINALL. As well as to the cost of transportation of the water from the dam to the Newcomb Reservoir.

Mr. BANNER. That is correct.

Mr. ASPINALL. Which then would be, from that point on, at the expense of the town of Gallup.

Mr. BANNER. That is correct.

Mr. ASPINALL. Would the town of Gallup be seeking any Federal aid to construct their reservoir and the pipeline from the reservoir to the city mains?

Mr. BANNER. I do not know that I could answer that question at this time. The intent is that the cost of amortizing the debt necessary to construct the pipeline, treatment and pumping facilities, and storage, would be paid for by sale of water to the water users.

Mr. ASPINALL. It would be no part of the cost of the Navajo project?

Mr. BANNER. That is correct.

Mr. ASPINALL. Would the rentals which you would pay go to the treasury of the Navajo participating project, would they go to the Treasury of the Federal Government, or would they go to the upper basin fund?

Mr. BANNER. I do not know that I can answer that question. It has been our assumption that this would become a contract with the Bureau of Reclamation with respect to the Navajo Dam and storage requirements therein. They have had in the past, with other users, a similar type of contract.

Mr. ASPINALL. Have you heard anybody representing the Bureau of Reclamation state that they expect to make any contribution whatsoever out of that installation to the upper basin fund?

Mr. BANNER. We have no information on that.

Mr. ASPINALL. That is all.

Mr. ROGERS. Any other questions?

Mr. SAUND. I wish to express my welcome to the mayor of the city of Gallup.

Mayor MUNOZ. Thank you.

Mr. MORRIS. Mr. Chairman, I would like to welcome the mayor and the gentlemen who are appearing before the committee, and commend them on their fine statement.

May I say to my friend from California that we would not only like to have you visit Gallup, but we would like to have you visit all over New Mexico and spend some of that California money.

(Off the record.)

STATEMENT OF EDWARD J. BIEBERICH, CHAIRMAN, WATER RESOURCES DEVELOPMENT COMMITTEE, GALLUP, N. MEX.

Mr. ROGERS. Mr. Bieberich, do you have a statement you wish to make?

Mr. BIEBERICH. Yes; I have a statement which I would like to present at this time.

Mr. ROGERS. You may proceed.

Mr. BIEBERICH. A delegation representing the board of trustees and citizens of the town of Gallup, N. Mex., appeared at Senate committee hearings last year to urge approval of its bill authorizing the Navajo irrigation project, then designated S. 3648 and presently designated S. 72. At that time the delegation presented a prepared statement to that committee. We offer additional copies to this committee, since it contains in some volume the factors which bear upon our purpose in appearing before you today in support of H.R. 2352. We hope you will give it careful study.

Our support of the bill now pending before you is twofold. First, we are convinced that our entire region is rapidly reaching the limits of its growth unless additional sources of water are developed. We have reports of the U.S. Geological Survey, community planning consultants, Harland Bartholomew & Associates, and Engineering Consultants J. T. Banner & Associates. All of these conclude that regardless of all other factors which tend toward expansion and development of your community and our region, water is the limiting factor.

The Navajo project and the San Juan-Chama diversion represent perhaps the last hope of this vast region to obtain the water we must have if the many natural and human resources of the region are to make their fullest contribution to the society and economy of this Nation.

While we represent directly the town of Gallup, we readily recognize that the contribution of these projects to the expansion of the social and economic opportunities of the many thousands of Indian people in the region is far more significant than for the rest of us.

Our second consideration is basic to the first. Economic and social advancement of the entire region of the Indians and others throughout the project depends in large measure upon the growth and development of existing communities. It must keep pace with the entire region in providing the services essential to a dynamic economy.

Gallup is uniquely endowed to fulfill this purpose. It must both grow with the region and contribute to the regional growth. Water is the key to our growth as a community, just as it is to the growth of the entire region.

As you will see in studying our prepared statement, it is our desire and our intention that the town of Gallup be included in the project plans under the provision for municipal and industrial development.

We believe that the authors and supporters of this measure were wise to include in the bill the provision for municipal and industrial growth, knowing that only in this way can the greatest good be obtained from the use of this scarce and vital resource.

The town of Gallup desires and intends to take its place in this development. We believe that this desire and intent are fully in keeping with the basic principles of natural resource development underlying the purposes of this bill.

All of us here appreciate the opportunity to appear before this committee. You may be sure that this appreciation is shared by all those whom we represent. In appearing here we hope we are of assistance to you in reaching a decision in the matter of approving these projects, a matter we believe to be vital not only to us as a community or to the region, but to the entire Nation.

I thank you.

We also have with us Mr. Junker, who has a statement which he would like to put in the record.

Mr. ROGERS. Do you want to make that statement, Mr. Junker?

Mr. JUNKER. It is very short. I shall read it.

Mr. ROGERS. I notice Mr. Banner has a statement, too. Did you want to read that, Mr. Banner, or insert it in the record?

Mr. BANNER. Mr. Chairman, whatever you wish. If the time is short, I shall be glad just to summarize it.

Mr. ROGERS. Let Mr. Junker give us his statement, and then we will let you summarize that, and then we shall ask questions of all four. Mr. Junker.

STATEMENT OF EDWARD JUNKER, GALLUP, N. MEX.

Mr. JUNKER. Mr. Chairman and members of the committee, it is a pleasure to appear today before your committee in support of the bill under consideration, particularly in support of the Navajo irrigation project as well as the portion of the bill authorizing the town of Gallup to obtain municipal water from Navajo Dam.

In order that Gallup and the surrounding area may advance and grow, it is absolutely necessary that we have a guaranteed supply of water.

Large areas of land are available near Gallup for industrial development. There is also an unlimited labor supply and railroad facilities. Gallup is situated on U.S. 66, the main highway to the Pacific coast.

At the present time our water is supplied by deep wells which provide barely enough water to take care of our domestic needs.

I would like to emphasize that the only way we can expand and develop resources and industry in the immediate area is to have an assured and adequate supply of water.

Mr. ROGERS. Thank you, Mr. Junker.

Without objection, the statement of Mr. J. T. Banner, consulting engineer, of Laramie, Wyo., will be included in the record at this point.

(The statement referred to follows:)

STATEMENT OF J. T. BANNER, CONSULTING ENGINEER, LARAMIE, WYO.

I am J. T. Banner, consulting engineer of Laramie, Wyo. I have been retained by the town of Gallup during the last 4 years in connection with their municipal water supply.

At the present time Gallup obtains their water supply from two well fields, immediately adjacent to the town on the east and west. Although it is evident that there has been some overdraft in the past on the east well field, it is estimated that the safe long-time water yield that can be obtained from the town's two well fields is not less than 2½ million gallons per day, and may be as much as 3½ million gallons per day. The quality of the water obtained from the present sources of supply is generally satisfactory; however, the water from the east well field is considerably harder than is desirable for a satisfactory municipal water supply.

Gallup's present population is about 13,500. Estimated future Gallup populations are:

1960	13,500	1970	20,100
1965	16,100	1975	25,100

The present and future water needs of Gallup are:

	Gallons per day		*Gallons per day*
Present	2,200,000	1965	3,720,000
1960	2,400,000	1975	5,500,000

From comparison of the 3½ million gallons per day maximum that is available from the town's present well sources, with the town's future needs, it appears that the town will have to go to a new source of water supply sometime between 1965 and 1970.

Studies over the last 3 years indicate that the San Juan River is the most reliable permanent source of supply that is available to the town of Gallup. Although the San Juan River is some 100 miles from Gallup, water from the San Juan River will be delivered through the Navajo irrigation project to a point about 55 miles north of Gallup.

In addition to the town's needs, the Navajo Tribe is desirous of joining with the town of Gallup in a joint use facility at the time it is possible to proceed with this development.

The present and future water needs for the Navajo Tribe are tabulated below. Of particular significance is the ability to serve schools between Newcomb and Window Rock.

WATER NEEDS

Schools from Captain Tom Reservoir to Window Rock Junction

Year	Estimated school population	Estimated water needs (per capita per day)	Estimated total water needs (gallons per day)
1959	1,200	10	12,000
1980	1,800	20	36,000
2000	2,700	20	54,000

Window Rock and Fort Defiance area

Year	Estimated population	Estimated water needs (per capita per day)	Estimated total water needs (gallons per day)
1959	3,000	100	300,000
1980	4,800	125	600,000
2000	7,700	150	1,155,000

It is contemplated that storage capacity will be obtained in the Navajo Reservoir on the San Juan River. The water will be carried from this reservoir

through the Navajo irrigation project canal system to a storage reservoir in the Newcomb area. This storage reservoir would be constructed by the town. With the storage in the Newcomb area, the water could be carried through the project canal system without increasing the capacities over those required for irrigation needs.

Water would be delivered from the 8,800 acre-foot storage reservoir in the Newcomb area to both Gallup and the Window Rock-Fort Defiance areas through a system of pipelines with necessary pumping facilities. It is estimated that facilities would include about 50 miles of 20-inch pipeline, 8 miles of 18-inch pipeline, and 23 miles of 10-inch pipeline. The estimated cost of the combined facilities including pumping facilities, treatment plant, and storage is about $7 million.

This cost does not include the cost of storage capacity at Navajo Reservoir or any cost of conveyance through the Navajo project canal system. These facilities are to be paid for from revenues derived from the sale of water to the users. It is estimated that the cost of water to the users would be between $0.25 and $0.40 per thousand gallons, exclusive of the cost necessary to store and convey water from the Navajo Reservoir to the Newcomb area.

The fact that this proposed supply system is entirely dependent upon the construction of the Navajo Dam and the Navajo project; and that much of the industrial expansion in Gallup will provide employment for the Navajo people; strongly indicates that the Gallup supply system should be considered as a supplement to the Navajo project.

The town of Gallup has consistently maintained a position of reserving a minimum of 15,000 acre-feet as part of the 224,000 acre-feet proposed to be developed for municipal and industrial purposes in addition to the San Juan-Chama diversion and the Navajo project proper. The proposed uses by the Navajo Tribe would increase this total to about 20,000 acre-feet.

We, therefore, respectfully request that the requirements for the Navajo Tribe and the town of Gallup be included for diversion at the Navajo Dam through the Navajo project canal system; and that the delivery of the amount of water required be made to a point near Newcomb as a part of (or supplement to) the Navajo Dam and the Navajo project proper.

Mr. ROGERS. You may summarize your statement briefly, Mr. Banner, if you will, please.

Mr. BANNER. Briefly, there are just a few major points involved, particularly those that are in addition to our testimony for Senate bill 3648.

The first point is that the town of Gallup at the present time is in the situation of having a very short water supply, and their ability to obtain additional supplies other than the San Juan River is somewhat doubtful, to any large extent.

Second, since we testified previously, the Navajo Tribe has indicated the desirability of joining with the town of Gallup for a joint-use facility to provide a municipal supply for Navajo schools between Newcomb and the Window-Rock-Fort Defiance area.

The town of Gallup has consistently asked for 15,000 acre-feet of water to be supplied from the Navajo Dam. The uses that have been added for the Navajos since that time would indicate an additional 5,000 acre-feet, making 20,000 acre-feet that it is believed will be needed for municipal supply in that area for this project.

The costs, exclusive of the necessary charges which we just mentioned to convey water from the Navajo Reservoir, are believed to be between 25 to 40 cents per thousand gallons. This is within the range of present water charges at Gallup.

Mr. ROGERS. Thank you, Mr. Banner.

Mr. Sisk, have you any questions?

Mr. SISK. No questions.

Mr. ROGERS. Mr. Saund?

Mr. SAUND. Thank you, Mr. Chairman.

Mr. Junker, I do not have a copy of your statement, but when you were reading your statement I observed you said "particularly the Navajo Indian irrigation project." What did you mean by that? Are you supporting this project?

Mr. Junker, do you have your statement in front of you?

Mr. JUNKER. We are tied in to them and expect to get our water in cooperation with them through a mutual pipeline. We are in support of the overall picture.

Mr. SAUND. Particularly the Navajo project, is that correct? You used that expression. I want to find out what you meant by it.

Mr. BANNER. I think I can answer that on the map, if I may take a moment. The water supply for the pipeline for Gallup and the municipal supply for the Navajos begins here, which is the lower end of the Navajo project. Without the Navajo project, there is no water for Gallup.

Mr. SAUND. Why did he say "particularly the Navajo project"? Is it because the Navajo project is the only project necessary to supply water for the city of Gallup, N. Mex.?

Mr. BANNER. That is correct, sir. Without it, we would have no water.

Mr. SAUND. Mr. Chairman, our previous witness was asked a question by the gentleman from New Mexico regarding the quality of water, and so forth. Bearing in mind that the quality of water is considered important in this project, I believe it would be very appropriate that we have a full hearing and action on my resolution that the Secretary of the Interior make a study of the Colorado River water.

Mr. ROGERS. The Chair indicated to the gentleman from California that he is working as much as possible to get that resolution acted upon in the very near future.

Mr. SAUND. I know you considered it sufficiently important and the subcommittee did go to my district to make a study.

Mr. ROGERS. We hope to get this whole water problem settled in the entire area. It probably will not be this year, however.

Mr. Morris.

Mr. MORRIS. No questions, Mr. Chairman. I just wish to commend the gentlemen for their very fine statements and thank them for appearing before the subcommittee.

Mr. ROGERS. Thank you, gentlemen, for your contribution to the record at this point.

The next witness is Mr. Edmund L. Engel, city manager, Albuquerque, N. Mex.

STATEMENT OF EDMUND L. ENGEL, CITY MANAGER, CITY OF ALBUQUERQUE, N. MEX.

Mr. ENGEL. Mr. Chairman, if I may submit my statement for the record, I think I might be able to summarize it and save some of your time.

Mr. ROGERS. Thank you, Mr. Engel. I think that would be very well and helpful to the committee, because time is running short. Without objection, the statement of Mr. Edmund L. Engel, city manager of the city of Albuquerque, in support of the San Juan-Chama transmountain diversion project, will be included in the record at this point.

(The statement referred to follows:)

STATEMENT BY EDMUND L. ENGEL, CITY MANAGER OF THE CITY OF ALBUQUERQUE

Mr. Chairman and members of the committee, my name is Edmund L. Engel and I am city manager of the city of Albuquerque, N. Mex. I am here to support, on behalf of the city commission and the citizens of Alburquerque, the proposed San Juan-Chama transmountain diversion project which would authorize the diversion of San Juan River water into the Rio Grande River for use by residents of the Rio Grande Valley.

The orderly development of water resources is of major significance to urban areas, particularly to those located in arid regions such as the upper Rio Grande Valley. Deficiency of water supply in these regions can severely alter or inhibit the growth pattern of cities and the surrounding economically dependent areas.

Albuquerque's chief source of water supply is the underground reservoir of the Rio Grande depression. In recent years we have developed this source to a high degree in order to meet the increased water needs of Albuquerque's rapidly expanding population. Slowly dropping water tables in the area, however, indicate that the underground water supply is definitely limited. The continued growth and prosperity of Albuquerque and central New Mexico is dependent on the development of water resources to supplement those of the underground basin. We in Albuquerque feel that the San Juan-Chama project is the most feasible method of supplementing our water supply. Development of this resource is contingent on decisions of the National Government and for this reason I want to give the committee an estimate of future water needs and the implications of Federal Government activities within the Albuquerque standard metropolitan area.

FUTURE WATER NEEDS

The year 1956 has been selected as the base year on which estimates of future water consumption are projected. Population served by water systems of the Albuquerque standard metropolitan area in 1956 was estimated by the city planning department to be 210,000 people. These persons utilized 56,100 acre-feet of water for nonagricultural purposes—or an average per capita consumption of 195 gallons per day. This figure includes industrial, commercial, and public uses of water. The capacity of the present city water system is 69.4 million gallons per day. Additions to the system which were completed during the summer of 1959 have added 29.4 million gallons per day to the plant's capacity, for a total capacity this year of 98.8 million gallons per day.

Future water needs are contingent on the size of the population to be served (domestic, commercial, industrial, and public users) and the consumptive pattern of the population. Estimates of future population, based on current growth trends and approximations of employment opportunities within the areas in terms of basic and nonbasic employment, indicate that by 1975 the area will have between 475,000 and 562,000 persons.[1] The curve of population growth is estimated to remain constant or perhaps to increase in steepness of slope during this period.

For cities in arid regions the average annual rate of increase in per capita water use is 4 gallons per capita per day.[2] This increase results from new developments in sanitary technology, new household appliances, air conditioning and refrigeration, and changes in water use habits. Albuquerque has been growing at a remarkably rapid rate. This rapid growth will result in a water demand for public uses, such as parks and recreation facilities, of 2.7 times the amount of water currently used for these purposes. The present trend of consumption for all purposes but agriculture in the Albuquerque area, shows an average annual rate of increase in per capita use of 4.15 gallons per day. If this rate is projected to 1975, the rate of water use will be 275 gallons per capita per day. The per capita water figures, when adjusted to the population estimate for 1975, indicates a demand for 147,000 to 172,000 acre-feet of water during that year. These figures are summarized in table I.

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[1] Population studies used in determining these figures are: Daniel A. Evatt and Gordon Herkenhoff, "Technical Financial Report on the Water and Sewer Systems of the City of Albuquerque, N. Mex.," September 1956. Ralph L. Edgel, "Projection of the Population of Metropolitan Albuquerque to the Year 2000 A.D.," dittoed pages with tables, May 17, 1956. Rolph L. Edgel, "Projection of Population for New Mexico Counties to 1965," Business Information Series, No. 33, June 1957.

[2] Leon W. Jackson, "Municipal and Industrial Water Requirements and Problems." A Symposium on Problems of the Upper Rio Grande: An Arid Zone River, U.S. Commission for Arid Resource Improvement and Development, publication No. 1, 1957, p. 17.

TABLE I.—*Estimated water use and population, Albuquerque standard metropolitan area, 1956–75*

	1956	1975
Population	210,000	475,000–562,000
Water needs:		
Per capita (gallons per day)	195	275
Total demand (acre-feet)	56,030	146,000–172,000

Based on these figures, the 1975 average daily demand will be 131 to 153 million gallons of water. It must be remembered, however, that these are average daily figures. During the peak consumption periods of midsummer, water consumption in Albuquerque is double the annual daily average. Using the maximum estimated population for 1975, peak daily water consumption will be 306 million gallons. This is more than three times greater than the capacity of the system after completion of improvements under construction.

EMPLOYMENT OF INCOME ANALYSIS

Albuquerque's economy is heavily dependent on Government expenditure. In 1956, 22,050 of 71,050 employed persons in the Albuquerque standard metropolitan area were employed by units of Government.[8] Of these, 16,675 were employed by the U.S. Government. Income from Government employment accounted for 23.4 percent of all income payments in 1956.

In addition to the direct Government employment mentioned above, Government expenditures for defense purposes contributed indirectly to other employment, principally manufacturing, in the Albuquerque area. Direct and indirect Government employment accounted for 33.1 percent of all employment in 1956. When basic employment is considered, the percentage is higher. (Basic employment is concerned with goods, services, and capital for export to consumers outside the Albuquerque standard metropolitan area.) The National Government alone contributed directly and indirectly 60 percent of basic employment. Direct and indirect income payments by governmental agencies yielded 51.6 percet of total income payments (3.8 percent direct and 18 percent indirect).

Federal employment has important implications upon water consumption in the Albuquerque area. If the total number of persons employed in 1956 is divided into total population of the Albuquerque area, the resulting ratio is 1 employee to each 2.96 of the total population. By applying this ratio to the number of National Government employees it can be estimated that direct and indirect National Government payroll expenditures provided support for approximately 126,000 persons in 1956. These 126,000 persons used approximately 27,740 acre-feet of water—or 49 percent of the total water used in the Albuquerque standard metropolitan area.

NATIONAL DEFENSE REQUIREMENTS

The Rio Grande Valley in New Mexico has there major areas where the impact of national defense operations on the economy is significant. These are the Atomic Energy Laboratories at Los Alamos, the combined Kirtland Field-Sandia Base installations at Albuquerque, and the Holloman Air Force Base-White Sands Missile Range near Alamogordo and Las Cruces.

Their water problems are definitely interrelated with those of the Rio Grande underground water basin, and thus are a part of the complex pattern of development that has occurred throughout the valley, which is one of the most vital areas in the national defense programs.

Long before the establishment of the national defense installations the surface waters of the Rio Grande were recognized as being fully appropriated. Since the Rio Grande compact was ratified in 1938, essentially every new application to appropriate waters from this stream has been protested and denied.

The defense installations have contributed their share to the water supply problems of the basin. Los Alamos, completely a defense installation, is a town of more than 13,000 people. On the basis of estimates developed in the

[8] Andrew W. Wilson, "The Economic Supports of Albuquerque, N. Mex.," City of Albuquerque, Planning Department, unpublished report.

San Juan-Chama project studies, its annual use of water is in excess of 2,000 acre-feet. Estimates developed by the Albuquerque Planning Department's staff indicate that some 27,000 acre-feet of water annually are used in the Albuquerque area by people directly or indirectly involved in national defense activities. Similarly, at Las Cruces the water used by the increased population brought in by defense activities is estimated to be at least 2,000 acre-feet annually. Coming from a fully appropriated stream, this amount of water consumption is significant and, in itself, is an adequate basis for Albuquerque to plead its cause.

The future needs of these defense installations are even more important. Without referring to any specific plans, we can point out that all such installations normally can expect a reasonable rate of growth and a reasonable increase in water needs. At the same time, it is only prudent to prepare for unforeseen requirements, some of which might be quite large.

In summary, I want to emphasize three points: First, authorization of the San Juan-Chama diversion project is essential to protect all of the present water users as well as to assure a firm supply for the defense installations in the Rio Grande Basin; second, Federal expenditures have played an important part in the expansion of demands for Rio Grande Basin water; and, third, development of all available water resources is necessary for continued improvement of the economy of the cities and small villages of the Rio Grande watershed.

This is not to assume that Albuquerque's future growth will be conditioned by corresponding expansion of government services. Permits for commercial and residential construction issued by the city building department during 1958 totaled $66,635,404, compared with total building permits of $36,327,748 in 1957. During 1959, building permits totaling $69,660,284 were issued. This demonstrates a remarkable growth in Albuquerque's economy, especially when it is remembered that 1958 was a year in which Government operations were not expanded in Albuquerque and the rest of the country was experiencing a recession.

To maintain this rate of growth, water supplies in Albuquerque must be greatly expanded. The city commission has a master plan requiring expenditure of $9 million during the next 2 years for expansion of city water facilities. The gradually falling level of ground water in the Rio Grande Basin, however, indicates that this source of water is in danger of depletion. Only by obtaining its proposed share of San Juan River water can Albuquerque cope with its greatly expanding needs.

Thus, on behalf of the citizens of Albuquerque, whom I represent, we urgently request this committee to weigh the evidence and remember that your action today will have tremendous significance for the growth and prosperity of Albuquerque and New Mexico tomorrow. We need your help now.

I thank you for the privilege of appearing before you today and the opportunity which is mine to plead the cause of some 200,000 people in Albuquerque who speak not only for themselves but for those other persons to the north and south of us who urgently need the water from the San Juan-Chama project. Again, I thank you.

Mr. ROGERS. You may proceed to summarize your statement, Mr. Engel.

Mr. ENGEL. My name is Edmund L. Engel, city manager of the city of Albuquerque.

I am authorized by the city commission of the city to appear before this committee.

My statement is intended to show the future needs for water by the city.

Albuquerque's chief source of supply is the water in the underground basin of the Rio Grande.

In recent years the city has developed its water supply to a very great extent, which has resulted in an appreciable and noticeable lowering of the water table. This is positive evidence, of course, that replenishment will be needed.

We feel in Albuquerque that the San Juan-Chama transmountain diversion is our only practical method of obtaining water for this purpose.

The population of the Albuquerque metropolitan area is estimated at 250,000. These persons utilize approximately 65,000 acre-feet of water a year.

I should like to mention that the present per capita consumption is 195 gallons per day. Projecting this figure into the future, 1975, the per capita consumption may be estimated at approximately 245 gallons per day. Likewise, projecting the population of the metropolitan area to the year 1975, combined with the estimated per capita increase, the total needs of the metropolitan area in acre-feet is estimated at 146,000 to 172,000 acre-feet a year. This is based on population projections, which would give that area approximately 475,000 to 562,000 persons.

I should like to mention briefly the impact and the support to the economy of Albuquerque based on Federal Government employment. Of the approximately 71,000 persons employed in the metropolitan area, 17,000 are employed by the U.S. Government. This means that about 49 percent of the amount of water used in our metropolitan area is consumed by persons working for the Federal Government.

In addition to the area in Albuquerque, where approximately 124,000 persons are directly or indirectly supported by Federal payrolls, there are two other vital areas in the Rio Grande Valley vital to national defense. As you know, the Los Alamos area and the Las Cruces area, which contains the White Sands Proving Grounds, are supplied by water from the Rio Grande Basin. Theyy, too, take from the same source as the city of Albuquerque.

I should like to give you a little indication of Albuquerque's growth by indicating the amount of building which has taken place in the city in the last several years. This is private building and not connected with Federal Government installations. In the year 1958, there were $66 million in building permits; in 1959, $69 million. I believe this shows that the private economy of the city is increasing at a very rapid pace. In the next 2 years the city of Albuquerque is planning to expend $9 million for the improvement of its water system.

As this population increases—and, as I say, we anticipate in 1975 approximately half a million people—we must increase the water supply to keep our underground water basin adequate. We supply the city entirely from deep water wells, which of course draw on the underground basin, which is replenished by the Rio Grande.

I think there are three important points in my statement: That this San Juan-Chama transmountain diversion is vital to the entire Rio Grande Valley; that the diversion has an important bearing on vital defense installations in the Rio Grande Valley; and that, of course, the development of these water resources is essential to the continued growth and improvement of our area.

I thank you.

Mr. ROGERS. Thank you, Mr. Engel.

Just one observation so there will not be any misunderstanding. You do not mean to tell the committee if they would move all the Federal employees out of there, your water problem would be solved?

Mr. ENGEL. No, sir. That is particularly why I mentioned the number of building permits in private activity.

Mr. ROGERS. Mr. Aspinall.

Mr. ASPINALL. Mr. Engel, will you tell me what percentage of the municipal water allocation referred to in this legislation and the report is to be used by the city of Albuquerque?

Mr. ENGEL. The city has applied for 50,000 acre-feet of the 110,000.

Mr. ASPINALL. Do I understand from what you said that the 50,000 acre-feet of water for municipal purposes are all to be used by Albuquerque and the other 60,000 acre-feet of water are to be used for agricultural purposes?

Mr. ENGEL. No. I cannot give you the breakdown of the remaining 60,000 acre-feet, but Albuquerque's petition is for 50,000. I am sorry I cannot give you the breakdown of the rest.

Mr. ASPINALL. You are ready to sign a contract before construction starts to the effect that you will use the amount of water available and pay for the project?

Mr. ENGEL. That is correct, sir. The city commission has approved negotiations on a contract for that water.

Mr. ASPINALL. You have talked over the question of price, I suppose?

Mr. ENGEL. It will cost the city approximately $1 million a year.

Mr. ASPINALL. How much will it be an acre-foot?

Mr. ENGEL. It is 7.7 cents a gallon. I do not have it on an acre-foot basis. I think the city will be fully able to support such a payment. Our budget is $16 million, of which approximately $3.5 million is our water supply. As I understand the timetable, it is perhaps 7 or 8 years. I can foresee no difficulty in the city's being able to support that program financially.

Mr. ROGERS. Did you mean to say 7.7 cents a thousand gallons?

Mr. ENGEL. That would be the cost to the city.

Mr. ROGERS. Is that raw water?

Mr. ENGEL. That is raw water. Of course, we have still not gone sufficiently far in our engineering studies to determine whether we should continue with our present method of deep wells or whether it would be preferrable to use it as surface water.

Mr. ROGERS. How deep do you have to go?

Mr. ENGEL. We can get water at 10 feet in some places, but most of our wells, our newest and best wells, are 1,000 to 1,200 feet deep.

Mr. ROGERS. What is that well water costing you now, treated and ready for consumption?

Mr. ENGEL. We do not have to treat it. It is 17 cents a thousand gallons, including pumping costs and all other costs.

Mr. ROGERS. How much do you figure you could pay for this water, that is, treated and ready to use?

Mr. ENGEL. If we used the same method that we are using now, of deep wells——

Mr. ROGERS. No, I mean the water out of this resorvoir.

Mr. ENGEL. You see, we will pull the water out of the underground basin by our deep wells. That water does not require treatment. It is pure, and the quality is such that we do not have to treat it.

The cost of using the water from the San Juan transmountain diversion would be 7.7 cents, plus our cost of pumping it out of the ground and pumping it to the point of use. I cannot give you an exact cost of that. It would be perhaps——

Mr. ROGERS. How high do you figure?

Mr. ENGEL. Twenty-three or twenty-four cents.

Mr. ROGERS. Relating the water need to what you can afford to pay, how much do you think you can afford to pay for this transmountain water?

Mr. ENGEL. We would be able to pay the amount that we have been told it will cost; namely, 7.7 cents per thousand gallons.

Mr. ROGERS. But this water will need to be treated.

Mr. ENGEL. No, sir, not the way we use it. If we use the deepwater wells, it would not have to be treated. We would draw out of the underground basin.

Mr. ASPINALL. As I understand, you are saying the 50,000 acre-feet for which you will pay annually is water which you expect will go down into the ground and will take care of your underground water supply so you can draw it up with your pumps.

Mr. ENGEL. Yes.

Mr. ASPINALL. Whether you get 35,000 acre-feet or 50,000 acre-feet, you will pay for 50,000 acre-feet under the plan you have in mind. In other words, you cannot tell exactly what is going to go in the ground.

Mr. ENGEL. Actually, I do not think we have gone far enough in the negotiation to say positively how much we can take if the project is consummated in 8 years. It depends entirely on the population rate of growth how much we actually need at that point.

Mr. ASPINALL. I am suggesting to you that somebody will have to contract for this 50,000 acre-feet of water and pay for it annually from the time it is ready.

Mr. ENGEL. Yes. As I say, the city is prepared to make the payments, which amount to a little more than a million dollars a year.

Mr. ASPINALL. That is all.

Mr. ROGERS. Mr. Sisk.

Mr. SISK. Mr. Chairman, I have only one comment to make.

Of course I am completely sympathetic to this project, as I am to all reclamation projects. I believe very strongly in this. However, I do think some of us come in and attempt to make a case because of Federal employees. I do not look with too much sympathy on that, because we are all seeking Federal installations in our areas generally, and therefore we seem to be quite happy having Federal employees. I simply want to say I think you made a good statement. I do not necessarily agree the mere fact these people are Federal employees adds too much weight to your case, although I realize they are people. I imagine other districts would be very happy to have Federal installations if just moving these people out would solve your water situation, and I am sure you do not want to do that.

That is all, Mr. Chairman.

Mr. ROGERS. Mr. Saund.

Mr. SAUND. Mr. Engel, are you related to the U.S. Senator from California in any way?

Mr. ENGEL. No, I am not.

Mr. SAUND. What do you mean by the 50,000 acre-feet? You would take 50,000 acre-feet?

Mr. ENGEL. That is correct.

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Mr. SAUND. In your answer to the chairman of the full committee, you were not certain how much you would be able to take. I was confused.

Mr. ENGEL. We shall have to take 50,000 acre-feet. That would be our contract. What I tried to say was, when this project is finished in 8 or 10 years, whether we can beneficially use the entire 50,000 acre-feet, I am not sure. It depends on the rate of growth.

Mr. SAUND. In your statement on page No. 2 you use this language:

We in Albuquerque feel that the San Juan-Chama project is the most feasible method of supplementing water supply.

What do you mean by "most feasible"?

Mr. ENGEL. I think the only other method I have heard of by which any water could be brought into Albuquerque would be perhaps a single pipeline, which I do not think the city of Albuquerque could afford all by itself. We have to get water from the San Juan-Chama. I know of no other source available to us. By that I mean a method of getting it to the city.

Mr. SAUND. I have visited your city. I am sorry I was there for only 1 day. I think next to Palm Springs, it is one of the best resort areas that I know of. It is a beautiful city. Do you mean to tell me if the Federal installations were closed, which could happen at any time—it happened in my district—then you would not need so much water and you would be able to take care of your $1 million payment just the same?

Mr. ENGEL. I am hoping what you suggest does not happen, of course. We are seeking private industry. Our building permits have been at a very high rate for the population that we now have. We have 200,000 population, and about $70 million of building permits is quite large for a city of that size. In fact, we ranked in building permits above a number of larger cities in the years 1959 and 1958.

So I am hoping that our private economy will increase to such a point that we can carry on.

I believe when a city reaches the size we are, with the resources we have, there is quite a likelihood that the increase will continue. As a matter of fact, Congressman, I lived in Los Angeles for 17 years, from 1933 to 1950, in the planning department, and watched the growth of that area. I though it would stop sometime, but it never did.

Mr. SAUND. I believe in the future, no doubt about that. I was just asking.

Mr. ENGEL. I think our growth will probably continue.

Mr. SAUND. Are you familiar with the Water Supply Act of 1958?

Mr. ENGEL. I am not familiar with that.

Mr. SAUND. You have never given any study to that?

Mr. ENGEL. Not very familiar; no, sir.

Mr. SAUND. Thank you.

Mr. ROGERS. Mr. Morris.

Mr. MORRIS. I would like to commend Mr. Engel for a fine statement. I would like for you to have the committee understand now that the city of Albuquerque is willing to enter into a contract, an obligation, to pay for 50,000 acre-feet of water regardless of whether you use 30,000 acre-feet, 40,000 acre-feet, or 49,000 acre-feet; is that right?

Mr. ENGEL. Yes, that is correct.

Mr. MORRIS. That is all.

Mr. ROGERS. Thank you, Mr. Engel, for your contribution to the record.

Our next witness is Mr. John Patrick Murphy, executive secretary, Middle Rio Grande Flood Control Association.

STATEMENT OF JOHN PATRICK MURPHY, EXECUTIVE SECRETARY, MIDDLE RIO GRANDE FLOOD CONTROL ASSOCIATION

Mr. MURPHY. Mr. Chairman, I have asked Mr. Ball to sit up here with me because we are going to brief our statements.

Mr. ROGERS. Mr. Hubert Ball, chief engineer, Middle Rio Grande Conservancy District.

Mr. MURPHY. Mr. Chairman, I have a prepared statement.

Mr. ROGERS. Without objection, the statement will be included in full.

(Mr. Murphy's prepared statement follows:)

STATEMENT BY JOHN PATRICK MURPHY, EXECUTIVE SECRETARY, MIDDLE RIO GRANDE FLOOD CONTROL ASSOCIATION

Mr. Chairman and members of the committee, first of all, I want to express to the committee our appreciation, and the appreciation of all the people whom I represent, for the fine treatment we were accorded by this committee when we appeared before you in 1954 on the upper Colorado River storage project.

My name is John Patrick Murphy and I am executive secretary of the Middle Rio Grande Flood Control Association. I have been authorized by the people whom I represent, to appear on their behalf and present their views in support of the bill, to authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, and for other purposes.

The organization I represent, is made up of a voluntary, grassroots group of farmers, business and professional men, housewives, schoolteachers, office employees, and other persons who have united in this manner to support the urgently needed San Juan-Chama project. We have 2,000 members which includes every chamber of commerce in the middle Rio Grande Valley from Elephant Butte Reservoir on the south to the Colorado State line on the north. This area includes the counties of Sierra, Socorro, Valencia, Bernalillo, Sandoval, Santa Fe, Los Alamos, Rio Arriba, and Taos. The recent population estimate is 532,800 people.

Numerous large meetings were held over the past several years in the principal cities and county seats of each and every one of these counties, and, in every instance, the pleas for supplemental water for irrigation purposes were actually pitiful. The plight of these farmers is serious and in most cases desperate. It is difficult to imagine anyone in a more discouraging situation than a farmer attempting to make a living from an irrigated farm with only a partial supply of water.

Ofttimes he cannot raise the crops for which the land is particularly adapted and for which there is a ready market at a fair profit. On the contrary, he is forced to raise only those crops which can be matured with a limited water supply regardless of the need or market value for such crops. He cannot plan rotation of crops which is universally recognized as the essence of good farming.

He watches his cost of operations mount steadily, but his income is held down by an inadequate water supply. In short, he finds himself facing an almost impossible situation.

The two northern counties, Taos and Rio Arriba, where we are pleading for supplemental water in the amount of 29,900 acre-feet on an exchange basis for the four small irrigation units referred to as Cerro, Taos, Llano, and Pojoaque. are classified as terribly depressed rural areas whose economic condition could be materially improved by an adequate irrigation water supply. For instance: Taos County, with a per capita income of $635 per year and Rio Arriba, with one of only $537 per year illustrates this condition. This is less than half of the State average.

I would like to point out that in a report rendered December 11, 1950, by the President's Water Resources Policy Commission they stated that "the Rio Grande Basin was a sick area" and "importation of water from other basins was essential." In the recommendation of importation of water they were referring to the San Juan River waters recently allocated to New Mexico.

All of the waters in the Rio Grande are completely appropriated. In fact, they are overappropriated. Therefore, it follows that we also have grave water problems developing in our municipalities. Citing one instance: The 1950 Bureau of the Census report declared Albuquerque a metropolitan area with a population of 145,673.

The Albuquerque metropolitan area registered the most rapid population growth of any of the 168 metropolitan areas listed by the Federal Government between 1940 and 1950. The increase was 110.4 percent. The statistical department of the Southern Union Gas Co. has released estimates of expected population for Metropolitan Albuquerque by 1960 to be 250,000. The University of New Mexico estimates 321,600 and by 1965 predicts a population of 434,600.

And then to emphasize our dynamic growth, let me quote population comparisons from 1940 projections of population increases for the counties in the Middle Rio Grande Basin by the Bureau of Business Research, University of New Mexico to the year 1965, just 7 years hence:

	1940	1950	1955	1960	1965
Taos	18,528	17,146	14,800	14,200	14,500
Rio Arriba	25,352	24,997	28,800	29,700	32,000
Los Alamos	----------	10,476	13,000	14,000	14,000
Santa Fe	30,826	38,153	38,900	40,300	48,500
Sandoval	13,898	12,438	12,100	11,500	15,200
Bernalillo	69,391	145,673	205,500	321,600	434,600
Valencia	20,245	22,481	21,900	41,100	50,500
Socorro	11,422	9,670	9,200	8,900	8,800
Sierra	6,962	7,186	5,800	5,100	5,100
Dona Ana	30,411	39,557	44,600	46,400	52,400
Total	227,035	327,777	391,600	532,800	675,600

This shows that the counties within the Middle Rio Grande Basin have, in the decade between 1940 and 1950, gained 100,742 in population. And the 10 years between 1950 and 1960 the gain is estimated at 205,023.

There is consequently a tremendous amount of pumping of water for municipal supply in the Middle Rio Grande Valley; and the present interpretation of, and operations under, the Rio Grande compact, results in New Mexico being in continuous debt to Texas.

All of the cities and towns in the valley continue to show tremendous growth in population, and it was estimated that in 1956, Metropolitan Albuquerque used over 50,000 acre-feet of water.

According to estimates used by local utility companies for their future planning on expansion of facilities, they estimate that by the year 2001, Metropolitan Albuquerque will be 730,000, with a water requirement of 204,000 acre-feet per year. This is an ultraconservative estimate because the Bureau of Business Research of the University of New Mexico estimates Metropolitan Albuquerque to have a population of 1,500,000 by the year 2001.

We believe, since this water very definitely is subtracted from the water available to the agricultural interests, that every effort should be made to replace Rio Grande water, or to directly supply the various municipalities, which are the major users of water for domestic purposes. The only source available to us for this purpose is the water of the San Juan River.

INDIANS

There are 6,000 Indians living in 9 pueblos in the Middle Rio Grande Valley. They are Santo Domingo, Isleta, San Felipe, San Juan, Sandia, Cochiti, Santa Clara, Santa Anna, and San Ildefonso. There are also a great many Indians living within the Taos, Llano, and Pojoaque irrigation units.

Agriculture is the principal economy of these Indians, who are now being seriously threatened by a shortage of water, along with their neighbors. These Indians would directly benefit, and be assured of a continuance of their long-established livelihood, with the proposed program of a San Juan-Chama diversion of additional water.

NATIONAL DEFENSE

New Mexico is one of the most vital areas in the national-defense program.

We stress the national-defense angle of our project, because, extremely important defense establishments have been located in the middle valley. Some of these installations include Los Alamos Atomic Laboratories, Sandia Atomic Laboratories, Sandia Armed Forces special-weapons project, Kirtland Air Force Base, Holloman Air Force Base-White Sands Missile Range installations near Alamogordo, and others, such as industries related to national defense.

These important installations all consume great quantities of precious water and it is essential to do everything in our power to assure these endeavors of an adequate supply of this water for future expansion in behalf of national defense. Therefore, they, too, are in need of this San Juan-Chama project.

The solution of these water problems is one of the most pressing needs of the State of New Mexico. The only hope for maintaining the existing economy and providing for a normal, continued growth in these areas is to import additional waters. The San Juan River is the only source available. It truly is our last waterhole.

From here on, New Mexico's future growth will be limited only by its water supply; therefore it is imperative for us to develop this new water to its optimum, beneficial use and to conserve every drop of this precious resource.

Multiple-purpose projects such as the San Juan-Chama project for municipal, industrial, and irrigation water are not matters to be put off pending a recession or depression. On the contrary, such projects should be constructed as rapidly as possible so as to contribute toward continued prosperity and a high standard of living. New Mexico, in fact, needs this project now to preserve its land and water resources.

New Mexico's economic health and growth are wholly dependent on water. Our usable water supplies, always a grave concern, are today critically short and failing further every day. Droughts always have hit New Mexico hard. They have made our economy "sick" too often, too long. Our people are paying an enormous price for the delay in the apportionment of the use of the waters of the upper Colorado River and its tributaries.

For years and years that much-needed water has been flowing right out of our State. New Mexico is deriving no benefit from it. It is imperative that this waste be stopped as soon as is humanly possible.

Utilization of these now-unused waters of the San Juan—of transcendent importance to the Middle Rio Grande Valley—has been envisioned for over 20 years.

In conclusion, I sincerely hope that we have convinced this committee that water is the veritable lifeblood of New Mexico and that our potential uses far exceed the present supply; and it is imperative, therefore, that the Federal Government authorize the construction of essential facilities that will enable New Mexico to get and use its rightful share of the waters of the San Juan River and its tributaries.

We join wholeheartedly with the witnesses supporting the Navajo Indian irrigation project, which includes municipal and industrial water for the Farmington and Gallup area; thus, we join in the urgent plea for full approval of the bill to authorize and maintain the Navajo irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, and for other purposes.

The President and the Congress are to be commended for having enacted into law the Colorado River storage project, in which they granted—along with others—conditional authorization to the Navajo Indian irrigation project and the San Juan-Chama project. They also spelled out priority for the completion of our reports.

This wording appears in section 2 of Public Law 485, and reads as follows:

"In carrying out further investigations of projects under the Federal reclamation laws in the Upper Colorado River Basin, the Secretary shall give priority to completion of planning reports on the Gooseberry, San Juan-Chama, Navajo, Parshall, Troublesome, Rabbit Ear, Eagle Divide, San Miguel, West Divide, Bluestone, Battlement Mesa, Tomichi Creek, East River, Ohio Creek, Fruitland Mesa, Bostwick Park, Grand Mesa, Dallas Creek, Savery-Pot Hook, Dolores, Fruit Growers Extension, Animas-La Plata, Yellow Jacket, and Sublette participating projects. Said reports shall be completed as expeditiously as funds are made available therefor and shall be submitted promptly to the affected States, which in the case of the San Juan-Chama project shall include the State of Texas, and thereafter to the President and the Congress: *Provided*, That with reference to

the plans and specifications for the San Juan-Chama project, the storage for control and regulation of water imported from the San Juan River shall (1) be limited to a single offstream dam and reservoir on a tributary of the Chama River; (2) be used solely for control and regulation and no power facilities shall be established, installed or operated thereat; and (3) be operated at all times by the Bureau of Reclamation of the Department of the Interior in strict compliance with the Rio Grande Compact as administered by the Rio Grande Compact Commission. The preparation of detailed designs and specifications for the works proposed to be constructed in connection with projects shall be carried as far forward as the investigations thereof indicate is reasonable in the circumstances."

All of those specific specifications have been complied with.

We have been given to understand that the opponents to these participating projects will bring forth the same type of arguments used in opposing approval of the Colorado River storage project; thus, we feel sure that Congress, in its wisdom, will again decide to approve these participating projects.

I appreciate the opportunity to appear here today, and, on behalf of the 500,000 anxious people in the Middle Rio Grande Valley whom I represent, I wish to say "Thank you for your kind attention."

Mr. MURPHY. My name is John Patrick Murphy and I am executive secretary of the Middle Rio Grande Flood Control Association. I have been authorized by the people whom I represent to appear on their behalf and to present their views in support of the bill to authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, and for other purposes.

The area I represent covers the counties of Sierra, Socorro, Valencia, Bernalillo, Sandoval, Santa Fe, Los Alamos, Rio Arriba, and Taos. The area includes 532,800 people.

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There are 6,000 Indians living in nine pueblos in the Middle Rio Grande Valley. They are: Santo Domingo, Isleta, San Felipe, San Juan, Sandia, Cochiti, Santa Clara, Santa Ana, and San Ildefonso. There are also a great many Indians living within the Taos, Llano, and Pojoaque irrigation units.

Agriculture is the principal economy of these Indians, who are now being seriously threatened by a shortage of water, along with their neighbors. These Indians would directly benefit, and be assured of a continuance of their long-established livelihood, with the proposed program of a San Juan-Chama diversion of additional water.

The solution of these water problems is one of the most pressing needs of the State of New Mexico. The only hope for maintaining the existing economy and providing for a normal, continued growth in these areas is to import additional waters. The San Juan River is the only source available. It truly is our last waterhole.

From here on, New Mexico's future growth will be limited only by its water supply. Therefore, it is imperative for us to develop this new water to its optimum beneficial use and to conserve every drop of this precious resource.

We join wholeheartedly with the witnesses supporting the Navajo Indian irrigation project, which includes municipal and industrial water for the Farmington and Gallup area. Thus, we join in the urgent plea for full approval of the bill, to authorize and maintain the Navajo irrigation project and the initial stage of the San Juan-Chama project as participating projects for the Colorado River storage project, and for other purposes.

I appreciate the opportunity of appearing here today and, on behalf of the 500,000 anxious people in the Middle Rio Grande Valley whom I represent, I wish to say thank you for your kind attention.

Mr. Chairman, in addition, I have a few statements from these poor people up in the north part there. They are short ones. I would like to have them included. These are statements from Mrs. Frances R. Shipman, Pablo Roybal, W. A. Williams, Jr., Filiberto Maestas, W. P. Cater, and Andres A. Martinez.

Mr. ROGERS. Thank you, Mr. Murphy. You disturb me when you put in here that the San Juan is the last waterhole. What is worrying me is what you folks are going to do when you use up this water.

Mr. MURPHY. We do not know.

Mr. ROGERS. You will cross that bridge when you get to it?

Mr. MURPHY. We are in a semiarid district and we just do not know.

Mr. ROGERS. I know. My district is right across the line from you there, the panhandle area. I very well know the situation with which you are faced insofar as water is concerned.

Mr. MURPHY. You can pay for water what you can frugally afford to pay in your economy. Maybe we can pipe it over from the Missouri or the Mississippi.

Mr. ROGERS. The only trouble about that is you have about a 3,500-foot lift. I do not know what we would lift it with.

Are there any questions?

Mr. SAUND. Mr. Murphy, on the first page of your statement you say:

> The Navajo Indian irrigation project and the initial stage of the San Juan-Chama project * * *.

What do you mean by initial stage?

Mr. MURPHY. Our San Juan-Chama project was originally measured out to be 235,000 acre-feet of water, but we had to pay for this water, and then we had an agreement with the people up in the San Juan area that maybe 235,000 acre-feet of water was too much, maybe they could use some of that. We have an agreement with them that we will take our 110,000 acre-feet of water as the first stage. Then if 15 or 20 years from now we need this additional water, as the chairman pointed out, if they do not need it in the San Juan Basin, I am sure they would much rather we have it in New Mexico than let it flow on to California, you being from California.

Mr. SAUND. Mr. Murphy, you say this is just part of the 235,000 acre-feet diversion planned; is that right?

Mr. MURPHY. Yes; and all we are asking for is the authorization of the 110,000. If we do need the other 125,000, we will have to come back to Congress again and ask for authorization for the addition.

Mr. SAUND. You say this is part of the 235,000 acre-feet diversion; is that correct?

Mr. MURPHY. That is right.

Mr. SAUND. You mentioned here that you had some letters from the poor people. What do you mean by "poor people"?

Mr. MURPHY. Families living on $435 a year are poor people. We should help them every way we possibly can. Their families have lived there for hundreds of years. It is pathetic.

Mr. SAUND. Mr. Murphy, let me assure you I may be even tempted to support a project if it will help poor people like that. I am for the poor people, no doubt about it.

Mr. MURPHY. They could not get enough money to come here and plead for themselves. I have their written statements. When you read them, you will see what they are talking about.

Mr. SAUND. I want to express my gratitude for your bringing this story here, because I want the poor people to bring their stories before the congressional committees. I am glad somebody will do that for them.

Mr. MURPHY. If we have a full-fledged hearing next year, they will be here, if we have to raise the money to bring them here.

Mr. SAUND. I will contribute to that.

Mr. ROGERS. Mr. Morris.

Mr. MORRIS. Were these poor people to whom we refer in some country across the sea, they would be eligible for mutual security aid and there would not be any question about their getting it. They would not have to come before a committee of Congress for it to be authorized. ICA would just open up the bag and they would help themselves.

Mr. SAUND. If they go to the Bureau of the Budget, they would get it.

Mr. MORRIS. Anybody will give it to them as long as they live outside the continental limits of the United States, but when it comes to helping some people inside the continental limits, we run into problems.

Mr. SAUND. I am serious. If some poor people want to come before a congressional committee, I want to make a contribution for their passage because we should hear from them.

Mr. ROGERS. Is there anything further, Mr. Morris?

Mr. MORRIS. I wish to commend Mr. Murphy for his appearance before the committee.

Mr. ROGERS. Mr. Murphy, let me make this observation. If you will submit the statements you brought in from the people we are talking about, they will be submitted to the ranking minority member of the committee, and if they meet the requirements they will be included in the record, without objection.

Mr. MURPHY. Thank you.

(The statements referred to follow:)

STATEMENT OF MRS. FRANCES R. SHIPMAN

The Pojoaque area where I live is one of the numerous examples of what lack of water can do in New Mexico.

This area is populated by Indians and eager farmers trying to make a living off of their small farms. Since all of these farms are located on both sides of the Pojoaque and Tesuque Rivers, both of which have flat, shallow river beds with the irrigation ditches coming directly off of these rivers, year after year we hopefully plant in the spring and struggle to keep our crops alive with the small trickle of water; and year after year flash floods have raged down these rivers, completely destroying the main heads of the irrigation ditches and depositing anywhere from 6 to 14 inches of silt on the various crops. Much fine farmland has been ruined by this deposit of silt. During the farming

season there is so little water in these rivers that one easily drives across them. Because of the scarcity of water this has been a marginal farming area capable of supporting a limited number of people and the proposed plan should assure adequate crops and permit a larger number of people to live here with reasonable comfort and dignity.

During the late winter and early spring months these rivers run constantly in a heavy stream from the melting snows in the mountains. This is water lost to local farmers. The authorization of this project would store this water so that it could be released when needed. This would not only benefit our area but New Mexico's obligations to the lower part of the State, Texas, and Mexico could easily be met without denying water to anyone.

It is my impression that the national per capita farm income is around $4,100, while New Mexico's is $500—I ask you gentlemen, is this 1960 America? Alaska gained statehood in 1958, Hawaii in 1959—let's give New Mexico water in 1960.

STATEMENT OF PABLO ROYBAL

Mr. Chairman and members of the committee, I am Pablo Roybal from Nambe, N. Mex. (Nambe is a farming community 18 miles north of Santa Fe). I was born and raised in the Pojoaque Valley, Pojoaque being the lower Nambe Valley. We refer to it as either Pojoaque or Nambe. The Nambe River, being a tributary to the Rio Grande, begins its course at the Sangre de Cristo Range, flowing west to the Rio Grande. The valley is a narrow strip of cultivated land about 2 miles wide and 12 miles long. There are approximately 300 farms, with a total of 2,500 acres of land under irrigation; or rather that have been irrigated at one time or another. There are 22 Asequias from which to irrigate these farms. Small but they are very productive. We have very deep fertile soils I dare say, the best soils in the State. The very few years that we have had an ample water supply for irrigation we have made heavy yields of many types of crops.

The Nambe Valley is one of the oldest farming communities in the country. Archeologists have traced it back 700 years. The Indians were farming and using water for irrigation at that time. The Spaniards came into this valley over 300 years ago, and there are farms that have been in the same family for many, many years. Up until the last 10 to 15 years the people in this valley depended entirely on their farm for a living. You may wonder how people can live off such small farms. The fact that families have lived on these farms for hundreds of years is sufficient proof. Now the average farm income in this area is less than $400 a year. Every day it is getting harder and harder to live off that low income. Times have changed so that you and I can agree that it is impossible to make a living from such an income. Yes, we need to increase our production, and to do so we need a more dependable water supply. Our lands are very fertile and capable of producing at least four times as much if we had the right amount of water at the right time. We have farmers who have produced more than $2,000 per acre on specialized crops.

I am 42 years old and as far back as I can remember I have heard my parents, my neighbors, and all the people in the valley talk about the need for more water for irrigation. Ever since I was 12 years old and to the present I have had to run up and down the creek chasing water, dividing water with other ditches and in most cases getting very little irrigating done.

In my 30 years of chasing water we have had good and bad years but I do not believe we have had 5 percent of the time when we had a completely adequate supply during the summer. We have always had unused water in the winter. To my knowledge we have had only 1 year (1956) when we did not have surplus water in the spring. During this period of extra spring water, farmers are busy wasting it; giving their crops more water than they actually need thinking that it might help later. In desperation they load their ditches over their capacity, causing breaks and damage to property and more waste of water. Water usually lasts to the first of July. Then it gets so low we barely have enough for our gardens. Right now, I have 27 acres planted to new alfalfa and unless it rains within 2 weeks I will lose my entire stand. A cash loss of over $1,000 and another year or more behind on my planting. We get a few rains about this time of the year and again we see our water supply go by in big quantities in the form of floods, tearing down the banks and fences, carrying silt to cause damage farther down the stream and causing much damage to the Rio Grande.

Yes, our irrigation water supply needs are not great if measured in acre-feet. Actually all we need is a little supplement. The shortage comes at such time that with most crops it means a complete loss at a time when it is about ready for harvest. Other crops may produce half their possible yield.

Members of the committee, our only solution to the problem is a dam. The proposed San Juan-Chama diversion so that these other dams can be possible, is the answer. We need not fear that this Nambe Dam will be taking somebody elses water. Actually we could well call this a control dam. What we actually need is some way of regulating or distributing the amount of water we use.

The economy of the people in this valley depends on this little extra water. At present we have a good number of people on the relief rolls costing the State of New Mexico and the Nation millions of dollars. Most of this cost could be eliminated if a dependable water supply could be provided.

If we recall, in 1954 our President sent a message to Congress to act on legislation and that could very well be applied in this very particular case. I refer to the message from which the rural development program came into effect. As you well know this program was designed for the purpose of helping farmers in low income areas. As you also know, our county is one of the two pilot counties in New Mexico where this program is to be tried out. One of the main problems selected in our county under the rural development program is soil and water conservation. I ask you now, don't you think that this is a good test case for this very important program? Certainly in this area the greatest help these low-income farmers can get is a means of conserving water to be used when needed, therefore, resulting in increased production from these small farms and ultimately a higher income, meaning also a higher standard of living which, as I have seen, is the main objective of the rural development program.

As I have mentioned before we already have a great number of our people on relief rolls and unless we do something to help them I am afraid we will have more and certainly that is not what we want. We should like to see them self-supporting, and in that way be an asset to the community instead of becoming a liability.

We are anxious to pay our part of the cost. Please help us help ourselves become more substantial citizens. We will make you proud of us by your passing this bill as we will then be able to help build America stronger with our improved economy and tax base.

STATEMENT OF W. A. WILLIAMS, JR.

Mr. Chairman and members of the committee, my name is W. A. Williams, Jr. I am a farmer, born, reared, and still living in Tesuque, which is located in the Pojoaque watershed of New Mexico. I am chairman of the Pojoaque Soil Conservation District, chairman of the New Mexico State Soil Conservation Committee, a director of the National Association of Soil Conservation Districts, and serve on numerous local committees. Please feel free at any time to stop and question me. I have and will continue to voluntarily contribute a large portion of my time in helping to solve a problem in which you gentlemen can be of material assistance. Authorize the construction of the San Juan-Chama transmountain diversion project.

The valley of and the tributary valleys of the upper Rio Grande River in New Mexico, which will receive supplementary irrigation water from the diversion we are speaking of, is the oldest continually inhabited portion of the United States. It is a beautiful land of high mountains, steep foothills, and narrow fertile irrigated valleys. We have an excess of spring runoff water, not enough irrigation water during the vital late spring and early summer months. Providing the storage called for in this authorization is a vital contingent to the continued existence and expansion of this entire area.

The phenomenal population growth of north central New Mexico has intensified the critical need for additional water for farm, urban, and industrial use. The lack of water during the growing season in the tributary irrigation units, as well as the Middle Rio Grande Conservancy District, has made the situation most acute economically. Two problems with which you are vitally concerned are relief rolls and unemployment. These serious problems are brought about in this area, to a great extent, by the lack of authority to store excess water to be used when it is needed, during the growing season.

To my knowledge, owners of small farms, some with as little as $100 a year agricultural income per famly, hired out as farm laborers for as little as $1 and $2 a day up until World War II. Today it is still possible to hire these small farmers and their grown sons for $4 a day. In few cases do they receive more than $6 a day for 10 and 12 hours work. Gentlemen, you are aware that this condition exists in other parts of the world. The area under discussion is recognized as an economically depressed area of the United States. We cannot afford to overlook this situation. The San Juan-Chama diversion will materially assist in correcting this unspeakable evil, and will allow future urban, military, and industrial growth.

The Rio Grande compact prohibits the construction of new facilities for storage of runoff water, for use in the tributary irrigation units. This compact will not allow supplemental water for the Middle Rio Grande Conservancy District, who also lose a substantial part of their crops for lack of summer irrigation water. The San Juan-Chama projects would make additional water available to the Rio Grande, so that through exchange agreements water could be stored and replaced to the compact. This area is classed by the State Employment Security Commission as a labor depressed area. This area is included in the group of low rural income counties singled out by the Department of Agriculture for its special rural development program designed to aid low income groups. The climatic conditions and capability of the soil makes this an area potentially high in the production of fruit and vegetables. Some of the soils have been classified by the Soil Conservation Service soil surveys as some of the best in the Nation. We cannot continue to make these people dependent upon Government agencies for existence.

The rural population, Indian, Spanish-American, and the Anglo are all citizens of the United States, and deserve the right to the American way of life. These people should not be relegated to that of second-class citizens. Soil Conservation District's motto is conservation, development, and self-government. We also stress the use of each acre for maximum sustained production. This is not possible in northern New Mexico without legislation to give us the authority and ability to achieve this goal by being able to store and use surplus water in the critical growing season. A dependable supply of water will allow us to grow more lucrative crops. Watershed protection projects provided for in Public Law 566 will allow us to stabilize our watersheds. We are willing and agreeable to repay our share of the cost.

Percentagewise, we are the fastest growing area of the United States. I and many people from every corner of our Nation believe north-central New Mexico offers opportunities unmatched as a place to live and enjoy life, work, prosper, and advance. The surging metropolis of Albuquerque must have additional water for her people, expanding industries, military and atomic energy installations. Albuquerque has agreed to pay for her water, her lifeblood, 100 percent. We little people will pay to the limit of our ability. Keep us off the relief rolls. Help us hold our heads up and be first-class citizens. We want to help ourselves. Please give us a chance. Approve the San Juan-Chama transmountain diversion project.

Thank you, gentlemen.

Statement of Filiberto Maestas

Mr. Chairman and members of the committee, I am Filiberto Maestas. My hometown is Espanola, N. Mex. I am manager of the Santa Cruz Irrigation District. The people from my home area sent me here to plead for Government assistance in order to obtain supplemental waters so that we may be able to make a living on our small farms.

Realizing that there is no source from where we can obtain supplemental water other than that to which we are entitled under the terms of the Colorado and Upper Colorado River Basin compacts, we naturally are vitally interested in the San Juan-Chama diversion project.

1. DESCRIPTION OF THE AREA

The topography of our area is rough and varied. The range in elevation is from 5,500 feet on the shores of the Rio Grande to 13,700 feet at the eastern boundary which is formed by the Sangre de Cristo Mountains.

The drainage system of the Santa Cruz stream covers an area of approximately 150 square miles. The principal tributaries of the river are the Rio Medio and

the Rio Frijoles. The headwaters of the branches are on the steep western slope of the Sangre de Cristo Mountains and are perennial streams. The Rio Santa Cruz discharges into the Rio Grande 10 miles to the east at the town of Espanola.

The valley proper is a stretch of irrigated bottom land a half mile wide at its eastern portion and about 10 miles long on the eastern borders of the Rio Grande. It is that portion that lies east of the Rio Grande that would tremendously improve if we were to obtain supplemental water.

2. RESOURCES OF THE AREA

(*a*) *Land*

At present the total tilled acreage in the valley is about 4,500 acres, the cash crops being fruits, alfalfa, and truck farming. Fully 75 percent of the land is utilized in the production of these crops. Inasmuch as there is little grazing land available to the population, corn and alfalfa are important sustenance for domestic livestock.

(*b*) *Livestock*

Stockraising for commercial purposes is negligible in the area. Practically all livestock is used domestically.

(*c*) *Craft*

There are approximately 100 weavers in the entire valley. The weaving of Chimayo blankets is one industry which brings outside income. The bulk of the weaving is done during the winter months when the farmland is idle. The finished products are sold to tourists, and some are shipped to Arizona, Colorado, and other States.

(*d*) *Wage work*

Due to the uncertainty of our water supply, hundreds of local people leave home and go to other States to work in mining camps, beetfields, potato fields, and other lines of work.

Most of this labor migrates to the States of Colorado, Wyoming, Montana, California, and Utah. Industrial stagnation in these labor markets and State restrictions on migratory labor have reduced this resource in the last few months. Mr. M. D. Garcia, director of the department of employment, advises that his office this year has sent about 200 men to other States to be employed, and that fully 75 percent of these men could remain at home and farm if only they had the security of a water supply.

3. GOVERNMENT ASSISTANCE

(*a*) *Welfare department*

The director for the welfare department for Rio Arriba County informs me that his office handles 1,671 cases of direct relief at an approximate cost of $101,758 per month to the Government, and that a good portion of these people could become self-sustaining if their water supply was augmented in some way. This fact itself would convert the San Juan-Chama diversion project into a self-liquidating enterprise.

(*b*) *Agriculture conservation program and Farmers Home Administration*

Mr. Clair Seeley, Director for Farmers Home Administration, and Mr. Phil Maestas, Jr., manager, agriculture conservation program for Rio Arriba County, advise as follows:

Out of 77 loans extended by Farmers Home Administration, 22 or about 28 percent are delinquent in their payments due to the fact that perennial streams which sometimes furnish the water to raise the winter feed run dry, thereby leaving only the summer range to be utilized in the northern part of the county.

The office of the agriculture conservation program in the year 1956, which was one of the driest years on record, liquidated eight cases of crop failures due to complete lack of water or the drought.

4. INDIAN LAND

When the San Juan-Chama project materializes, at least about 2,000 acres belonging to the Indians of San Juan Pueblo can be utilized to produce vegetables, fruits, and other farm products that certainly some day will raise the living standards of the Indians.

5. NEEDS OF THE AREA

Adequate water supply

As I previously stated in part 2 of my statement concerning land, we are trying to farm about 4,500 acres of land with a small reservoir that has a capacity of about 4,000 acre-feet, and it takes on an average of about 3 acre-feet of water to produce a crop of our area. The Santa Cruz Irrigation District has a standing permit from the State engineer's office for New Mexico to impound 10,000 acre-feet of water, but due to economical reasons the dam has not been built to impound the said amount. In the year 1959, when the farmers of our valley started planting their crops, we had 2,050 acre-feet in storage, and the inflow during the year was 6,780 acre-feet, making a total of 8,830 acre-feet. Considering that we lose at least 20 percent through seepage and evaporation, it left only 1.57 acre-feet available for constructive use, which resulted in a serious loss to the inhabitants of our valley.

In essence, the people of Llano and the area east of Espanola strongly and respectfully request the Congress of the United States to authorize the San Juan-Chama diversion project, and that once the San Juan-Chama project becomes a reality, as we hope it will be, a high-line canal be constructed starting at a point about 15 miles northeast of the town of Espanola on the east bank of the Rio Grande which will convey water to about 2,000 acres of Indian land, and about 2,800 acres of the east end of the Santa Cruz Irrigation District.

In conclusion, I wish to express my gratitude for this opportunity to appear on behalf of the people of the Espanola area and to urge your early and favorable action on this bill to authorize construction of the San Juan-Chama project.

STATEMENT BY W. P. CATER

Mr. Chairman and members of the committee, I am W. P. Cater, of Cerro, Taos County, N. Mex., where I have lived and have been engaged in the farming and ranching business for more than 30 years.

I am a member of the board of directors of the Llano Irrigation Co., of Cerro, N. Mex., and am here today as their duly selected representative to present to you their wholehearted approval of the bill under consideration, and on their behalf to urge its enactment.

I am also a member of the State soil conservation committee. I am chairman of the Taos Soil Conservation District, a former member of the New Mexico Senate, and chairman of the Taos County Economic Development Committee. I mention these past and present connections as evidence that my knowledge of the irrigation situation, and of the economic conditions of Taos County is gained from personal participation in many activities in the past, in an attempt to better the economic condition and raise the standard of living of our people.

My brother and I operate a 7,500-acre ranch of which we irrigate about 500 acres from surface water rights and from wells. We raise cattle, hogs, and grain and hay to feed livestock. We are faced with the same problems as are our neighbors with smaller acreages.

Taos County contains about a million and a half acres, has a population of over 17,000, and lies in a mountainous region with the altitude ranging from 6,800 to 13,000 feet. The irrigated area averages about 7,000 feet in elevation. The growing season is about 100 days, and the average precipitation is 14 inches. The irrigated farms are small ranging in size from 2 acres to about 50 acres but there are a few farms with irrigated acreage up to 320.

In my area around Cerro in the northern part of the county, there are three irrigation companies, which are really community ditches owned and operated by the water users and landowners themselves. There are, in these systems, 250 water users who irrigate about 5,000 acres. The population of the area is about 1,800. The quality of the soil is good for the most part and is very productive if given sufficient water. The crops now being raised are mostly grain and hay which is fed to livestock that are grazed in the adjoining mountains in the summer.

The source of water for irrigation of the area is from direct flow rights on the small streams that come down from the nearby mountains. The only storage water is 700 acre-feet in Cabresto Lake, owned jointly by the Llano Irrigation Co., and the Cabresto Lake Irrigation Co. of Questa. Many of these rights date back to the early Spanish settlement of the area. But due to financial inability to construct storage, the surplus floodwaters have been filed on by water users

lower down in the Rio Grande Valley, and it is now impossible to impound the water that is needed in the area for late irrigation. There is always an oversupply of water in the streams in the spring, and usually a severe shortage in the latter part of the growing season. As a consequence, the farmers are forced to raise those crops that will mature early, and this type of crops usually do not have a high cash value. So it is necessary in many instances for the head of the family, and often the oldest son and daughter, to leave their farm for the mother and smaller children to operate, while they seek employment to add to the meager family income in order that they may continue to exist at their present very low standard of living.

The per capita average income for our county is about $650 while for the State as a whole it is about $1,600 against a national average per capita income of $1,920.

You can see that the situation in the area is bad. We believe, therefore, that the San Juan-Chama transmountain diversion, and in our case the Cerro unit of the project proposed by the bill will provide a way to greatly improve the economic condition of our people.

This act would permit construction of storage in our streams so that we could hold back the heavy spring runoff and use it for irrigation in the late part of our growing season. The water so stored would be replaced in the Rio Grande for existing rights lower down, by water brought over from the Colorado River through the Chama River. This increased storage of water in our area would permit our people to grow commercial vegetables and similar crops having a high cash value and thereby greatly relieve the present economic distress. This type of farming also requires a considerable amount of hard labor, and would furnish employment locally so that the people would not need to go away from the area to seek employment elsewhere.

We also believe that the construction of this project as set out under the present bill would, by rebuilding the present irrigation systems with good structures and better ditch grades, provide for a much more efficient use of the water, and a much greater degree of conservation of both soil and water.

I believe that the construction of the San Juan-Chama transmountain diversion project and the Cerro unit, would permit storage of water in our area during the heavy spring runoff and assure us of sufficient water to properly irrigate the present acreage throughout the entire growing season. And that it would, through additional storage and more efficient management of the water, permit putting into production from 7,000 to 8,000 acres of new land that is now in sagebrush.

The assurance of sufficient water throughout the growing season would stop the present practice of excessive application of water early in the season, with the resultant leaching and loss of soil fertility. This would mean higher yields and better quality and thereby increase the farmer's income.

A more diversified type of farming would be possible under this project than is possible under existing conditions. Our area, because of the fact that we have practically no commercial industries, is economically in a very bad way, and we believe that the project provided for by this bill would be a big shot in the arm in our area. And so, I urge your favorable consideration for the measure you have before you which provides for the San Juan-Chama transmountain diversion.

I thank you for your courtesy and the opportunity to appear before you in behalf of this bill.

STATEMENT BY ANDRES A. MARTINEZ

Mr. Chairman and members of the committee, my name is Andres A. Martinez. I own and operate a small 70-acre irrigated dairy farm in the Taos Valley of Taos County, N. Mex. I was selected by the water users of this area to represent them on behalf of the San Juan-Chama transmountain diversion project. I am here to present, on their behalf, their support of the bill being considered here today and to urge your favorable consideration.

If you will permit me a personal reference—I will state that I am a water user under the Acequia del Monte, a small community ditch system near Taos. I am also a member of the county agricultural stabilization committee, a member of the board of directors of the county farm and livestock bureau, and a cooperator of the Taos Soil Conservation District and also of the agriculture college and the county extension services.

I make my living entirely from my farming operations.

I mention these activities to show, in a measure, that I am acquainted with the agricultural and irrigation conditions of the area I represent.

To assist you in considering this bill, I wish to present the following information:

Taos County is situated in the north-central part of New Mexico. It has a population of 17,146 according to the 1950 census. It covers an area roughly 78 miles long and 38 miles wide containing 1,443,840 acres. Of this acreage about one half is privately owned land and most of the other half is owned by the Federal Government.

Of the privately owned land approximately, 40,000 acres are under irrigation. There are 1,200 irrigated farms ranging from 2 to 50 acres but a few farms with acreages up to 320. Irrigation is by direct diversion from the numerous streams that flow into the Rio Grande from the Sangre de Cristo Mountains.

The climate is typical of big Southwest—low annual precipitation, high evaporation, with a short growing season. Elevations in the district vary from 6,800 to 13,000 feet with the average of the cultivated areas around 7,000 feet. Precipitation in the irrigated areas averages between 13 and 16 inches. Most of the summer rains come in July and August.

The soils in the irrigated areas are chiefly alluvial soils and highly productive with irrigation.

The area that I represent is in the central part of Taos County. It is one of the oldest settled regions of the United States. In this area there are approximately 14,000 acres under cultivation served by 62 community ditch systems. These ditches divert irrigation water from the numerous streams that flow into the Rio Grande from the Sangre de Cristo Mountains.

Water rights in this area date back to 1740 when the first agreement was reached with regard to the use of water between the Pueblo de Taos Indians and the Spanish Colony of Taos. Various water rights were filed after that date and all water use prior to 1907 was adjudicated under the Rio Grande compact prior to the construction of the Elephant Butte Dam. And this was when our water troubles started.

Studies made indicate that enough water would be available to properly irrigate around 20,000 acres in this area. At present there is not enough water to properly irrigate the present acreage of 14,000 now under cultivation. This is because under provisions of the Rio Grande compact we cannot build storage reservoirs but must deliver it to our neighbors from the lower Rio Grande of New Mexico and Texas.

We have an oversupply of water in the spring but the supply is short during the critical part of the growing season (June–July). This has lead to a practice of applying large amounts of irrigation water in the early part of the season resulting not only in injury to the land and crops but also inefficient use of our water resources.

Under present conditions, heads of farm families depend almost entirely on outside work for a living. However, if all these communities had sufficient irrigation water, the farm families could raise garden crops to can and freeze. We could even sell to local merchants who now ship fresh vegetables from Arizona and California. With plenty of irrigation water, there would be worlds of opportunities for all these people to stay in their lovely valley instead of having to go, sometimes with their entire families, to obtain seasonal labor in other areas. Water is needed. We have the land but where is the water?

We could raise other crops such as beets, potatoes, onions, strawberries, apples, and numerous others in addition to our irrigated pastures, alfalfas, and small grains.

I know what can be done. On one farm north of Taos Valley where there is a continuous supply of water they raise plenty of food for a large family. They have a freezer overflowing with meats, green beans, asparagus, strawberries, raspberries, and more. This family east well and why?Because they have water. Why does this family live in plenty, with a well-rationed diet, and others live on dry pinto beans, powdered chili and potatoes which they buy in the stores? Water is the answer.

The portion of the waters of the San Juan which would be diverted into the Rio Grande would accomplish the following in my area:

1. Permit the storing of irrigation water during the spring flood season.
2. We would be assured of enough water to properly irrigate, throughout the growing season, the acreage now under cultivation.
3. It would reclaim 7,000 acres of potentially productive land now in low-producing sagebrush rangeland.

4. In allowing for storage of water for future use, it would prevent the over use of early surplus water.

5. It would encourage market gardening, and, so in increasing salable output from the farm, the income of the farmer would be increased by a considerable amount.

Mr. Chairman and members of the committee I wish to thank you for the opportunity to appear before you and urge that you give this bill your favorable consideration. Thank you.

Mr. ROGERS. Mr. Ball, we will hear from you, please.

STATEMENT OF HUBERT BALL, CHIEF ENGINEER, MIDDLE RIO GRANDE CONSERVANCY DISTRICT

Mr. BALL. Mr. Chairman, I have a prepared statement that I would like to submit, and request that it be included in the record.

I also have a prepared statement from Mr. Oscar M. Love, who is chairman of the board of directors of the Middle Rio Grande Conservancy District that I represent. I also request that this statement be included in the record.

Mr. ROGERS. Without objection, both statements will be included in the order in which they were offered.

(The statements of Mr. Ball and Mr. Love follow:)

STATEMENT OF HUBERT BALL, CHIEF ENGINEER, MIDDLE RIO GRANDE CONSERVANCY DISTRICT

Mr. Chairman and members of the committee, my name is Hubert Ball, I am chief engineer of the Middle Rio Grande Conservancy District with offices located at 1930 South Second Street, Albuquerque, N. Mex., and I have been instructed to appear here in support of various provisions in the bills being considered by this committee today. My principal interest is, of course, concerned with benefits that might accrue to the middle Rio Grande area and particularly to the district through authorization and construction of the San Juan-Chama transmountain diversion project. However, I have been directly connected with the various groups that are interested in the control and development of water resources for New Mexico and am extremely interested in any proposal that would benefit other areas of the State. I would, therefore, like first to make a general statement regarding other units proposed in the legislation to authorize construction of the Navajo Indian irrigation project and San Juan-Chama transmountain diversion.

I am personally familiar with these proposed projects and I am acquainted with many of the people of those areas. I do not know of any proposed development in the Western States where so much progress and benefits would accrue to the local people through the control and distribution of like amounts of water as are involved in this particular bill. The presence of the great uranium deposits, gas fields and oil supplies, available in the San Juan Basin, lend themselves to a terrific industrial development in the northwestern section of New Mexico, which is, to a large degree, covered by the northeast section of the Navajo Indian lands. These people, with non-Indian inhabitants of the area, are beginning to realize that the local manpower available, plus the adjacent natural resources, gives them an opportunity to develop a great industrial and agricultural section which not only is most locally desirable, but will be demanded by the increasing population of the United States in order to maintain the present standard of living to which we are all accustomed. I have known the people of the area covered in this bill for many years and I believe that the benefits and development you have been shown that will result by reliable witnesses are only the catalyst that is needed to start this great development I believe these people are capable of initiating and carrying out. These communities, and indeed the people of all the State, have lived in anticipation of the development of the Upper Colorado River Basin for many years and it is with great hope and anticipation that they are watching and reading the developments in connection with this project and others authorized in the upper Colorado River area.

I would now like to devote a few minutes to the particular part of the project that would be affected by the San Juan-Chama transmountain diversion

and particularly to the benefits that would accrue to the Middle Rio Grande Conservancy District. The exterior boundaries of the Middle Rio Grande Conservancy District covers an area of approximately 300,000 acres, of which about 120,000 lie within the benefited area and is located along the Rio Grande between White Rock Canyon which is near the northerly boundary of the Cochiti Indian lands and extends a distance of approximately 155 miles in a southerly direction to the Bosque del Apache Wildlife Refuge, which is about 20 miles south of Socorro, N. Mex. The district is responsible for irrigation, drainage, and flood control on the developed areas of six Indian reservations, the towns of Socorro, Belen, Los Lunas, Bernalillo, and numerous small villages and communities intermingled with approximately 98,000 acres of very valuable agricultural lands. A major portion of the residential area and practically all of the main business and industrial sections of Albuquerque are also within the conservancy district and depend on us most particularly for protection from high ground water tables and the possibility of floods from the Rio Grande. The agricultural development and extremely favorable climate has been extremely important in the development of these urban areas and the recordbreaking population increases that has been experienced by the cities and towns within the middle Rio Grande area. This increase in population has, of course, had a direct affect on the amounts of water available for all purposes and since the domestic and industrial water supply, generally, is being secured from the underground basin immediately adjacent to the Rio Grande a decrease in surface flow of the river has been inevitable. These nonagricultural uses in the Albuquerque area alone now exceeds 53,000 acre-feet per year and is over 70,000 acre-feet per year for all of the urban development within the district boundaries. This loss of water to the agricultural development, plus intermittent drought cycles experiences in our area most certainly indicate that the various interests along the Rio Grande in the central part of New Mexico would certainly be amiss in their duty should they fail to use every financial and physical means available to secure the additional water supply that will be made available to the valley through the transmountain diversion.

The total depletion resulting from municipal and industrial development to the flow of the middle Rio Grande is estimated to be over one-half of the 70,000 acre-feet diverted, or something near 35,000 acre-feet per annum. The 55,000 acre-feet in the initial development of the transmountain diversion allocated to the city of Albuquerque, plus the present use of approximately 30,000 acre-feet, will allow domestic and industrial supplies for a city several times the present size. Many competent economists estimate present local trends indicate that this is not only possible but entirely probable and additional water is a must to preclude the probability of a catastrophe that might be brought about in a decreased water supply available to the agriculturally supported areas and also to eliminate the possibility of the suffering and misery that might result from continued drought in the middle Rio Grande areas to domestic users.

There is allocated about 22,000 acre-feet of water directly to the Middle Rio Grande Conservancy District which would be used to supplement presently available supplies. We believe that the completion of this project, with construction of storage reservoirs proposed, would allow a steady and firm supply of water for agricultural use that would induce our farmers to devote more land and time to the growing of vegetables, fruit, and other similar productive crops. This type of agriculture required smaller but more sustained irrigation supplies than are now available throughout the valley.

The present types of crops now being produced are generally small grain, alfalfa, corn, and cotton, with a very limited amount of fruit and vegetables. These types of crops are generally those which are surplus in the country and we wish to particularly point out that such a change in the crop pattern in our area would delete from rather than augment the over abundance of field crops which are now such a financial problem to the Government economy and the well-being of our agricultural communities.

We wish to also emphasize that the probable growth of population would certainly be able to consume locally the additional vegetables, fruit, and dairy supplies thus made available rather than be in competition to other similar crop-growing areas. We believe that this is a most important point, since other hearings on proposed irrigation projects invariably bring up this question of crop surplusage. We would further emphasize the probability of a change in this agricultural pattern due to the size of the average farm within the district. There are not more than a dozen farms of family ownership in the valley which exceed 160 acres and several of these are in areas where suburban development

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within the next few years is inevitable. Ninety percent of the lands of the Middle Rio Grande Conservancy District are held by individual owners in tracts of less than 20 acres. This type of small homesite development readily lends itself to the growing of types of crops which must be intensely cultivated. I am informed by the county agents of the various counties within the district that this conclusion is entirely correct and that they will support this conclusion with any figures or statements which might be required.

Important among the many problems which are always arising at hearings for authorization of irrigation projects concern the matter of financing, construction, operation, and maintenance. We are assured that the water allocated for municipal and industrial use will be paid for by various municipalities and that they expect to pay interest as well as principal on that part determined to be properly chargeable to this portion of the project. The Middle Rio Grande Conservancy District certainly expects to pay its proper share for that portion of the construction, operation, and maintenance cost, which is allocated to the district for repayment to the Government for our allocated portion of the available water. There are several other small irrigation projects for which supplemental and additional water supplies are allocated particularly along tributary areas north of the Middle Rio Grande Conservancy District which are also represented here by witnesses who will testify in their behalf. We concur fully in their statements and also those of other proponents of the proposed project which you have heard and will hear. We join them in urging that this project be fully authorized and that all haste be made in the construction so that the benefits we are sure will be realized can be ready in time to take care of the need which we feel the increased population of our State and community will require by the time these proposed works could possibly reach a usable state of completion.

Thank you very much for your kindness and consideration.

STATEMENT OF OSCAR M. LOVE, ALBUQUERQUE, N. MEX.

Mr. Chairman and members of the committee, my name is Oscar M. Love and my address is 814 Morningside Avenue S.E., Albuquerque, N. Mex. I am a former member of the Interstates Streams Commission of the State of New Mexico, president of the Middle Rio Grande Conservancy District, and executive vice president of the Albuquerque National Bank. My association with these and other similar organizations, for three decades, has permitted me to acquire considerable information and knowledge of economic and financial conditions existing in the northwestern section of our State, which is the portion most particularly affected by the legislation to authorize construction of the Navajo Indian irrigation project and San Juan-Chama transmountain diversion, which your committee has under consideration at this time.

The State of New Mexico was allocated approximately 838,000 acre-feet by the upper Colorado River compact and the present bill would authorize construction of certain projects which would permit the State to put to beneficial use their portion of the water of the San Juan River as allocated under the compact. These units are better known as the Navajo Indian irrigation project and the San Juan-Chama transmountain diversion. They are very essential and would complete New Mexico's program for utilization of their share of the Colorado water and allow full use of the Navajo Dam which is now under construction as authorized by previous congressional action. It is expected that the Navajo Dam project will cost approximately $40 million and that the completed units outlined in the legislation to authorize construction of the Navajo Indian irrigation project and San Juan-Chama transmountain diversion will cost not to exceed $208 million. These projects have been investigated thoroughly, and detailed reports prepared by various governmental units show that these projects are justified from an economic standpoint and that the beneficial cost ratio is sufficient to justify favorable consideration of the Congress.

Certainly these projects would be of great benefit to the entire State, however, I feel that it is in order for me to submit a few facts regarding the northwest portion of the State which would be most directly and particularly affected through the authorization and construction of those units of the overall project which are now being considered.

The Navajo Indians have endured many years of hardships due to the large population and the lack of favorable agricultural areas and although they have received some funds from recent programs involving production of various minerals, I believe firmly that their future welfare and well-being depend on additional help and assistance which can be given through the development of agricultural and industrial programs which will be greatly implemented by the construction and development of the Navajo Dam and related irrigation projects.

The San Juan-Chama transmountain diversion initial stage involves the transportation of approximately 110,000 acre-feet of water into the middle Rio Grande Valley from the upper tributaries of the San Juan River in southern Colorado and northern New Mexico. There are 10 counties in this section of the State which would be directly benefited. The past records of population and resources in these counties indicate that there is a substantial growth and development. However, close examination of the reports made by the Bureau of Reclamation, and my personal knowledge of economic and physical conditions within this immediate area, lead me to believe that a point in their development has been reached where further progress will be greatly impeded or come to a complete stop until such time as there is additional water made available. The total population of these counties in 1940 was 230,418, as compared to a total estimated population in 1958 of 467,500 people. This is an increase of 103 percent in 18 years and the population of this area has grown from less than one-half that of the total population of the State to 69 percent of the total as now presently estimated. The total State population in 1940 was 531,818 and at the present time is estimated to be 681,187. The total estimated income for all farm produce in these counties in 1957 was approximately $9 million. The total income from other sources for the same period of time was estimated to be approximately $650 million. This indicates that while the water allocated for use by the various agricultural areas is very important, the water also allocated to the municipalities and industrial areas is of prime importance. I suggest that this condition is brought about by the extremely favorable climatic conditions for the development of industry and also because of the availability at nearby locations of extremely important natural resources. The major natural resources are in the petroleum and uranium fields and when combined with the availability of sufficient water encourages a continued growth of industry which we believe is essential under our present terrific increase in population throughout the country and particularly in the Upper Colorado River Basin area.

I wish particularly to urge the favorable consideration of this project, also because of the help and aid it would allow various small communities through a guaranteed annual water supply which would permit the middle Rio Grande area to change its type of crops from those of small grains and hay into those of vegetables, fruits, and similar produce. A major portion of the vegetables and fruits consumed locally are shipped into our area from very distant points and the problem of conserving them for long periods of time and their transportation costs means that local citizens pay a premium for all fresh produce. We are reliably informed that the increase in population, following the construction of this project, would allow all of this type of agricultural production to be consumed locally and would not in any way interfere or detract from the other similar producing areas which have already been intensively developed. A list of the 10 counties previously referred to with the figures as quoted is attached hereto.

I will not attempt to go into technical explanations of the project or any of its units because I am sure that reports of the various governmental agencies, with the testimony as submitted by their representatives and other able witnesses, will certainly answer any questions the committee may have in mind at this time. I will be very glad to attempt to answer any questions the com-

mittee might have, which I would be qualified to answer through my long residence in this area, with particular reference to economic and physical conditions that I have had the privilege of becoming familiar with through my association with various civic and private institutions through the years I have resided in this area.

Thank you for this opportunity to appear here today.

Population by counties

Counties	1958	1940	Farm income 1956	Total income
Bernalillo	235,000	69,391	$1,967,000	$389,751,000
Los Alamos	13,200		0	39,845,000
McKinley	38,500	23,641	390,000	31,093,000
Rio Arriba	25,500	25,352	811,000	14,071,000
Sandoval	11,600	13,898	371,000	4,993,000
San Juan	51,200	17,115	1,070,000	67,366,000
Santa Fe	41,500	30,826	733,000	57,257,000
Socorro	9,900	11,422	1,074,000	9,407,000
Taos	15,000	18,528	379,000	9,266,000
Valencia	26,100	20,245	2,152,000	27,032,000
Total 10 counties	467,500	230,418	8,947,000	650,081,000
Total State—New Mexico	681,187	531,818		

NOTE.—The 1958 population of the 10 counties reflects an increase of 103 percent over 1940; the above 10 counties equal 69 percent of total State population.

Mr. BALL. I would like to emphasize one or two points in my statement, a matter which you discussed with Mr. Engel regarding the payment. The Middle Rio Grande Conservancy District is prepared at this time to pay any reasonable or equitable amount of the cost of the San Juan-Chama which is apportioned to us. We would be willing to start tomorrow to pay for our share of it.

I might say we are now engaged in a Bureau of Reclamation project, they started construction in 1955 and we will be completed in 1961, and before that time we have already paid off approximately 30 percent of the final cost. We are ready to pay our share.

Mr. ROGERS. Did you have any questions, Mr. Saund?

Mr. SAUND. No questions.

Mr. ROGERS. Mr. Morris?

Mr. MORRIS. No questions.

Mr. ROGERS. Thank you, Mr. Murphy and Mr. Ball, for your presentations.

The next witness is Felix L. Sparks, director, Colorado Water Conservation Board, Denver, Colo.

STATEMENT OF FELIX L. SPARKS, DIRECTOR, COLORADO WATER CONSERVATION BOARD, DENVER, COLO.

Mr. SPARKS. Mr. Chairman and members of the committee, my name is Felix L. Sparks and I appear here as the director of the Colorado Water Conservation Board, an official agency of the State of Colorado. I am also the Governor's designated representative under the 1944 Flood Control Act for coordination of planning reports on water resources development, involving waters which have their origin in whole or in part within the State of Colorado.

With specific reference to the type and subject matter of the legislation now being considered by this committee, the Legislature of the

State of Colorado has imposed the following duties upon our board, and I quote from our statutes:

> To investigate the plans, purposes, and activities of other States, and of the Federal Government, which might affect the interstate waters of Colorado; and
> To confer with and appear before the officers, representatives, boards, bureaus, committees, commissions, or other agencies of other States, or of the Federal Government, for the purpose of protecting and asserting the authority, interests, and rights of the State of Colorado and its citizens over, in, and to the waters of the interstate streams in this State.

In response to these statutory duties we began several years ago, and have continued to this date, a thorough and exhaustive engineering and legal analysis of effects of the proposed Navajo irrigation and San Juan-Chama projects on the water supply of the State of Colorado. This study was particularly prompted by the fact that virtually all of the San Juan Basin water originates in Colorado, and is the sole source of supply for that sizable portion of the basin which lies within our State.

There has been considerable testimony concerning the Navajo Indian tribal lands, rightly so in this case. I would like to observe that a large portion of the San Juan Basin in Colorado is occupied by two Indian reservations, the Ute Mountain Tribal Reservation and the Southern Ute Tribal Reservation. All our projects in that area contemplate, in part, delivery of water to those two tribal reservations.

The average annual virgin flow of the San Juan River originating in Colorado and New Mexico is 2,256,000 acre-feet. Our recently completed studies indicate that the maximum streamflow depletion in Colorado in the foreseeable future will not exceed 300,000 acre-feet per annum. The maximum depletion to which the State of New Mexico is entitled in perpetuity under the terms of the Colorado River compact and the upper Colorado River Basin compact is 838,125 acre-feet of water annually. The combined use of both States, therefore, in the foreseeable future, could amount to only about 50 percent of the total streamflow. When viewed in the light of the Colorado River compact, it is doubtful that even this 50-percent use will ever be attained.

Average streamflows, however, are dangerously misleading. We have, therefore, carefully reconstructed the operation of Navajo Reservoir and the San Juan-Chama project on a day-to-day, month-to-month, and year-to-year basis upon the framework of historic conditions during a period of adverse streamflow, 1943–56.

The streamflow of that period was only 70 percent of the historic streamflow. This reconstructed operation was correlated with the assumption of optimum water uses in the State of Colorado. The results convincingly demonstrate that the proposed New Mexico development will fall far short of imposing any demand on water uses in the San Juan Basin within Colorado, either present or contemplated, including the proposed Animas-La Plata project in Colorado.

Our studies have been based upon certain assumptions concerning the operational aspects of the New Mexico projects now under consideration. In order that these assumptions be firmly established, we have negotiated at length with the State of New Mexico to the end that the pending legislation be more explicit as to the method of project operation. I am pleased to say here that an agreement has been

reached between our two States in the form of amendments to the bills now before this committee. These amendments have been approved by the Governors of the two States, and by the respective responsible State agencies, to wit, the Colorado Water Conservation Board and the New Mexico Interstate Streams Commission. I must add, however, that the approval of the State of Colorado is predicated upon a finding by the Secretary of the Interior that the operation of the New Mexico projects will not adversely affect the water supply of the proposed Animas-La Plata project in Colorado and New Mexico. From our own studies we have concluded that it is highly improbable that the Secretary could make any finding to the contrary. I ask the indulgence of this committee in submitting as a part of this statement a reproduction of H.R. 2352 setting forth the proposed amendments, and bearing the heading "Colorado Water Conservation Board, May 11, 1960."

I shall not dwell at any length upon the proposed amendments since they are, for the most part, self-explanatory. I do wish to emphasize for the record, however, that our operational studies were in the first and final instance premised upon the assumption that the Secretary of the Interior would operate Navajo Reservoir for one of the primary purposes for which it was authorized, that is, for the regulation of the San Juan River for the benefit of all the upper basin States. This means to us that in any year in which New Mexico has water available or it can be reasonably anticipated that water will be available for its full allocation under the terms of the upper Colorado River Basin compact, from any and all sources, then Navajo Reservoir must be operated to release either stored water or stream inflow to satisfy New Mexico uses from or below the reservoir. In referring to New Mexico uses, we are speaking of those uses which, without the existence of Navajo Reservoir, might constitute a legal demand against the State of Colorado for the release of natural streamflow. This means in essence that there will be times when the Secretary must release water from or through Navajo Reservoir, irrespective of actual contractual obligations entered into pursuant to the legislation here under consideration.

In further explanation of the foregoing, it is our interpretation of the upper basin compact, when considered in light of the Colorado River compact, that New Mexico's depletion allocation must be based upon an average annual depletion computed from any period of 10 consecutive years reckoned in continuing progressive series. This compact interpretation, along with the assumed operation of Navajo Reservoir before described, is an integral part of the agreement arrived at between the States of Colorado and New Mexico as it pertains to H.R. 2352.

Actually, we consider these amendments more than adequate to insure the operation of Navajo Reservoir and the San Juan-Chama project in conformity with our study assumptions. This view may not be shared by everyone in Colorado. As a matter of fact, unanimous agreement on water resource projects anywhere is about as likely as Khrushchev welcoming further reconnaissance flights over Russia. Nevertheless, we have patiently explored every objection at a great expenditure of both time and money. We have concluded that any objections to the proposed legislation, as amended, based upon injury to Colorado, have no foundation in fact, and by no logic should be the basis for destroy-

ing or delaying the development of the water resources of the State of New Mexico.

More than our concern for New Mexico, however, is the fact that the operation of Navajo Reservoir will confer a considerable benefit upon water users in Colorado. In Navajo Reservoir can be stored the floodflows of the San Juan River. Such flows exist every year in varying degrees of magnitude. By the utilization of these surplus flows in New Mexico, future demands against the State of Colorado for the sharing of direct streamflow will be materially reduced. Indeed, the only possible way to permit the maximum use of San Juan River waters in both Colorado and New Mexico is through the operation of a structure such as Navajo Dam.

In addition to the foregoing statements, it is our position that the State of New Mexico is entitled to the water guaranteed to it by the upper Colorado River Basin compact, even though the water may originate entirely in Colorado. We are also fully convinced that the projects here under consideration are justifiably necessary to the expanding economy of New Mexico. We therefore respectfully urge this committee to pass favorably upon the pending legislation with the amendments herein proposed, to authorize the Secretary of the Interior to construct, operate, and maintain the Navajo irrigation and San Juan-Chama projects in the State of New Mexico.

Mr. Chairman, there is attached hereto our proposed amendments.

Mr. ROGERS. Mr. Sparks, is that the item you refer to on page 4 of your statement?

Mr. SPARKS. That is correct, Mr. Chairman.

Mr. ROGERS. Without objection, it will be included as part of your statement. I presume you wanted it so included.

Mr. SPARKS. Yes.

Mr. ROGERS. Without objection, it will be included as part of your statement.

(The document referred to follows:)

COLORADO WATER CONSERVATION BOARD,
Denver, Colo., May 11, 1960.

It is proposed by the Colorado Water Conservation Board that S. 72 and H.R. 2352, 1st session, 86th Congress, be amended as follows (all amendments are shown in italic letters):

A BILL

To authorize the Secretary of the Interior to construct, operate, and maintain the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as participating projects of the Colorado River storage project, 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 purposes of furnishing water for irrigation [or] *of* irrigable and arable lands, municipal, domestic and industrial uses (and for other beneficial purposes), providing recreation and fish and wildlife benefits, controlling silt, the Congress hereby approves as participating projects of the Colorado River storage project the Navajo Indian irrigation project, New Mexico, and the *initial stage of the* San Juan-Chama project, Clorado-New [Mexico.] *Mexico, as conditioned, modified, and limited herein.* Principal engineering works of the Navajo Indian irrigation project shall be a main gravity canal, tunnels, siphons, pumps, and powerplants for project purposes, laterals, drains, distribution systems and related works. The *initial stage of the* San Juan-Chama project facilities shall be comprised principally of regulating and storage reservoirs, collection, diversion and conveyance systems, and associated works.

The Navajo Indian irrigation project and the *initial stage of the* San Juan-Chama project herein approved are substantially those described in the proposed coordinated report of the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, approved and adopted by the Secretary of Interior on October 16, 1957[.], *as conditioned, modified, and limited herein.*

SEC. 2. Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain the Navajo Indian irrigation project for the principal purpose of furnishing irrigation water to approximately one hundred and ten thousand six hundred and thirty acres of land, said project to have an average annual diversion of five hundred and eight thousand acre-feet of water, the repayment of the costs of construction thereof to be in accordance with the provisions of said Act of April 11, 1956 (70 Stat. 105), including, but not limited to, section 4(d) thereof.

SEC. 3. (a) In order to provide for the most economical development of the Navajo irrigation project, the Secretary of the Interior is hereby authorized and directed to declare by publication in the Federal Register that the United States of America holds in trust for the Navajo Tribe of Indians any legal subdivisions or unsurveyed tracts of federally owned land outside the present boundary of the Navajo Indian Reservation in New Mexico in townships 28 and 29 north, ranges 10 and 11 west, and townships 27 and 28 north, ranges 12 and 13 west, New Mexico principal meridian, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project: *Provided, however,* That no such legal subdivision or unsurveyed tract shall be so declared to be held in trust by the United States for the Navajo Tribe until the Navajo Tribe shall have paid the United States the full appraised value thereof: *And provided further,* That in making appraisals of such lands the Secretary of the Interior shall consider their values as of the date of approval of this Act, excluding therefrom the value of minerals subject to leasing under the Act of February 25, 1920, as amended (30 U.S.C. 181–286), and such leasable minerals shall not be held in trust for the Navajo Tribe and shall continue to be subject to leasing under the Act of February 25, 1920, as amended, after the lands containing them have been declared to be held in trust by the United States for the Navajo Tribe.

(b) The Navajo Tribe is hereby authorized to convey to the United States, and the Secretary of the Interior is hereby directed to accept on behalf of the United States, title to any land or interest in land within the above-described townships, susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project, acquired in fee simple by the Navajo Tribe, and after such conveyance said land or interest in land shall be held in trust by the United States for the Navajo Tribe as a part of the Navajo Indian irrigation project.

(c) The Secretary of the Interior is hereby authorized and directed to acquire by purchase, exchange, or condemnation any other land or interest in land within the townships above described susceptible to irrigation as part of the Navajo Indian irrigation project or necessary for location of any of the works or canals of such project. After such acquisition, said lands or interest in lands shall be held by the United States in trust for the Navajo Tribe of Indians and the price of such lands or interest in lands or of the land given in exchange therefor by the United States shall be charged to funds of the Navajo Tribe of Indians on deposit in the Treasury of the United States.

SEC. 4. In developing the Navajo Indian irrigation project, the Secretary is authorized to provide capacity for municipal and industrial water supplies or miscellaneous purposes over and above the diversion requirements for irrigation stated in section 2 of this Act. But such additional capacity shall not be constructed and no appropriation of funds for such construction shall be made unless, prior thereto, contracts have been executed which, in the judgment of the Secretary, provide satisfactory assurance of repayment of all costs properly allocated to the purposes aforesaid with interest as provided by law.

SEC. 5. Payment of operation and maintenance charges of the irrigation features of the Navajo Indian irrigation project shall be in accordance with the provisions of the Act of August 1, 1914 (38 Stat. 582, 583), as amended by the Act of August 7, 1946 (60 Stat. 867) : *Provided,* That the Secretary of the Interior in his discretion may transfer to the Navajo Tribe of Indians the care, operation, and maintenance of all or any part of the Navajo Indian irrigation project works, subject to such rules and regulations as he may prescribe, and, in such event, the Secretary may transfer to the Navajo Tribe title to movable property necessary to the operation and maintenance of project works.

SEC. 6. [(a)] Pursuant to the provisions of the Act of April 11, 1956 (70 Stat. 105), the Secretary of the Interior is authorized to construct, operate, and maintain [an] the initial stage of the San Juan-Chama project, Colorado-New Mexico, for the principal purposes of furnishing water supplies to approximately thirty-nine thousand three hundred acres of land in Cerro, Taos, Llano, and Pojoaque tributary irrigation units in the Rio Grande Basin, about eighty-one thousand six hundred acres of land in the existing Middle Rio Grande Conservancy District, and municipal, domestic, and industrial uses, and providing recreation and fish and wildlife [benefits, said initial stage to have an average annual diversion of one hundred and ten thousand acre-feet of water.] *benefits. Said construction and operation of the diversion facilities of the initial stage authorized herein shall include only natural flow of the Navajo, Little Navajo, and Blanco Rivers in Colorado as set forth in the supplemental project report dated May 1957.* Principal engineering works of the initial stage development involving three major elements, shall include diversion dams and conduits, storage and regulation facilities at the Heron Numbered 4 Reservoir site and enlargement of outlet works of the existing El Vado Dam, and water use facilities consisting of reservoirs, dams, canals, lateral and drainage systems, and associated works and appurtenances. The construction of recreation facilities at the Nambe Reservoir shall be contingent upon the Secretary's making appropriate arrangements with the governing body of the Nambe Pueblo for the operation and maintenance of such facilities, and the construction of recreation facilities at the Heron Numbered 4, Valdez, and Indian Camp Reservoirs and shall be contingent upon the Secretary's making appropriate arrangements with a State or local agency or organization for the operation and maintenance of those facilities: *Provided,* That—

(a) The Secretary of the Interior shall so operate the initial stage of the project authorized herein that diversions to the Rio Grande Valley shall not exceed one million, three hundred and fifty thousand acre-feet of water in any period of ten consecutive years, reckoned in continuing progressive series starting with the first day of October after the project shall have commenced operation.

(b) The Secretary of the Interior shall operate the project so that there shall be no injury, impairment, or depletion of existing or future beneficial uses of water within the State of Colorado the use of which is within the apportionment made to the State of Colorado by article III of the Upper Colorado River Basin compact, as provided by article IX of the Upper Colorado River Basin compact and article IX of the Rio Grande compact.

[(i)] *(c)* All works of the project [, both in its initial stage and in its final development,] shall be constructed so as to permit compliance physically with all provisions of the Rio Grande compact, and all such works shall be operated at all times in conformity with the Rio Grande compact.

[(ii)] *(d)* The amount of water diverted in the Rio Grande Basin for users served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year.

[(iii)] *(e)* Details of project operation essential to the accounting of diverted San Juan and Rio Grande flows shall be cooperatively developed through the joint efforts of the Rio Grande Compact Commission, the appropriate agencies of the United States and of the States of Colorado, New Mexico, and Texas, and the various project entities. In this connection the States of Texas and New Mexico shall agree, within a reasonable time, on a system of gaging devices and measurements to secure data necessary to determine the present effects of tributary irrigation, as well as present river channel losses: *Provided,* That if the State of Texas shall require, as a precedent to such agreement, gaging devices and measurements in addition to or different from those considered by the Department of the Interior and the State of New Mexico to be necessary to this determination, the State of Texas shall pay one-half of all costs of constructing and operating such additional or different devices and making such additional or different measurements which are not borne by the United States. The results of the action required by this subsection shall be incorporated in a written report transmitted to the States of Colorado, Texas, and New Mexico for comment in the manner provided in the Flood Control Act of 1944, before any appropriation shall be made for project construction.

(f) The Secretary of the Interior shall operate the project so that for the preservation of fish and aquatic life the flow of the Navajo River and the flow of the Blanco River shall not be depleted at the project diversion points below

the values set forth at page D2-7 of appendix D on the United States Bureau of Reclamation entitled "San Juan-Chama Project, Colorado-New Mexico", dated November 1955.

(b) *(g)* The Secretary of the Interior is hereby authorized to construct the tunnel and conduit works of the initial stage of the San Juan-Chama project with sufficient capacity for future diversion of an average of two hundred and thirty-five thousand acre-feet per annum, and to recognize the cost of providing such additional capacity as a deferred obligation to be paid at such time as the additional capacity may be required[.]*: Provided, however, That nothing contained in this act shall be construed as committing the Congress of the United States to future authorization of any additional stage of the San Juan-Chama project.*

SEC. 7. (a) No person shall have or be entitled to have the use for any purpose, including uses under the Navajo Indian irrigation project and [the initial stage of] the San Juan-Chama project authorized by sections 2 and 6[(a)] of this Act, of water stored in Navajo Reservoir or of any other waters of the San Juan River and its tributaries originating above Navajo Reservoir to the use of which the United States is [entitled] *entitled, under these projects,* except under contract satisfactory to the Secretary of the Interior and conforming to the provisions of this Act. Such contracts, which, in the case of water for Indian uses, shall be executed with the Navajo Tribe, shall make provisions, in any year in which the Secretary anticipates a shortage taking into account both prospective runoff originating above Navajo Reservoir and the available water in storage in Navajo Reservoir, for a sharing of the available water in the following manner: The prospective runoff shall be apportioned between the contractors diverting above and those diverting at or below Navajo Reservoir in the proportion that the total normal diversion requirement of each group bears to the total of all normal diversion requirements. In the case of contractors diverting above Navajo Reservoir, each such contract shall provide for a sharing of the runoff apportioned to said group in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements of all such contracts that have been made hereunder: *Provided,* That for any year in which the foregoing sharing procedure either would apportion to any contractor diverting above Navajo Reservoir an amount in excess of the runoff anticipated to be physically available at the point of his diversion, or would result in no water being available to one or more such contractors, the runoff apportioned to said group shall be reapportioned as near as may be among the contractors diverting above Navajo Reservoir in the proportion that the normal diversion requirements of each bears to the total normal diversion requirements of the group. In the case of contractors diverting from or below Navajo Reservoir, each such contract shall provide for a sharing of the remaining runoff together with the available storage in the same proportion as the normal diversion requirement under said contract bears to the total normal diversion requirements under all such contracts that have been made hereunder.

The Secretary shall not enter into contracts beyond a total amount of water that, in his judgment, in the event of shortage will result in a reasonable amount being available for the diversion requirements for the Navajo Indian irrigation project and the initial stage of the San Juan-Chama project as specified in sections 2 and 6[(a)] of this Act.

(b) In the event contracts are entered into for delivery from storage in Navajo Reservoir of water not covered by subsection (a) of this section, such contracts shall be subject to the same provision for sharing of available water supply in the event of shortage as in the case of contracts required to be made pursuant to subparagraph (a) of this section.

(c) This section shall not be applicable to the water requirements of the existing Fruitland, Hogback, Cudai, and Cambridge Indian irrigation projects, nor to the water required in connection with the extension of the irrigated acreages of the Fruitland and Hogback Indian irrigation projects in a total amount of approximately eleven thousand acres.

SEC. 8. (a) None of the project works, or structures authorized by this Act shall be operated by the Secretary of the Interior so as to create, implement, or satisfy any preferential right in the United States or any Indian tribe to the waters impounded, diverted, or used by means of such project works or structures, other than contained in those rights to the uses of water granted to the States of New Mexico or Arizona pursuant to the provisions of the Upper Colorado River Basin compact.

(b) The Secretary of the Interior shall operate the projects authorized by this Act so that no waters shall be diverted or used by means of the project works, which, together with all other waters used in or diverted from the San Juan River Basin in New Mexico, will exceed the water available to the States of New Mexico and Arizona under the allocation contained in article III of the Upper Colorado River Basin compact for any water year.

[Sec. 8.] *Sec. 9.* Section 12 of the Act of April 11, 1956, 70 Stat. 105, shall not apply to the works authorized by this Act. There are hereby authorized to be appropriated out of any moneys in the Treasury not otherwise appropriated, such funds as may be required to carry out the purposes of this Act, but not to exceed $221,000,000 (January 1958 prices) plus such amounts, if any, as may be required by reason of changes in construction costs as indicated by engineering cost indexes applicable to the types of construction involved therein and, in addition thereto, such sums as may be required to operate and maintain the projects.

[Sec. 9.] *Sec. 10.* The Act of April 11, 1956 (70 Stat. 105) is hereby amended as follows: (i) In section 1, subsection (2), after "Central Utah (initial phase)", delete the colon and insert in lieu thereof a comma; (ii) in section 5, subsection (e) in the phrase "herein or hereinafter authorized" delete the word "hereinafter" and insert in lieu thereof the word "hereafter"; (iii) in section 7 in the phrase "and any contract lawfully entered unto under said compacts and Acts" delete the word "unto" and insert in lieu thereof the word "into".

Mr. ROGERS. Mr. Aspinall, do you have any questions?

Mr. ASPINALL. I am glad to welcome my personal friend, former fellow western slope resident, former supreme court justice of Colorado, presently executive director of the Colorado Water Conservation Board, before the committee. I commend him upon the fine job he is doing in the interest of Colorado and the upper basin States and the West generally on water matters.

As I understand it, Mr. Sparks, you speak here the official position of the State of Colorado.

Mr. SPARKS. That is right, Mr. Aspinall.

Mr. ASPINALL. That position has been affirmed by an understanding, an agreement with thhe State of New Mexico?

Mr. SPARKS. That is correct.

Mr. ASPINALL. Until there is a change, this agreement as far as the authorities of Colorado stands for Colorado?

Mr. SPARKS. That is entirely correct.

Mr. Aspinall. You speak about further studies that will be necessary in the southwestern Colorado area and northwestern New Mexico area to determine the equities between the users in the two States. As I understand it, further studies are necessary; is that correct?

Mr. SPARKS. We think there must be a definite finding by the Secretary of the Interior that these two proposed projects will not adversely affect the water supply of the proposed Animas-La Plata project.

Mr. ASPINALL. Am I right in my thinking that perhaps some of the difficulty that exists at the present time between Colorado users on the Animas and La Plata with those users in northwestern New Mexico may originate because of studies, perhaps not complete studies, already made by the Bureau of Reclamation?

Mr. SPARKS. That is where the trouble originated. The studies were not complete enough to satisfy potential or actual objections in southwest Colorado.

Mr. ASPINALL. Do you have an understanding with the Bureau of Reclamation that these studies will be made in the near future so that final judgment can be made upon the meaning of such studies?

Mr. SPARKS. The Bureau of Reclamation has agreed to attempt to complete their studies within the next fiscal year. To that end, the State of Colorado is contributing a considerable amount of money.

Mr. ASPINALL. Do I understand correctly that it is the position of the spokesman for Colorado that even at the present time, with the information which you have, there will not be any injury to the future users on the Animas-La Plata project?

Mr. SPARKS. We have had this matter under intensive study for a period of almost 3 years and have expended or will have expended by the end of this fiscal year a sum of almost a hundred thousand dollars of State money.

We have concluded on the basis of our studies that no possible injury could accrue to water users in Colorado as a result of the projects here under contemplation.

Mr. ASPINALL. Has Colorado officially sent to New Mexico its position on the San Juan-Chama-Navajo project?

Mr. SPARKS. The State of Colorado has.

Mr. ASPINALL. There are some States that have not as yet; is that correct, or do you know?

Mr. SPARKS. I believe all of the comments are actually in.

Mr. ASPINALL. I think that is all.

Mr. ROGERS. Mr. Chenoweth?

Mr. CHENOWETH. I have no questions. I am happy to see Mr. Sparks before our committee. He is always a most helpful witness.

Mr. ROGERS. Mr. Saund?

Mr. SAUND. Mr. Sparks, in your statement you say, "This view may not be shared by everyone in Colorado." I am confused about that in view of your answers to the questions from the chairman of the full committee.

Mr. SPARKS. In answer to the question of the gentleman from California, I can never recall any instance in which in Colorado or possibly any other State we have ever had every person agree on every item. I do not think it is true in California. I know it is not true in Colorado.

Mr. SAUND. What did you have in mind when you said that? Has something happened that led you to make that statement?

Mr. SPARKS. Something in the past; I am not sure it exists now. Yes, at the beginning when we instituted studies, there was considerable doubt as to whether or not these projects would have any adverse effect upon Colorado.

Mr. SAUND. I was surprised in reading the statement to see that.

Mr. SPARKS. I share those views.

Mr. SAUND. I am satisfied that you have stated it correctly.

That is all I have.

Mr. ROGERS. Mr. Morris?

Mr. MORRIS. I want to commend Mr. Sparks for his very fine statement. I am happy to see him here today. I think he has made an excellent contribution toward the progress of this legislation.

Mr. SPARKS. Thank you, sir.

Mr. ROGERS. Mr. Sparks, let me say this: If you are doing as well in taking care of Colorado in Colorado as the chairman of the full committee is taking care of Colorado in Washington you will be in excellent shape from now on.

Mr. SPARKS. My job is much easier because of the Congressmen we have from Colorado. We are very fortunate in Colorado to have two of our representatives on this committee.

Mr. ROGERS. We are all happy to be on the same committee with them.

Thank you very much, Mr. Sparks.

Mr. ROGERS. We have now Mr. John L. Gregg, treasurer-manager, Elephant Butte Irrigation District, Las Cruces, N. Mex.

Mr. Gregg, did you want to insert this in the record and then comment on it?

Mr. GREGG. I would prefer to read it if you have the time, sir.

Mr. ROGERS. All right, Mr. Gregg. You may proceed.

STATEMENT OF JOHN L. GREGG, TREASURER-MANAGER, ELEPHANT BUTTE IRRIGATION DISTRICT, LAS CRUCES, N. MEX.

Mr. GREGG. Mr. Chairman and members of the committee, my name is John L. Gregg and I am the manager of the Elephant Butte Irrigation District, Las Cruces, N. Mex.

This statement is made on behalf of the board of directors of the Elephant Butte Irrigation District relative to the proposed authorization of the San Juan-Chama project as provided in H.R. 2352, H.R. 2494, and S. 72.

The Elephant Butte Irrigation District is located in Dona Ana and Sierra Counties in south-central New Mexico. It obtains its water supply from the Rio Grande and is, therefore, directly concerned with proposed upstream projects that will affect, in any way, the flow of the river and the delivery of water to Elephant Butte Reservoir for use within the district.

The Elephant Butte Irrigation District has consistently opposed the authorization of the San Juan-Chama project because, as the result of long and unsatisfactory experience with upstream river and reservoir operation, the district does not believe that the project can be operated in a manner that will, at all times, confine diversions to imported water and will not result in encroachment upon the flow of the Rio Grande and its tributaries originating within the Rio Grande Basin of New Mexico.

Operation of the San Juan-Chama project will be complicated. Imported water will be mingled with Rio Grande Basin water for delivery at various points along the Rio Grande for municipal and irrigation uses. In addition, storage and diversion works will be provided in four irrigated areas located on tributaries of the Rio Grande north of Santa Fe to enable those areas to make greater use of Rio Grande Basin water. Such increased use is to be compensated for with San Juan-Chama project water delivered into the Rio Grande. The Bureau of Reclamation will operate only the diversion, collection and storage works in the San Juan Basin and at the head of the Chama River in New Mexico. Thereafter, the diversion of water will be in the hands of local organizations, such as municipalities, the Middle Rio Grande Conservancy District, or, perhaps, some special form of operating organization to be created later. Furthermore, the operation of the storage and diversion works on Rio Grande tributaries north of Santa Fe will be in the hands of local organizations.

The principal difficulty in connection with stream and reservoir operation on the Rio Grande and its tributaries north of Elephant Butte in New Mexico is that there is no reliable legal basis for the enforcement of proper operation. The Rio Grande compact, which was intended to govern such operation, is, in effect, inoperative because of a legal technicality that developed during a compact enforcement suit brought several years ago by the State of Texas against the State of New Mexico. Proper upstream operation, therefore, is dependent upon the willingness of local areas to voluntarily conduct their operations so as to make required compact deliveries to downstream areas, or upon the willingness and ability of the State of New Mexico to compel such operation. The record does not indicate that local areas will consistently conduct their operations in the proper manner, or that the State of New Mexico either can, or will, compel them to do so. The Middle Rio Grande Conservancy District, located in central New Mexico, has a long record of operating to suit its own purposes regardless of obligations that the State of New Mexico has assumed for the delivery of water to downstream areas. The State of New Mexico has been unable, or unwilling, to prevent this type of operation. Transfer of operation from the Middle Rio Grande Conservancy District to the Bureau of Reclamation has resulted in a change in attitude and some improvement in operation. However, annual debits, or underdeliveries to downstream areas, have not been eliminated, and an accumulated water debt of half a million acre-feet of water, that has been built up during the past 17 years, has not been materially reduced. The accumulated New Mexico debit at the end of 1959 was only 31,500 acre-feet under the maximum accumulated debit during the 17-year period from 1943 to 1959, inclusive. Recent operations in the middle Rio Grande area have been with the benefit of rehabilitated works and a long-flow channel designed to cut river transportation losses to a minimum. During the past 5 years of operation, from 1955 to 1959 inclusive, total annual debits amounted to 81,300 acre-feet and total annual credits amounted to 83,100 acre-feet. Operation in 1959, under drought conditions, resulted in a debit of 29,200 acre-feet. Apparently the delivery of compact requirements each year, and the payment of accumulated obligations resulting from underdeliveries over a period of years, depends more upon favorable natural runoff conditions than upon improvements in operation. The record indicates that New Mexico will comply with the Rio Grande compact if it is convenient to do so, but not if real economy is required in the use of water above Elephant Butte in order to meet its obligations to downstream areas.

The bearing of this situation upon the proposed San Juan-Chama project is that in view of the type of river and reservoir operation that has prevailed north of Elephant Butte over a period of many years, we do not believe that a complicated project such as the San Juan-Chama project can be consistently operated by local organizations without encroachment upon the regular flow of the Rio Grande. Furthermore, we are reluctantly forced to the conclusion that the State of New Mexico cannot consistently compel proper operation by local organizations. Who is going to supervise the distribution of San Juan water in the Rio Grande Basin and the diversions along the river and in the tributary areas? Local operating organizations will

not police themselves and the State of New Mexico either cannot, or will not, police them.

The San Juan-Chama project will create new and supplemental municipal and agricultural uses for water in the Rio Grande Basin of New Mexico that do not now exist. Under normal water supply conditions, proper distribution and accounting for imported water will require a much better type of operation than has been customary north of Elephant Butte during the past. It will be under occasional drought conditions, that materially reduce San Juan Basin deliveries into the Rio Grande Basin, that the adverse effects of improper operation will become most apparent. The normal complications of San Juan-Chama project operation will be increased by the need to reduce diversions to conform to deliveries of San Juan water. We do not believe that the State of New Mexico will be able to force curtailment of diversions required by the new and supplemental uses that will be created by the San Juan-Chama project. The result will be the unauthorized diversion and use of Rio Grande Basin water at a time when flows are below normal.

Proper accounting for San Juan-Chama project water will be difficult even under the best of conditions. Imported water will be mingled with Rio Grande Basin water and the average annual importation of 110,000 acre-feet will be only a relatively small part of the total volume of water flowing in the Chama and in the Rio Grande. Arbitrary assumptions will have to be made regarding transportation losses between the head of the Chama River and points of diversion along the Rio Grande. Increased diversions in the tributary areas north of Santa Fe will have to be determined and rather arbitrary computations made as to the quantity of San Juan water to be delivered at the mouth of the Chama to compensate therefor. Even under ideal operating conditions, no one can be certain that deliveries will balance diversions. It is a matter of common knowledge that the type of operation required to properly carry on a complicated project such as the San Juan-Chama has never been practiced above Elephant Butte, and there is no reason to believe that any substantial improvement can be expected if and when the San Juan-Chama project is constructed and placed in operation. The only thing that is certain is that when improper operation, mistaken assumptions relative to river losses, and inability to control diversions to conform to variations in the supply of San Juan-Chama project water, result in increased diversions of Rio Grande water above Elephant Butte, the burden will fall upon the areas below Elephant Butte whose water supply will be depleted to the extent necessary to supply the new and supplemental uses established as a result of the San Juan-Chama project.

In connection with proposed increased uses by tributary areas on the Rio Grande north of Santa Fa, the extent of existing water uses has apparently not yet been determined. Furthermore, we are unable to see how it will be possible to arrive at an accurate determination of these uses during the interval between authorization and construction. A much longer period for the accumulation of accurate data would appear to be necessary; otherwise, arbitrary assumptions will have to be substituted for accurate information. Without accurate information, it is difficult to see how tributary area works can be properly operated because it will be necessary to distinguish between present

uses of water and increased uses made possible by the construction of project works in the tributary areas. If present uses are not accurately known, how can increased uses be properly accounted for?

Since there are Indian lands in the tributary areas, we assume that should an attempt be made to compel proper operation of the San Juan-Chama project by court action, the State of New Mexico will avail itself of the same legal technicality that it employed to escape its obligations under the Rio Grande compact; that it, the indispensability of the United States as a party to the suit. In view of this probability, should the committee see fit to authorize the San Juan-Chama project, we believe that it will be no more than fair to include a provision in the authorizing legislation that will make the United States a party to any suits that might be filed as a result of improper operation of the San Juan-Chama project.

Mr. ROGERS. Thank you very much, Mr. Gregg.

The Chair recognizes the gentleman from Colorado, Mr. Aspinall.

Mr. ASPINALL. I was beginning to wonder whether this was going to be all rosy and sweet. Although I am disappointed and see some opposition, nevertheless, I want to commend you on a very fine statement.

As I understand your position it is that throughout the years up to the present time, because of many interests in the Rio Grande operation, it has been impossible in your opinion to arrive at equitable supervision in the distribution of water rights. Is that correct?

Mr. GREGG. Substantially, yes. There has been lax and loose operation on the Rio Grande, with practically no effective supervision by the State of New Mexico.

Mr. ASPINALL. Your statement, then, is to the effect that if the authorities of New Mexico have been unable to take care of the operation satisfactorily up to the present time with what they have there would be all the more reason to believe they could not take care of this added responsibility placed upon them by the San Juan-Chama operation in the Rio Grande Valley. Is that it?

Mr. GREGG. Yes, sir. If they cannot operate what they have now, and that is a relatively simple operation, we fail to see how they can superimpose a complicated project such as the San Juan-Chama under the existing setup and properly operate it.

Mr. ASPINALL. How long have you been manager of the Elephant Butte Irrigation District?

Mr. GREGG. For 15 years I have been associated with it, and I have been associated with the district for 28 years.

Mr. ASPINALL. Have you been a water user under the Elephant Butte Irrigation District?

Mr. GREGG. No, sir. I own no farmlands.

Mr. ASPINALL. You are on a salary?

Mr. GREGG. Yes, sir.

Mr. ASPINALL. You are in fact the person in charge of the operation of the Elephant Butte Irrigation District?

Mr. GREGG. Yes, sir.

Mr. ASPINALL. You work for and at the request of the Elephant Butte Irrigation District Board?

Mr. GREGG. Yes, sir.

Mr. ASPINALL. How many compose that board?

Mr. GREGG. There are nine members on the board, all of whom are bona fide farmers within the district.

Mr. ASPINALL. You are here at their request and at the expense of the district?

Mr. GREGG. Yes, sir.

Mr. ASPINALL. How many acres are there in the Elephane Butte Irrigation District?

Mr. GREGG. 90,640 acres with first-class water right.

Mr. ASPINALL. That is all, Mr. Chairman.

Mr. ROGERS. Mr. Chenoweth?

Mr. CHENOWETH. No questions.

Mr. ROGERS. Mr. Saund?

Mr. SAUND. You used the term "imported water." What is that?

Mr. GREGG. The water originating within the San Juan Basin that will be imported into the Rio Grande Basin by means of the San Juan-Chama project.

Mr. SAUND. Your area has representation in the State of New Mexico?

Mr. GREGG. Yes.

Mr. SAUND. What is the proportion of that to the number of people not properly taking care of your interests?

Mr. GREGG. We have our representatives in the State legislature partly on the basis of population. We are, in effect, a political minority in the State of New Mexico which has a very decided bearing upon these controversial matters and upon the operation of the Rio Grande.

Mr. SAUND. Do you mean to imply that you do not believe you can get assistance inside the legislature and within the State of New Mexico?

Mr. GREGG. There is no possibility of obtaining relief through the Legislature of the State of New Mexico. In fact, the Legislature of the State of New Mexico would hardly have jurisdiction over matters such as this.

Mr. SAUND. That is all.

Mr. ROGERS. Mr. Morris?

Mr. MORRIS. Mr. Gregg, I am glad to see my friend here. I may not agree with him and I do not agree with him in his statement, but I am nevertheless glad to have him here.

Mr. Gregg, I know you are familiar with this legislation because I know how thorough you are.

Specifically in section 6 of the legislation do you not feel there is adequate protection in the Federal statute if this transmountain diversion project were to be operated in compliance with all provisions of the Rio Grande compact?

Mr. GREGG. Frankly, we do not, Mr. Morris, for the reason that the Rio Grande compact, due to legal technicalities, is not enforcible. We feel that is the basic defect in the entire situation down there. We do not have an enforcible compact.

Mr. MORRIS. In other words, Mr. Gregg, it would not be this legislation that would be wrong but the compact that you are concerned with?

Mr. GREGG. Yes, but there is a direct relationship in that this project would be superimposed upon the existing development and presumably it would be subject to the provisions of an unenforcible compact. In other words, if there is improper operation of the San Juan-

Chama project, normally our source of relief would be through the Rio Grande compact, but because of this legal technicality the Rio Grande compact stands completely ineffective.

Mr. MORRIS. Your source of relief with regard to imported water would be through the statute which authorizes the legislation, would it not?

Mr. GREGG. As I understand it, that is the reason I am here protesting the enactment of legislation that would authorize a project that will complicate or further complicate an already unsatisfactory situation on the Rio Grande in New Mexico.

Mr. MORRIS. Section 6 states plainly that all the provisions of this act will be in compliance with the Rio Grande compact, regardless of what happened in the past and whether the State of New Mexico complies with the compact. This statute states that all the works contemplated under this legislation will be in compliance with the Rio Grande compact.

Mr. GREGG. I realize that that statement was made, but nevertheless we do have an unenforcible compact so I do not see how this legislation by itself removes the impediments that now make the compact unenforcible. I wish that it did.

Mr. MORRIS. It may not remove the objections to the operation of the compact that you presently have, but I think this legislation would certainly, if the law means anything, state that works under this act should be in compliance with the Rio Grande compact. It seems to me it might possibly help rather than hinder this operation.

Mr. GREGG. Of course, that is entirely up to the State of New Mexico. If the State chooses to respect the compact in every way there would be little ground for our objection.

So far there is no indication that that will be the case.

We appreciate the assurances that are given to us, but actually it is the delivery of water in accordance with the compact obligation that is the important thing.

If those deliveries are not made then the compact does little or no good.

Mr. MORRIS. It is really the enforcement of the compact with which you are concerned?

Mr. GREGG. That is the legal basis for proper operation on the river, yes. It would be if the contract were enforcible.

Mr. MORRIS. That is all, Mr. Chairman.

Mr. ROGERS. Thank you very much, Mr. Gregg, for your presentation.

(COMMITTEE NOTE.—The following letter, relating to Mr. Gregg's testimony, is included in the record, per instructions from the subcommittee chairman, and with the usual subcommittee clearance:)

STATE OF NEW MEXICO,
STATE ENGINEER OFFICE,
Santa Fe, May 27, 1960.

Hon. WALTER ROGERS,
Interior and Insular Affairs Committee,
House of Representatives, Washington, D.C.

DEAR MR. ROGERS: At the hearings on New Mexico's Navajo and San Juan-Chama projects (H.R. 2352 and H.R. 2494) which you conducted in Washington on May 20, Mr. John Gregg, manager of the Elephant Butte Irrigation District, made a statement in opposition to the San Juan-Chama project. The purpose of this letter is to comment on Mr. Gregg's statement. It would be appreciated if this letter could be made a part of the record of the May 20 hearing.

Mr. Gregg's objections were based on three principal points which are set forth and discussed below.

1. The operation of the San Juan-Chama project will be complicated and it will not be possible to account for water imported by the San Juan-Chama project so as to insure that new uses dependent on imported water do not deplete the Rio Grande water supply to which the Elephant Butte Irrigation District is entitled.

This problem has been given careful attention by engineers of the Bureau of Reclamation and the State of New Mexico and these engineers are confident that a system of measurement and accounting that will fully protect all existing rights to the waters of the Rio Grande can be devised and satisfactorily operated. The provisions of paragraphs i, ii, and iii of section 6(a) of the bill provide for the development of a system of measurement and accounting in cooperation with all affected interests. The provisions of those paragraphs will result in the design and establishment of a system of measurement and accounting that has received very careful consideration and review with the rights of all affected interests in mind.

2. The Rio Grande Compact, which was intended to govern operations such as the San Juan-Chama project, is unenforceable because of the indispensability of the United States in any suit involving enforcement of the compact.

It is true that in February 1957, the Supreme Court of the United States dismissed a suit brought against New Mexico and the Middle Rio Grande Conservancy District by the State of Texas in 1951 because of the absence of the United States as an indispensable party; however, in considering the effectiveness of the compact in controlling the operation of the river attention must be given the circumstances which compelled the United States to decline to intervene in the suit. In the "Memorandum for the United States Under Order of October 17, 1955," which was filed in *Texas* v. *New Mexico* in November 1956, the Solicitor General pointed out that since the filing of the suit the United States had taken over the operation of all of the works of the Middle Rio Grande Conservancy District and that, "it (the United States) prefers not to intervene at this time because it believes that its rehabilitation and reclamation work in the area will accomplish everything that can be done toward a solution of the problem. That work is proceeding expediously and satisfactorily." The memorandum also said that in view of those circumstances "* * * * it does not seem inequitable to require Texas to await the possibilities of an administrative solution of the problem." Mr. Gregg's statement that, "Transfer of operation from the Middle Rio Grande Conservancy District to the Bureau of Reclamation has resulted in a change in attitude and some improvement in operation" suggests that the solution contemplated by the Solicitor General is forthcoming. It seems likely that under different circumstances the United States would have intervened.

Also, it is important to note that in the event of the unlawful operation of any existing or proposed project in New Mexico in which the United States has water rights, the Elephant Butte Irrigation District could seek relief under the McCarran Act (ch. 651, 66 Stat. 549, 560). Under this act, which is also known as the act of July 10, 1952, consent is given to join the United States as a defendant in any suit where it appears that the United States is the owner of water rights and is a necessary party to such suit. This act appears to provide for the Elephant Butte Irrigation District the relief requested in the final sentence of Mr. Gregg's statement.

3. The State of New Mexico cannot, or will not, control the operation of the river to protect downstream interests.

The State can and will control the distribution and appropriation of Rio Grande and imported waters for the protection of all interests within the limit of its authority. The State's ability and willingness to do this is convincingly demonstrated by a recent action. In November of 1956 the State engineer assumed jurisdiction over ground-water appropriations in the Rio Grande Valley above Elephant Butte Reservoir by declaration of the Rio Grande underground water basin. Under this jurisdiction the State engineer controls ground-water appropriations which would otherwise, because of the intimate relationship between the surface and ground waters of the Rio Grande Valley, diminish the water supply of the Elephant Butte Irrigation District.

Furthermore, it seems clear that in event of unlawful operation of any existing or proposed project in New Mexico by any person or political subdivision of the State of New Mexico, whether such project utilizes waters of the Rio Grande

or imported waters, the Elephant Butte Irrigation District can seek relief in the courts of the State of New Mexico.

The position of the Elephant Butte Irrigation District as set forth in Mr. Gregg's statement is understandable when it is realized that there is residual bitterness over the issues in the Supreme Court suit filed by Texas in 1951. However, I believe it is clear from the foregoing that the interests of the Elephant Butte Irrigation District are protected by State and Federal law, and that the district is not without recourse in State and Federal courts if the proposed San Juan-Chama project is operated in a manner detrimental to those interests.

Yours very truly,

S. E. REYNOLDS,
State Engineer.

Mr. ROGERS. Mr. McBroom, do you have a statement on this matter?

Mr. MCBROOM. No, sir; I do not have a statement.

Mr. ROGERS. Unless there is some question from members of the committee we will just postpone any further testimony on this until a later date.

Do any of the members have questions?

[No response.]

Mr. ROGERS. Thank you, Mr. McBroom. We will wait until a later date for your testimony.

The Chair will recognize the gentleman from Colorado for some insertions.

Mr. ASPINALL. I have two telegrams I wish to read into the record. One is addressed to me, chairman of the Committee on Interior and Insular Affairs:

Please record in hearings concerning San Juan-Chama diversion. New Mexico San Juan County Farm & Livestock Bureau opposes diversion as proposed. We believe diversion will encroach on and jeopardize existing water rights and curtail industrial municipal developments. We feel agriculture interests have not been adequately represented in San Juan-Chama diversion hearings. San Juan County Farm & Livestock Bureau, Alton K. Brown, president.

Then I have another telegram addressed to me:

The LaPlatta Conservancy District opposes San Juan-Chama diversion because as proposed it will jeopardize the more feasible Animas-LaPlatta project. San Juan-Chama as proposed will waste precious water and we believe will not benefit New Mexico as much as projects proposed within the San Juan Basin where the return flow can be used to satisfy downstream obligations. The LaPlatta Conservancy District, LaPlatta, N. Mex., Glen Hopkins, vice chairman.

Mr. Chairman, I would like to have the record show that Mr. Bill Eakes, of Durango, Colo., representing the users of the proposed Animas-LaPlatta project and other water interests in southwestern Colorado has been present in the room during the hearings today.

I also wish to thank the chairman of the Subcommittee on Irrigation and Reclamation for his willingness to hold this hearing at this time and for his handling of our activities.

Mr. ROGERS. Thank you, Mr. Chairman.

Mr. SAUND. Mr. Chairman, I ask unanimous consent to include in the record at this time a letter from the chief engineer of the Colorado River Board of California to the chairman of the subcommittee, and the amendments proposed to H.R. 2352 and H.R. 2494.

Mr. ROGERS. Without objection those insertions will be included in the record.

(The letter and amendments referred to follow:)

STATE OF CALIFORNIA,
COLORADO RIVER BOARD OF CALIFORNIA,
Los Angeles, May 16, 1960.

HON. WALTER ROGERS,
Chairman, Subcommittee on Irrigation and Reclamation, Committee on Interior and Insular Affairs, House of Representatives, Washington, D.C.

DEAR MR. ROGERS: Reference is made to the announcement released on May 2, 1960, that you have scheduled hearings on H.R. 2352 and H.R. 2494, providing for the Navajo and San Juan-Chama projects, to be held on May 20 and 21. It is indicated therein that the hearings are to be exploratory in nature with action beyond hearings not anticipated this year. It is understood that the time of the committee is limited and that for present purposes the submission of material for the record, rather than a personal appearance, would be assistance.

Accordingly, enclosed on behalf of the Colorado River Board of California is certain material for the record as follows:

1. The views and recommendations of the State of California on the proposed projects, dated April 1958, which were submitted in that year to the Secretary of the Interior for inclusion in his report to you, pursuant to section 1 of the Flood Control Act of 1944. These views supply the background for most of the amendments which the board proposes to the legislation before you and are offered for the record by reason of our understanding that the report of the Secretary has not yet been forwarded for your consideration.

2. Statement of Raymond Matthews, chief engineer for the board, submitted in connection with Senate consideration of a similar bill in 1958. This deals with the problem of the extent of the water supply available for the proposed projects. This problem is a particularly difficult and most important one and is in large part responsible for certain of the amendments the board offers.

3. Proposed amendments: The board is of the firm opinion that certain amendments to the Navajo-San Juan-Chama authorization bills are essential to the protection of the interests of California and other States of the lower Colorado River Basin, and should be adopted if either H.R. 2352, H.R. 2494, or S. 72 is acted upon favorably by the committee. While the board does not consider the projects feasible from either the engineering or economic standpoints, it recognized that these subjects are matters to be determined by the Congress. Accordingly, the board's proposed amendments relate only to the protection of California's rights in the river.

The board's proposed amendments submitted herewith are keyed to H.R. 2352, with some brief explanatory notes. Amendments Nos. 1 and 2 would assure that, in keeping with the purpose of the bills as stated in their titles, only the initial stage of the San Juan-Chama project would be approved and authorized. No. 3 would subject the projects to the various compacts, treaties, and statutes comprising the law of the river. No. 4 would direct the Secretary of the Interior to continue his studies of the quality of the waters of the Colorado River system and to make a comprehensive report thereon to the Congress. No. 5 is a litigation provision permitting suit if the Secretary fails to conform with the law of the river or with applicable State water laws. No. 6 is a proposed limitation on transmountain diversions. No. 7 requires that diversions for either or both of the projects not impair the obligations of the States of the upper division under article III(d) of the Colorado River compact. Similarly, proposed amendment No. 8 imposes a like requirement with respect to article III(c) of the compact.

The Colorado River Board of California requests that this letter and the enclosures be included at an appropriate place in the record of the hearings and trusts that the committee will find this material of assistance in identifying problem areas the board finds in the bills.

Respectfully,

RAYMOND MATTHEW, *Chief Engineer.*

STATE OF CALIFORNIA,
DEPARTMENT OF WATER RESOURCES,
Sacramento, April 9, 1958.

Hon. FRED A. SEATON,
Secretary of the Interior,
Washington, D.C.

DEAR MR. SEATON: Your proposed coordinated report on the San Juan-Chama project, Colorado-New Mexico, and the Navajo project, New Mexico, was transmitted to this Department by letter dated October 17, 1957, from E. G. Nielsen, Acting Commissioner of Reclamation and Glen L. Emmons, Commissioner of Indian Affairs. The report was transmitted for review and comments of the State of California in accordance with section 1 of the Flood Control Act of 1944. On October 25, 1957, a copy of your report was forwarded to the Colorado River Board of California for comments of that agency. The Colorado River Board is the official agency of the State established by the legislature to safeguard and protect the rights and interests of California in and to the water of the Colorado River System.

The report of the department of water resources, to which the comments of the Colorado River Board of California are attached as appendix A, is transmitted herewith.

It is respectfully requested that the report of the department of water resources dated April 9, 1958, and the comments of the Colorado River Board of California on this subject be transmitted to the President of the United States and to the Congress, along with the other material that may be so transmitted.

The State of California recommends that—

1. In the event the San Juan-Chama and Navajo projects are authorized, the authorizing legislation provide specifically that the projects shall not impair, either in quality or quantity, the rights of the State of California in and to the waters of the Colorado River;

2. Any authorizing legislation provide that none of the waters of the Colorado River system shall be exported from the natural basin of that system by means of works constructed under authority of this act, or extensions and enlargement of such works, to the Rio Grande Basin for consumptive use outside of the State of New Mexico, and no such waters shall be made available for consumptive use in any State not a party to the Colorado River compact by exchange or substitution or by use of return flow; nor shall the obligations of the State of New Mexico under the provisions of the Rio Grande compact be altered by any operations of any project for transmountain diversion of Colorado River system water into the Rio Grande Basin;

3. Comprehensive investigations be undertaken by the Department of Interior to ascertain the effects of the proposed San Juan-Chama and Navajo projects, as well as other future water development projects, on the quality of the waters of the Colorado River.

4. Consideration be given to the comments of the Colorado River Board of California regarding the economic aspects of the proposed projects.

Very truly yours,

HARVEY O. BANKS, *Director.*

VIEWS AND RECOMMENDATIONS OF STATE OF CALIFORNIA ON PROPOSED COORDINATED REPORT OF THE SECRETARY OF THE INTERIOR ON SAN JUAN-CHAMA PROJECT, COLORADO-NEW MEXICO, AND NAVAJO PROJECT, NEW MEXICO

INTRODUCTION

By letter dated October 17, 1957, the Acting Commissioner of Reclamation, on behalf of the Secretary of the Interior, transmitted to the State of California the proposed coordinated report of the Department of the Interior on the San Juan-Chama project, Colorado-New Mexico, and the Navajo project, New Mexico. The report was transmitted for review and comment by the State in accordance with provisions of section I of the Flood Control Act of 1944.

Copies of the proposed coordinated report were transmitted by the director of water resources to the Colorado River Board of California for their examination and comment. Due to the voluminous nature of the report, the deputy director submitted a request on January 14, 1958, in behalf of the Colorado River Board of California, for an extension of 45 days in which to prepare comments of the State of California. By letter dated January 28, 1958, the Assistant

Secretary of the Interior reported that the Secretary contemplated withholding transmittal of the reports to the President for a reasonable period of time until comments of some other affected States had been received. The Assistant Secretary further reported that if this State's comments were received after transmittal of the reports to the President, they would be forwarded immediately for consideration.

The proposed coordinated report of the Department of the Interior comprises a letter dated September 6, 1957, from the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, to the Secretary of the Interior, approved and adopted by the Secretary on October 16, 1957, and, in addition, the following reports:

1. Report of the regional director, Bureau of Reclamation, on the San Juan-Chama project, Colorado-New Mexico, dated November 25, 1955.
2. Supplemental report of the regional director, Bureau of Reclamation, on the San Juan-Chama project, dated May 15, 1957.
3. Feasibility report on Navajo Agency, Bureau of Indian Affairs, on the Navajo project, New Mexico, dated January 1955.
4. Supplemental report on Navajo Agency, Bureau of Indian Affairs, on the Navajo project, New Mexico, dated March 1957.

The San Juan-Chama project and the Navajo project are proposed as participating projects in the Colorado River storage project, authorized by Public Law 485, 84th Congress, 2d session. The San Juan-Chama project would divert about 110,000 acre-feet of water annually from the San Juan River, a tributary of the Colorado River, for irrigation and municipal use in the Rio Grande Basin in New Mexico, at an estimated cost of $82,449,000, for initial stage construction. The Navajo project would divert about 508,000 acre-feet annually from the San Juan River for irrigation use within the Navajo Indian Reservation in New Mexico, at an estimated cost of $146,336,300. The foregoing cost figures include interest during construction.

The Acting Commissioner of Reclamation concurred in and adopted the recommendations of the regional director, as follows:

"1. Congressional approval of the plan of development for a San Juan-Chama project providing for diversion of 235,000 acre-feet of San Juan River flows into the Rio Grande Basin, as contemplated by the ultimate development described in this report, be sought;

"2. That authority be sought for the Secretary of the Interior acting pursuant to the Federal reclamation laws (act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof) to construct the initial stage development of San Juan-Chama project as a participating project in the Colorado River storage project as proposed in this report, but with such modification of, omissions from, or additions to the works as the Secretary of the Interior may find proper;

"3. Authority be sought for the Secretary of the Interior under the provisions of the same legislation to operate the collection, diversion and regulation works of the initial stage development of the San Juan-Chama project as proposed in this report;

"4. Achievement of the recreational measures contemplated under the initial stage development and recommended by the National Park Service be provided for insofar as practicable under agreements between the appropriate Federal and State agencies together with the concerned water users' organizations;

"5. Additional detailed studies for fish and wildlife resources affected by the initial stage development be conducted as necessary, after project authorization, in accordance with section 2 of the act of August 14, 1946 (60 Stat. 1080); and that such reasonable modification in the authorized facilities be made by the Secretary of the Interior as he may find appropriate to preserve and propagate these resources; and

"6. Authorizing legislation provide that—

"(*a*) Construction will not be initiated until a contract or contracts satisfactory to the Secretary of the Interior shall have been executed between a water users' organization and the United States for repayment of the appropriate reimbursable costs and for payment of the appropriate costs of operation and maintenance; and

"(*b*) The portion of the construction costs found by the Secretary to be properly allocable to recreational purposes be nonreimbursable and nonreturnable. Also, the portion of the costs, if any, found by the Secretary to be properly allocable to fish and wildlife purposes be nonreimbursable and nonreturnable."

The Commissioner of the Bureau of Indian Affairs recommended:

"1. Authority be sought for the Secretary of the Interior acting pursuant to the act of April 11, 1956 (70 Stat. 105, 106), to construct the Navajo project as a participating project, but with such modification of, omissions from, or additions to the works as the Secretary of the Interior may find proper, and to operate and maintain the works required for the project as described in the agency's reports.

"2. The Navajo project lands be developed solely as a Navajo Indian irrigation project.

"3. Authorization for this project provide authority for the acquisition and addition to the Navajo Indian Reservation of Federal, State, and private lands necessary for revision of the project in accordance with the letter of the Governor of New Mexico, dated December 12, 1956.

"4. Authorization be sought in conformity with the criteria contained in the March 1957 supplemental report to provide for—

"(*a*) Purchase by the Navajo Indian Tribe, or exchange, of Navajo Reservation lands for State-owned lands within the project boundary in conformity with resolution of the Advisory Committee of the Navajo Tribal Council No. ACJ–1–57 passed January 9, 1957.

"(*b*) Purchase by the Navajo Indian Tribe, or exhange, of Navajo Reservation lands for Federal-owned lands within the project boundary, in conformity with the resolution of the Advisory Committee of the Navajo Tribal Council ACJ–1–57 passed January 9, 1957.

"5. Additional studies of incremental canal capacity be made prior to construction of the project to determine the feasibility of conveying domestic and industrial water supplies as recommended by the Public Health Service in its report of December 1, 1954, and that an equitable portion of project costs be allocated to that purpose for repayment by the beneficiaries."

In their joint transmittal to the Secretary of the Interior, the Acting Commissioner of Reclamation, and the Commission of the Bureau of Indian Affairs jointly recommended:

"Pursuant to the expressed desires of the State of New Mexico for coordination and processing of these two proposed project reports, and subject, of course, to consideration of comments received, we recommend that you approve and adopt this coordinated report as your proposed coordinated report on plans for development of the San Juan-Chama and Navajo participating projects of the Colorado River storage project, and that you authorize us to transmit copies to the affected States and the Secretary of the Army for review as required by the Flood Control Act of 1944 (58 Stat. 877), to the States of New Mexico and Colorado for the views and recommendations of the head of the agency exercising administration over the wildlife resources in each of those States pursuant to the provisions of the act of August 14, 1946 (60 Stat. 1080), to the other interested Federal agencies for their comments as provided by interagency agreement, and to the Upper Colorado River Commission."

The Secretary of the Interior approved and adopted the proposed coordinated report on October 16, 1957.

REVIEW AND COMMENT BY DEPARTMENT OF WATER RESOURCES

For the sake of brevity, the reports of the Bureau of Reclamation and the Bureau of Indian Affairs will be referred to as the "San Juan-Chama Report" and the "Navajo Report," respectively.

San Juan-Chama project

The "San Juan-Chama Report" describes initial and ultimate stages of a project for furnishing (1) municipal and industrial water to the city of Albuquerque; (2) supplemental irrigation water to the Rio Grande Valley, and, in addition, for the ultimate stage; and (3) recharge water to depleted groundwater basins along the Rio Grande. These deliveries would be effected by means of a diversion through the Continental Divide from the upper tributaries of San Juan River in Colorado to the Rio Chama, tributary to the Rio Grande, in New Mexico.

Project facilities.—The project plan consists primarily of three dams to regulate the runoff in the San Juan Basin for later diversion to the Rio Grande Basin; five diversion dams located on the East Fork of the San Juan River, Rito Blanco, Rio Blanco, Little Navajo River, and Navajo River, about 49 miles of conduit, most of which is closed; and Heron No. 4 dam on Willow Creek, a

tributary of the Rio Chama, to regulate imported water. The report contains only a general description of the proposed project facilities, and the information is insufficient to permit a determination of the adequacy of project design, construction feasibility, and effectiveness of the proposed works in accomplishing project objectives.

Water supply.—The initial unit of the San Juan-Chama project proposes an average annual transmountain diversion of 110,000 acre-feet of water, of which 57,300 acre-feet would be for municipal and industrial use within the city of Albuquerque and 52,700 acre-feet would be for supplemental irrigation of 120,900 acres. Under the ultimate plan, the average annual diversion would be 235,000 acre-feet, of which 42,500 acre-feet would replace miscelloneous groundwater basin depletions. These amounts represent net diversions from the Colorado River drainage basin since the water is exported and no return flow is possible. Such diversions would decrease the mean seasonal flow of the Colorado River downstream from its confluence with the San Juan River, affecting power generation and the supply available for diversion by the State of California, especially during drought periods.

In addition, this reduction in flow would further aggravate channel conditions in certain reaches of the Colorado River, especially downstream from Imperial Dam, where diminution of flow during recent drought years has impeded efforts to sluice silt downstream. It may be necessary to mechanically remove silt from the channel between Imperial Dam and the International Boundary by dredging or by other means and to effect disposal in offchannel areas.

Water quality.—It is manifest that the aforementioned diversions from the Upper Colorado River Basin will adversely affect the quality of Colorado River water available for diversion and use by California; however, the degree of this effect is not known at this time. A comprehensive investigation should be undertaken by parties proposing to export water from Colorado River drainage basin to determine the changes in the quality of Colorado River water, which would result from such diversions, under conditions of both present and future development. Article VIII of the Colorado River compact assures that the rights of California thereunder to waters of Colorado River shall not be impaired in quantity or quality.

Project costs.—The initial unit of the San Juan-Chama project is estimated by the Bureau of Reclamation to cost $82,449,000, including interest during construction, on the basis of January 1957, price levels. The Bureau further estimates the cost of the ultimate project to be $148,827,000, on the basis of January 1957 price levels.

The report does not contain sufficient information concerning quantities, unit prices, and haul distances to permit a satisfactory analysis of project cost estimates. It is noted, however, that project costs do not include the cost of Navajo Dam and Reservoir attributable to the San Juan-Chama project. It is felt that this cost should be included in the estimate, since without this facility, the San Juan-Chama project would certainly not function. The Bureau of Reclamation has estimated that about $800,000 of the cost of Navajo Dam and Reservoir would be attributable to the San Juan-Chama project if it were not an initial unit of the Colorado River storage project.

Furthermore, a cursory inspection of that portion of the report discussing benefit-cost ratios reveals that the Bureau of Reclamation estimated these ratios for 50-year and 100-year periods of analyses, using an interest rate of 2½ percent for computing average annual costs. Neither the 100-year period nor the 2½ percent interest rate are considered realistic. The 50-year period of analysis is now generally accepted among Federal and State agencies, and this Department presently uses an interest rate of 3½ percent in studies concerning long-term financing of water projects.

Project benefits.—No attempt has been made to conduct a detailed review of project benefits. It is noted, however, that reduction in power generation and revenues at downstream power facilities as a result of the San Juan-Chama project was not considered in estimating project benefits.

The Bureau of Reclamation has estimated that for the initial unit of the project and for a 50-year period of analysis, benefit-cost ratios for total and direct benefits are 1 to 1 and 0.79 to 1, respectively. It is apparent that any increase in project costs or consideration of reduction of power revenues would result in a very unfavorable benefit-cost ratio. The project under review might be economically feasible if it were modified to provide water for industrial and municipal purposes only.

Payment capacity.—Again, no detailed review of financial feasibility has been attempted; however, it is noted that users of irrigation water would be unable to repay their share of project costs, and that approximately $45,100,000 from revenues credited to the Upper Colorado Basin fund would be utilized to repay initial unit project costs. It is agreed that the payment capacity of users of municipal and industrial water would be substantial.

Water rights.—With reference to export of water from Colorado River drainage area, article II(f) of the Colorado River compact states as follows:

"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.*" [Emphasis added.]

Although the proposed diversion through the Continental Divide does not violate this provision of the Colorado River compact, this provision of the compact would be violated if Colorado River Basin water flowed out of New Mexico. Since the project service area is within the drainage area of the Rio Grande, the flow of which is controlled by the Rio Grande compact, the Colorado River Basin water would, in some part, unavoidably be directly or indirectly transported out of New Mexico. The Rio Grande compact provides for certain deliveries of Rio Grande water from New Mexico to Texas, and it is understood that New Mexico has incurred an appreciable debit in such deliveries.

The Navajo project

The "Bureau of Indian Affairs' Navajo Report" discusses a project for diversion of water from Navajo Reservoir on the San Juan River for irrigation of 110,630 acres lying south of San Juan River within the Navajo Indian Reservation in New Mexico.

Project facilities.—Project facilities would consist of canals, siphons, and pumping and generating plants to distribute water from Navajo Reservoir to areas over 40 miles south of San Juan River. Data contained in the report did not permit a detailed review of project design, construction feasibility, or effectiveness of the facilities to accomplish the purpose of the project.

Water supply.—Under ultimate conditions of development, the Navajo project would require an average annual diversion of 508,000 acre-feet of water from San Juan River, with an average annual stream depletion of 282,000 acre-feet. This depletion is approximately 55 percent of the gross diversion. In view of the distance from San Juan River that project water would be conveyed, and the probable loss of a large portion of the return flows, due to consumptive use by native vegetation, it is quite probable that the average annual stream depletion would be appreciably in excess of the estimated amount. Additional studies by the Bureau of Indian Affairs, to determine actual stream depletion should be undertaken. The project as proposed would, like the previously mentioned San Juan-Chama project, decrease the mean seasonal discharge of the Colorado River below its confluence with the San Juan River and would, therefore, reduce the supply available for power generation and diversion by the State of California, particularly during periods of subnormal runoff. Removal of silt from the Colorado River Channel downstream from Imperial Dam would also be hindered by a diminution of flow.

Water quality.—It is reasonable to expect that the quality of the water returning to the San Juan River from the proposed Navajo project service area would be inferior to the quality of the 508,000 acre-feet of water diverted yearly. This condition, and the reduction in stream flow as a result of this diversion, would undoubtedly adversely affect the quality of the Colorado River water available for use in the State of California. Water quality studies described heretofore should be undertaken.

Project costs.—The Bureau of Indian Affairs has estimated the cost of construction of the Navajo project to be $146,336,300, including interest during construction and excluding any portion of the cost of Navajo Dam and Reservoir. The annual equivalent cost of the project is estimated in the report to be $5,017,300, at 1957 prices, using an interest rate of 2½ percent and a repayment period of 100 years. This cost includes operation and maintenance costs and a depletion charge of $2.50 per acre-foot of Colorado River discharge depletion. Information as to construction quantities and unit prices in the "Navajo Report" was insufficient to permit a review of project costs. It is felt, however, that the cost of Navajo Dam and Reservoir attributable to the Navajo project

should be included in project costs. It is estimated that this allocation would amount to about $36 million. In addition, benefit-cost ratios were calculated using a 100-year period of analysis and an interest rate of 2½ percent. As previously stated in connection with comments on the proposed San Juan-Chama project, this period of analysis and interest rate are considered unrealistic.

Project benefits.—According to the "Navajo Report," annual equivalent irrigation and school benefits to accrue from the project are $7 million. It is estimated in the report that the benefit-cost ratios for total irrigation benefits and total irrigation and school benefits are 1.2 to 1 and 1.39 to 1, respectively. From a brief examination of the reported benefits, it would appear that project costs would exceed project benefits if a 50-year period of analysis and a 3½ percent interest rate were used and if the cost of Navajo Dam and Reservoir and the loss in power revenues at downstream power facilities were considered.

Payment capacity.—The Bureau of Indian Affairs proposes that repayment of construction costs assessed against Indian lands would be deferred as long as the lands remain in Indian ownership. The cost of Navajo Dam and Reservoir, which was not charged against the project, would be repaid from the Upper Colorado River Basin fund, which would be maintained with power revenues from the Colorado River storage project. Payment capacity, or the ability of the water users to repay project cost over a reasonable period, was, therefore, not demonstrated in the "Navajo Report."

CONCLUSIONS

This Department is concerned with the effects of the proposed San Juan-Chama and Navajo projects on the availability to the State of California of water of the Colorado River to which it is entitled and the equality of this supply. There is no objection to any projects which would utilize waters to which a State is rightfully entitled under final allocations of the Colorado River compact and related laws and documents. With these criteria in mind, it is concluded, as a result of this Department's review of the San Juan-Chama and Navajo reports, that—

1. The proposed San Juan-Chama project diversions of 110,000 and 235,000 acre-feet per year for the initial and ultimate unit, respectively, and the annual stream depletion resulting from the Navajo project, which is estimated by the Bureau of Indian Affairs to be 282,000 acre-feet, would decrease the mean seasonal flow of the Colorado River downstream from its confluence with the San Juan River, affecting the supply available for diversions by the State of California, power generation, and channel silt removal, especially during drought periods.

2. It is probable that the stream depletion occasioned by the Navajo project would be substantially in excess of the estimated amount; consequently, additional studies regarding actual stream depletion should be conducted.

3. The proposed projects, if authorized and constructed, must not be operated so as to infringe on rights of the State of California to and in waters of the Colorado River.

4. The proposed project diversions would result in degradation of the quality of Colorado River water available for use by the State of California; consequently, a comprehensive investigation should be undertaken by parties proposing to utilize waters of the Colorado River to determine the changes in water quality as a result of such use.

RECOMMENDATIONS

As a result of the review of the San Juan-Chama and Navajo reports, it is recommended that—

1. In the event the San Juan-Chama and Navajo projects are authorized, the authorizing legislation provide specifically that the projects shall not impair either in quality or quantity the rights of the State of California in and to the waters of the Colorado River.

2. Any authorizing legislation provide that none of the waters of the Colorado River system shall be exported from the natural basin of that system by means of works constructed under authority of this act, or extensions and enlargement of such works, to the Rio Grande Basin for consumptive use outside of the State of New Mexico, and no such waters shall

be made available for consumptive use in any State not a party to the Colorado River compact by exchange or substitution or by use of return flow; nor shall the obligations of the State of New Mexico under the provisions of the Rio Grande compact be altered by any operations of any project for transmountain diversion of Colorado River system water into the Rio Grande Basin.

3. Comprehensive investigations be undertaken by the Department of Interior to ascertain the effects of the proposed San Juan-Chama and Navajo projects, as well as other future water development projects, on the quality of the waters of the Colorado River.

Submitted by:

WILLIAM L. BERRY,
Chief, Division of Resources Planning.

SACRAMENTO, CALIF., *April 9, 1958.*

APPENDIX A

STATE OF CALIFORNIA,
Los Angeles, February 7, 1958.

Interdepartmental communication.

To: Mr. Harvey O. Banks, director, Department of Water Resources, 1120 N Street, Sacramento, Calif.

From: Colorado River Board of California, 909 South Broadway.

Subject: Review of Federal reports—Navajo project, New Mexico, and San Juan-Chama project, Colorado and New Mexico.

Reference is made to a letter dated October 17, 1957, from E. G. Nielsen, Acting Commissioner of Reclamation, and Glen L. Emmons, Commissioner of Indian Affairs, transmitting to you in accordance with section 1 of the Flood Control Act of 1944 the proposed coordinated report of the Department of the Interior on the Navajo and San Juan-Chama projects, for review and comment by the State of California.

In accordance with your request of October 25, 1957, the views and comments of the Colorado River Board of California are submitted herewith, as approved by the board at its regular meeting on February 5, 1958.

It is requested that the views of the Colorado River Board attached hereto be incorporated in or transmitted with the report to be submitted for the Governor as the views and recommendations of the State of California on the proposed projects.

RAYMOND MATTHEW, *Chief Engineer.*

VIEWS OF COLORADO RIVER BOARD OF CALIFORNIA ON PROPOSED REPORT OF DEPARTMENT OF INTERIOR, OCTOBER 16, 1957, ON NAVAJO PROJECT, NEW MEXICO, AND SAN JUAN-CHAMA PROJECT, COLORADO AND NEW MEXICO

DESCRIPTION OF PROJECTS

The Interior Department report comprises a letter dated September 6, 1957, from the Acting Commissioner of Reclamation and the Commissioner of Indian Affairs, to the Secretary of the Interior, approved and adopted by the Secretary on October 16, 1957, and in addition, the following reports:

(1) Report of the regional director, Bureau of Reclamation, on the San Juan-Chama project, Colorado-New Mexico, dated November 25, 1955.
(2) Supplemental report of the regional director, Bureau of Reclamation, on the San Juan-Chama project, dated May 15, 1957.
(3) Feasibility report of Navajo Agency, Bureau of Indian Affairs, on the Navajo project, New Mexico, dated January 1955.
(4) Supplemental report of Navajo Agency, Bureau of Indian Affairs, on the Navajo project, New Mexico, dated March 1957.

Both projects are proposed for authorization as participating projects of the authorized Colorado River storage project, in accordance with the provisions of Public Law 485, 84th Congress, 2d session. Both would divert water from the San Juan River, a major tributary of the Colorado River. Construction and operation of Navajo Dam and Reservoir on San Juan River, authorized by Public Law 485 as a unit of the Colorado River storage project, would be essential to the successful operation of both the projects under review herein, but particularly and primarily to the operation of the Navajo Indian irrigation project.

Cost of the dam and reservoir according to the latest available estimate by the Bureau of Reclamation would be $42,372,000.

Navajo project

Under the proposed Navajo irrigation project, water would be diverted from the San Juan River at Navajo Dam to irrigate 105,100 acres net of Indian lands in northwestern New Mexico, on or adjacent to the Navajo Indian Reservation. In the 1955 report a project of 137,250 acres was considered, comprising non-Indian as well as Indian lands, but at the request of New Mexico the project was reduced in size and in the 1957 report is recommended for development wholly as an Indian project.

The lands proposed to be irrigated are in irregular and scattered areas south of the San Juan River extending from Bloomfield, N. Mex., westward almost to the Arizona State line. They are mostly bench lands ranging from 5,000 to 6,200 feet in elevation, several hundred feet above the elevation of the river, and extending southward 16 to 40 miles from the river.

Construction cost of the project is estimated by the Bureau of Indian Affairs at $126,865,000 apparently on the basis of January 1957 prices. The entire cost is allocated in the report to irrigation, but under the authority of the act of July 1, 1932 (47 Stat. 564) and of section 6 of Public Law 485, 84th Congress, it is proposed in the report that none of the cost be reimbursable.

Annual diversion requirements are estimated in the report at 508,000 acre-feet, and average annual stream depletion at 282,000 acre-feet, including 29,000 acre-feet of evaporation from the Navajo Reservoir.

San Juan-Chama project

The San Juan-Chama project would divert water from upper tributaries of the San Juan River in Colorado and convey it through the Continental Divide into the Rio Chama, a tributary of the Rio Grande, to provide municipal and industrial water for Albuquerque and supplemental irrigation water in the Rio Grande Basin. Under the initial plan of construction recommended in the report, the average annual diversion from the San Juan River would be 110,000 acre-feet, divided 57,300 acre-feet for the city of Albuquerque and 52,700 acre-feet for supplemental irrigation of 120,900 acres in the middle Rio Grande Valley. Of this acreage, 39,300 acres are on tributaries of the Rio Grande above the mouth of the Rio Chama and hence out of reach of water diverted from the San Juan River. Increased depletions on those tributaries would be replaced below the mouth of the Rio Chama by San Juan River water. The other 81,600 acres is in the Middle Rio Grande Conservancy District below the mouth of the Rio Chama.

In the ultimate stage of the project for which the report suggests congressional approval, the average annual diversion would be 235,000 acre-feet, divided 55,800 acre-feet for municipal and industrial supply, 136,700 acre-feet for supplemental irrigation, and 42,500 acre-feet for the replacement of miscellaneous depletions which have already occurred. Some of the supplemental irrigation water would be provided to the Elephant Butte Irrigation District extending along the Lower Rio Grande from Elephant Butte Dam to Texas.

Construction cost of the initial plan is estimated by the Bureau of Reclamation on the basis of January 1957 prices at $81,069,000. Proposed allocation of costs is as follows:

Allocation of construction costs (initial stage)

Irrigation	$50,315,000
Municipal and industrial water	27,594,000
Recreation	360,000
Fish and wildlife	----------
Deferred to future uses	2,800,000
Total	81,069,000

It is proposed in the report that the entire allocation to municipal and industrial water supply, including interest during construction, be repaid from water supply revenues in 50 years with interest on the unpaid balance at a rate of 2½ percent. Irrigators would pay $8,010,000 of the irrigation cost without interest in 50 years and the remainder of the irrigation allocation plus the $2,800,000 deferred to future uses is proposed to be repaid from the Upper Colorado River Basin fund as provided in Public Law 485.

SUMMARY OF VIEWS

1. Neither the Navajo project nor the San Juan-Chama project as proposed in the report should be authorized by the Congress at this time for construction as Federal undertakings. Neither project is economically justified. Contrary to the unrealistic economic analyses in the report, both projects would have benefit-cost ratios less than unity.

2. According to estimates in the report, the Navajo project would cost far more than the values created. The construction cost including the cost of necessary storage is estimated at $163 million or $1,550 per acre on the 105,000 acres to be served. None of the construction cost would be repaid. The capital subsidy including interest during construction and development periods would be about $2,500 an acre or about $240,000 per farm family. No net benefit would accrue to the Nation. The benefit if any would be entirely local.

3. The San Juan-Chama project as proposed in the report is infeasible because of the high cost of the irrigation development. It is proposed to spend $200 to $1,200 an acre to provide a supplemental supply of about 0.4 acre-foot of water per acre per annum or only a small fraction of the total irrigation requirement. The cost per equivalent acre on a full water supply basis would be $1,500 to $9,000.

4. The irrigators under the proposed San Juan-Chama project could repay only about 16 percent of the construction cost allocated to irrigation according to estimates in the report. The remaining 84 percent, or about $42 million, is proposed to be repaid from Colorado River storage project power revenues within a 50-year period according to the provisions of Public Law 485, 84th Congress, 2d session. From information supplied to date, it is questionable whether sufficient surplus storage project power revenues will be available to meet the subsidy requirements of the participating projects already authorized by Public Law 485 within the time limit specified in the act. It appears, therefore, that no power revenues would be available to repay the $42 million of the San Juan-Chama project irrigation cost within 50 years as required by Public Law 485.

5. In addition to its lack of economic feasibility, it appears that the San Juan-Chama project, if constructed and operated as proposed in the report, would violate the Colorado River compact by causing an increase in the flow of the Rio Grande at the New Mexico-Texas State line as a result of importation of Colorado River system water.

6. On the basis of estimates and information in the report, it appears that a transmountain diversion project might be justified for the single purpose of providing municipal and industrial water to the city of Albuquerque, and that the costs of a project limited to such purpose could be fully repaid with interest by the beneficiaries. However, if Federal participation in such a project were proposed, the State of New Mexico should be required to guarantee that none of the water diverted from the Colorado River system would be used in a State not a party to the Colorado River compact.

7. Because of the probable detrimental effects of a transmountain diversion from the Colorado River Basin upon the quality of the water remaining in the basin, there should be no authorization of a transmountain diversion for use in New Mexico unless the authorization prescribes a reasonable limitation in perpetuity upon the aggregate amount of all such diversions.

8. Since the primary and almost sole purpose of the Navajo Dam and Reservoir would be to serve the Navajo Indian irrigation project and since the irrigation project as proposed in the report is infeasible, construction of the Navajo Dam should be deferred until such time as it may be proved to be necessary as a unit of a feasible project for irrigation or some other useful purpose.

No storage would be needed at the Navajo site in connection with a diversion to the Rio Grande Basin limited to the 52,000 acre-feet a year average contemplated in the report for municipal and industrial use alone.

Detailed comments supporting these summarized views follow.

DETAILED COMMENTS

I. NAVAJO IRRIGATION PROJECT

ECONOMIC ASPECTS

Navajo Dam and Reservoir

Although Public Law 485 as passed by the 84th Congress includes authorization of construction of the Navajo Dam as a unit of the storage project, the dam is an essential and integral part of the Navajo irrigation project, as evidenced by the 1955 feasibility report and by testimony of Reclamation Bureau officials at committee hearings with respect to the project.

In the 1957 supplemental report, the cost of the Navajo Dam is excluded from the financial analysis of the irrigation project, for the reason that "the size of the Navajo Reservoir has not been determined." Such exclusion is unwarranted and obscures the true character of the irrigation project as to financial or economic feasibility. Therefore in the analyses and comments herein most of the cost of the Navajo Dam and Reservoir is included as a part of the cost of the Indian irrigation project as it properly should be in any appraisal of the financial and economic worth of the project.

In the 1955 feasibility report the estimated $36,400,000 cost of the Navajo Dam and Reservoir was distributed $35,600,000 to the Navajo irrigation project and $800,000 to the San Juan-Chama project, although this proposed distribution was not carried into the repayment or benefit-cost analyses in the report. In the appropriation hearings for fiscal year 1958, the estimated total cost was increased to $36,900,000. Of this total, the amounts to be assigned to the two water use projects, in the same ratio as in the 1955 report, would be $36,100,000 to the Navajo project and $800,000 to the San Juan-Chama.

Advice has been received from the Salt Lake City regional office of the Bureau of Reclamation that a total capacity of 1,700,000 acre-feet is now contemplated for Navajo Reservoir, with an estimated cost of $42,372,000. It is indicated also that the reservoir would be used in part to serve future industrial water requirements in the San Juan Basin estimated at 225,000 acre-feet a year. However, in the absence of revised allocations of cost it is presumed herein that the amounts allocated to the Navajo and San Juan-Chama projects would remain substantially the same as those indicated above.

Cost of project

Construction cost of the project would be extremely high in relation to the potential value of the land to be developed, the local or regional benefits to be derived, and the contribution, if any, to the gross national income. Total construction cost including $36,100,000 for the Navajo Dam and Reservoir would be approximately $163 million according to the estimates of the Bureau of Reclamation and the Bureau of Indian Affairs. Annual costs of operation, maintenance, and replacement are estimated at $314,700, included $304,200 for the irrigation project and $10,500 for the Navajo Dam and Reservoir. The following calculations show some of the reasons why the project would be an uneconomic investment:

$$\text{Capital cost per acre} = \frac{\$163,000,000}{105,099} = \$1,550$$

$$\text{Capital cost per farm family} = \frac{\$163,000,000}{1,100} = \$148,000$$

The indicated capital cost per acre is at least six times the probable value of the land fully developed for irrigation. Cost of the main canal alone is estimated in the 1957 report at $95,500,000, or about $900 an acre. From the 1953 report of the New Mexico State engineer and Interstate Stream Commission on "A Review of the San Juan River Problem in New Mexico," the following excerpt is apropos:

"Although areas of several thousand acres of good farm land occur in one block, one of the most undesirable features of the project area is the rather scattered and noncontiguous nature of the adapted farm lands. The areas are separated by washes, shale hills, igneous intrusions, and erosion resistant formations which will necessitate an extensive water distribution system."

The Bureau of Indian Affairs reports contain only generalized plans and summarized costs for the proposed project. For this reason no analysis can be made herein as to the adequacy of the designs and estimates.

However, in considering the cost of development indicated by current estimates, it should be borne in mind that the history of irrigation projects in the West shows in almost every case a construction cost considerably greater than the estimate at the time of project authorization.

Repayment of costs

The 1957 supplemental report contains no statements as to the ability of the irrigators to repay the cost of the proposed project, since the costs are all treated therein as nonreimbursable. According to that report, the construction costs allocated to the irrigation of Indian lands and within the ability of such lands to repay are subject to the act of July 1, 1932 (47 Stat. 564) which defers repayment of such costs as long as the lands remain in Indian ownership. Costs beyond the capacity of the lands to repay are declared nonreimbursable by section 6 of Public Law 485, 84th Congress.

Although the 1957 report is not clear as to payment of annual costs of operation, maintenance, and replacement, a letter from the Gallup area director, Bureau of Indian Affairs, dated December 19, 1957, indicates that the source of funds to pay such charges would be "the Navajo Indian water users assigned to the project lands."

No showing is made in the reports as to when or how the cost of the Navajo Dam and Reservoir would be repaid from power revenues of the Colorado River storage project. It appears that it would be at least 50 years before the power allocation costs of the storage project would be repaid and surplus power revenues become available for application to such cost as that of the Navajo Dam. During such a period, accrued interest charges to the Nation's taxpayers on the Navajo Dam would amount to $124,900,000 at 3 percent compounded annually.

Land classification

No land classification is given for the reduced project in the 1957 report but data in the 1955 report indicate about one-third would be class 1 and two-thirds class 2. The report considers class 1 to be suitable in all respects for irrigation and cultivation, and class 2 only moderately suitable and lower in productive capacity.

Benefit-cost analyses

Benefit-cost ratios are estimated by the Bureau of Indian Affairs in the 1957 report as follows:

Total cost plus 2½ percent interest during construction	$146,336,300
Annual equivalent costs:	
2½ percent over 100 years (0.0273)	4,008,600
Operation, maintenance, and repair, at $2.75 per acre	304,200
Colorado River depletion charge, at $2.50 per acre-foot	704,500
Total	5,017,300
Benefits:	
Irrigation, at $54.42 per acre	6,020,500
Education cost reduction	967,600
Total	6,988,100
Benefit-cost ratios:	
Irrigation benefits	1.20–1
Irrigation and school benefits	1.39–1

In the above tabulation no account is taken of the cost of Navajo Dam and Reservoir. If the portion of such cost attributable to the Navajo irrigation project is included, as it should be, the calculation is revised as follows:

Total cost, plus 2½ percent interest during construction	$188,300,000
Annual equivalent costs:	
2½ percent over 100 years (0.0273)	5,140,600
Operation, maintenance, and repair ($304,200+$10,500)	314,700
Colorado River depletion charge	704,500
Total	6,159,800

Benefit-cost ratios:

$$\text{Irrigation benefits } \frac{6,020,500}{6,159,800}=0.98 \text{ to } 1.00$$

$$\text{Irrigation and school benefits } \frac{6,988,100}{6,159,800}=1.13 \text{ to } 1.00$$

The 1957 report does not contain a detailed breakdown of benefits. In the 1955 report, for a project of 137,250 acres, the estimated average annual benefits, again on the basis of a 100-year period, are tabulated as reproduced below.

Estimated average annual benefit values

	South San Juan division	Shiprock division	Total
Irrigation:			
Direct	$611,310	$2,351,120	$2,962,430
Indirect	636,320	2,592,560	3,228,880
Public	253,770	1,023,780	1,277,550
Education cost reduction		957,600	957,600
Total irrigation benefits			8,426,460
Flood control			31,200
Recreation			130,000
Inundation of farmland			−51,750
Total project annual equivalent benefits			8,535,910
Rounded to			8,536,000

According to the Bureau of Indian Affairs 1955 estimates, the annual irrigation benefits aggregating $7,469,000 would be about 87 percent of the total annual benefits, but the direct irrigation benefits of $2,962,000 would be only 35 percent of the total. Indirect and public irigation benefits as estimated in the report would be 150 percent of the direct benefits, a ratio which appears entirely beyond reason.

The 1955 estimate of $7,469,000 annual total irrigation benefits amounts to $54.42 per acre per year. Direct benefits alone would amount to only $21.58 per acre per year.

In the 1957 supplemental report, the rate of $54.42 per acre is used to compute the total annual irrigation benefits of $6,020,500 for the reduced area of 110,630 acres (including farmsteads and other nonproductive areas), with no breakdown given of direct and indirect benefits. The estimated education cost reduction of $957,600 a year in the 1955 report is carried over with an apparent $10,000 error as $967,600 into the 1957 report, making a total estimated annual benefit of $6,988,100 for the smaller area. At the rate per acre derived from the 1955 report, the direct irrigation benefit on the 110,630 acres in the reduced project would be $2,387,000 a year, or only about 34 percent of the total annual benefits.

Estimates of benefits in the 1955 report take into consideration farms operated by non-Indians as well as farms operated by Indians. It is questionable whether the annual benefit per acre thus derived may properly be applied to the irrigable area in the all-Indian project recommended in the 1957 report.

Little or no information is given to show how the so-called indirect and public benefits are computed but, as used in the report, the amounts appear to be excessive. In the words of the House Committee on Public Works, 82d Congress, 2d session, "Some of the effort to place monetary value on indirect (secondary) benefits is nothing short of ludicrous." From a national standpoint, the indirect or secondary benefits should be given little if any weight in considering the justification of irrigation developments, since equivalent sums of money in alternative investments, either public or private, would produce equivalent or possibly greater effects upon the national economy.

It seems doubtful that the estimated benefits from the reduction of Federal costs of educating Indian children would really accrue. The estimates are based on rather tenuous arguments and admitted uncertainties.

Revised benefit-cost ratios

Apparently overlooked in the benefit-cost analyses in the report is the fact that the proposed additional consumptive use of water would reduce the hydroelectric power output at downstream plants. Such a reduction would be a detriment from the national standpoint. The value of the lost power should be deducted from the estimated project national benefits. It is roughly estimated herein that the reduction in power output at the Glen Canyon, Hoover, Davis, and Parker powerplants that would be caused by the estimated annual depletion of 282,000 acre-feet by the Navajo project would have a monetary value of $1,400,000 per year.

Assuming the estimate of total annual benefits in the reports is correct, the loss of power would reduce the annual amount to $5,588,100. With this reduced annual figure the benefit-cost ratio of the project including Navajo Dam, for the 100-year period of analysis and the 2½ percent interest rate used in the report, would be 0.91 to 1 instead of 1.39 to 1 ratio shown in the report.

The annual equivalent costs for comparison with benefits are estimated in the report using a 2½-percent interest rate and a 100-year period of analysis. Such a procedure is entirely unrealistic. Present interest rates for Federal borrowing exceed 3 percent and have been nearly 4 percent recently.

Most official agencies and organizations studying the subject, including the Presidential Advisory Committee on Water Resources Policy in its 1955 report, strongly recommend 50 years as the maximum period that should be considered for analysis of economic justification of water resource projects.

Finally, therefore, after adjusting the benefits for the estimated reduction in power generation as indicated above, applying a 3-percent interest rate to costs, and using the recommended 50-year period of analysis, the benefit-cost ratios of the Navajo project including Navajo Dam are calculated as follows:

		Benefit-cost ratios
Annual costs	$11,351,800	
Annual benefits:		
Direct	2,388,000	0.21–1
Total	5,588,100	.49–1

These ratios are more indicative of the economic aspects of the proposed development than the ratios calculated in the Indian Bureau report.

Subsidy

The total subsidy on the part of the taxpayers and Colorado River storage project power users for the benefit of the 1,100 Indian families, calculated as of the end of the construction and development period or the beginning of project operation, may be conservatively estimated at $266 million, which is the total construction cost plus interest during a 12-year construction period and 10-year development period at 3 percent. The total capital subsidy would thus amount to $2,550 per acre and $242,000 per farm family.

Interest alone at a rate of 3 percent on the $266 million amount of the total subsidy would be $7,980,000 a year. This amount is greater than the total annual benefits estimated in the 1957 report and about three times the direct irrigation benefits indicated in that report. It amounts to $7,300 per farm family per year. Since no interest would be paid by the project beneficiaries on the Federal investment, the total subsidy at the end of 50 years of full operation of the project would amount to approximately $1,200 million, including interest compounded annually at 3 percent a year, and would continue to increase indefinitely thereafter.

Family living allowance

Farm budget analyses in the report assume a family living allowance of $2.250 a year. For this it is proposed to spend Federal funds in the amount of $242,000 per family as indicated above. The same annual living allowance of $2,250 could be provided by the income from an investment of only $45,000 at 5 percent interest. Comparison of this last amount with the $242,000 proposed expenditure manifestly fails to show a net benefit to the nation by the project. On the contrary, it shows a substantial net detriment.

WATER SUPPLY AND USE

Water supply

The 1957 report contains no studies concerning the adequacy of the stream flow of the San Juan River to provide the water supply for the proposed Navajo irrigation project and the proposed transmountain diversion to the Rio Chama in addition to supplying the existing and potential future demands in the San Juan Basin downstream from Navajo Dam site.

Water supply studies in the 1955 report are carried only through the records for the year 1951. The operation studies were for the larger Navajo irrigation project considered in the 1955 report and showed that substantial shortages in water supply would have occurred, including a 46 percent shortage in the last year of the study period, and that active storage would have been exhausted at the end of the period.

Since 1951 there has occurred the most severe 4-year period of low flow of record on the San Juan River. In the period 1953 to 1956, inclusive, the estimated average annual flow was only about half the estimated average for the period 1928–51, and for the 14 years 1943–56 was only about 75 percent of the long-time average.

Inspection of the operation studies in the report and of studies furnished by recent correspondence indicates definitely that the water supply in the basin even with the regulation that could be accomplished with a reservoir at the Navajo site of substantially greater capacity than contemplated in the report would be insufficient to furnish the existing requirements plus the requirements of the Navajo irrigation project, the San Juan-Chama project and the potential industrial uses in the San Juan Basin.

The regional office of the Bureau of Reclamation by letter dated January 21, 1958, states that under present plans the total capacity of Navajo Reservoir would be 1,700,000 acre-feet, as compared with the capacity of 1,450,000 acre-feet proposed when the reservoir was authorized. Studies furnished by the Bureau show the theoretical operation of a reservoir with 1,700,000 acre-feet total initial capacity for a period like 1928 to 1954, inclusive, assuming the San Juan-Chama project developed only to the initial stage. Extended through 1956 by rough estimates, the studies show that in a period such as 1928 to 1956, inclusive, the reservoir, although starting full, would have been drawn down to dead storage in several years including all the last 3 years of the period, and that there would have been annual shortages of 35 or more percent in 4 of the last 6 years for the Navajo irrigation project and the industrial requirements.

With ultimate development of the San Juan-Chama project, the reservoir would have been practically empty for the last 11 or 12 years; substantial annual shortages for the Navajo irrigation project and industrial uses would have occurred in 8 of the last 11 years, with annual shortages of about 50 percent in 4 of the last 6 years. Furthermore, with either initial or ultimate development, the San Juan-Chama diversion for the last 14 years (1943–56) would have averaged only about 75 to 80 percent of requirements.

The entire subject of the adequacy of the water supply for the existing and potential future developments including the two under review should be reopened and thoroughly analyzed on the basis of up-to-date records of streamflow.

Water use

According to the 1957 report, the average annual diversion requirement at Navajo Dam would be 508,000 acre-feet. Net annual depletion is estimated at 282,000 acre-feet, including evaporation losses from the Navajo reservoir, estimated at about 29,000 acre-feet a year average. There is no indication in the reports as to whether the estimate is of depletion at the project site or at some downstream point, but correspondence from the Bureau of Indian Affairs in response to an inquiry states that the estimate indicates depletion at the project site. No details are given either in the reports or in the correspondence as to the derivation of the depletion estimate.

In the 1957 supplemental report, diversion requirements per acre are estimated at 5 acre-feet per annum for gravity lands in the Shiprock division and 4.50 acre-feet per annum for Shiprock division lands served by pumps and for South San Juan division lands. Unit rates of return flows are estimated at 2.5 acre-feet from the Shiprock gravity lands and 2.2 acre-feet from the other lands, indicating an assumption that about 50 percent of the gross diversion would be returned to the river.

Most of the land in the Navajo project is several hundred feet above the elevation of the river and the land in the southern part of the Shiprock division is 20 to 40 miles from the San Juan River. There are no perennial streams connecting this southern area with the river. Large evapotranspiration losses would occur throughout the long drainage return channels. Deep percolation losses would also occur and there is considerable question as to where and when, if ever, such losses would reenter the San Juan River. It appears likely that the estimate of 50 percent average return flow for the Navajo project as a whole is high.

Water rights

The report on the Navajo project proposes the exchange of nonirrigable Navajo Reservation land for equal areas of State and Federal lands and a corresponding change in the reservation boundary. Correspondence of December 19, 1957, from the Bureau of Indian Affairs indicates that the Navajo Tribal Council has elected to purchase the irrigable lands rather than to effect an exchange, and states that it is not possible to provide a figure for the area to be purchased.

This raises a question as to whether the Navajo Tribe can acquire new lands and claim rights as though such new lands were a part of the reservation. The question is of major significance in view of the extensive claims of the United States in the current Supreme Court suit, *Arizona* v. *California* for paramount rights on behalf of the Indians for use of water on Indian reservations. Furthermore, it is not clear whether such acquired lands would be subject either to the act of July 1, 1932 (ch. 369, 47 Stat. 564) or to section 6 of Public Law 485 (70 Stat. 107) as to nonreimbursability of appurtenant costs. If for no other reasons, congressional consideration of authorization of the Navajo irrigation project should be delayed pending determination of these questions.

II. San Juan-Chama Project

ECONOMIC ASPECTS

Unless otherwise stated, the analyses and comments herein apply to the proposed initial stage development of the project. Cost figures in the 1955 report for the ultimate development are out of date. The 1957 report mentions possible modifications and savings in construction costs in the plan for ultimate deveolpment described in the 1955 report. It also refers, however, to an increase of about 10 percent in construction prices since the price base date of the 1955 report.

The 1957 report contains a few figures relating to the ultimate development but the figures are not fully defined. They are unclear in relation to each other or to the figures in the 1955 report. They involve unexplained changes in the cost of operation, maintenance and replacement and in the Colorado River storage project charge. The figures are too few and confusing to permit full analysis.

Navajo Dam and Reservoir

The 1957 supplemental report states that because the Navajo Reservoir on the San Juan River is authorized for construction as an initial unit of the Colorado River storage project, no portion of the costs of that reservoir would be chargeable to the San Juan-Chama project. However, the 1955 report indicates the need of storage capacity at the Navajo site in order to regulate the flow of the San Juan River so that the proposed diversion to the Rio Chama could be accomplished without interference with water rights in the San Juan Basin. In that report, $800,000 of the cost of the Navajo Reservoir is included in the cost of the diversion project. In the analyses herein, the $800,000 is included as it properly should be in any appraisal of the financial and economic worth of the San Juan-Chama diversion project.

Cost of project

Estimated construction cost of the initial stage including the $800,000 for Navajo Dam is $81,869,000. Based upon a tabulation in the report, and prorating the additional $800,000 between irrigation and municipal water supply, the allocation among the different functions would be—

	Initial stage
Irrigation	[1] $50, 832, 000
Municipal	[1] 27, 877, 000
Recreation	360, 000
Deferred to future uses	2, 800, 000
Total	81, 869, 000

[1] $800,000 of cost of Navajo Dam apportioned between irrigation and municipal in same proportion as other costs in 1957 report.

The $2,800,000 in the report and in the above tabulation "deferred to future uses" is stated to be the construction cost involved in providing excess capacity in the initial stage development to permit later project expansion. This indicates a serious intent to seek authorization at a future time for the full-scale development. It implies an obligation on the part of the Congress for future authorization of the project expansion and explains the suggestion in the report that the ultimate development be given congressional approval at this time.

There are not enough data given in the reports to permit analyses of the adequacy of engineering design, quantities of materials, unit prices, and the resulting construction cost estimates. However, the 1955 report states that many of the data are the result of reconnaissance investigations, and indicates the need for considerably more surveys, studies, and design before construction. It should be borne in mind also that, in view of past experience on reclamation projects, the final construction cost might well prove to exceed the estimates by a considerable percentage.

Irrigation construction costs

The construction cost of the initial stage allocated to irrigation as in the above tabulation breaks down into the following figures per acre and per average size farm.

Initial stage

	Tributary units	Middle Rio Grande Conservancy District
Irrigation construction cost	$35, 900, 000	$14, 932, 000
Irrigated acreage	39, 330	81, 610
Construction cost per acre	[1] $913	[1] $183
Cost per 60-acre farm	$55, 000	$11, 000
Cost per 100-acre farm	$91, 000	$18, 000

[1] Weighted average for entire initial stage, $420 per acre.

These costs are those proposed for the purpose of providing a supplemental irrigation water supply that would amount to only a minor part of the full requirements.

The figures above do not include the $2,800,000 allocated to future uses. Since the municipal and industrial water supply would be fully developed in the initial stage, the excess capacity covered by the $2,800,000 would be wholly for irrigation and since there is no real assurance that the project will ultimately be expanded, the $2,800,000 might properly be allocated to irrigation in the initial stage. Addition of that amount would increase the weighted average irrigation construction costs to about $445 an acre.

For the ultimate development it is inferred from figures and statements in the 1957 report that the total estimated construction cost would be about the same or slightly higher than the amount shown in the 1955 report. Using the cost estimates in the 1955 report and the total acreage reduced slightly as indi-

cated in the 1957 report, the unit construction costs attributable to irrigation in the ultimate development would appear to be approximately as follows:

Ultimate stage

	Tributary units	Middle Rio Grande and Elephant Butte
Irrigation construction cost	$41,035,000	$66,889,000
Irrigated acreage	43,975	180,310
Construction cost per acre	[1] $933	[1] $371
Per 60-acre farm	$56,000	$22,000
Per 100-acre farm	$93,000	$37,000

[1] Weighted average for entire ultimate development $481 an acre.

In the above tabulation the estimated ultimate irrigation construction cost for the Middle Rio Grande and Elephant Butte areas included a figure of $20,393,000, which in the 1955 report was allocated to "basin depletions." However, since that report indicates that "water allocated to replacement of basin depletions will be devoted to irrigation use," it is considered proper to include the $20,393,000 in the irrigation allocation of the ultimate development in order to reflect the true cost involved. The 1955 report indicates also that all the replacement would take place in the Middle Rio Grande Valley.

The costs per acre and per farm in the preceding table demonstrate that the uneconomic aspects of the irrigation portion of the project would not be improved by the ultimate stage development.

Further illumination of the economic aspects of the initial stage is gained by separating out the estimated irrigation costs according to the different units:

Initial stage

Unit	Acres	Construction cost	Cost per acre
Cerro	11,820	$11,117,000	$941
Taos	20,550	16,764,000	816
Llano	4,520	5,588,000	1,236
Pojoaque	2,440	2,431,000	996
Middle Rio Grande division	81,610	14,932,000	183
Total or average	120,940	50,832,000	420

These costs are proposed to be spent in construction of facilities to provide project lands with only the small quantities of water per acre shown below, as compiled from statements in the report.

Initial stage

Unit	Full water requirement (acre-feet per acre-year)	Project water delivery	
		(Acre-feet per acre-year)	Percent of requirement
Cerro	2.24	0.78	35
Taos	2.46	.56	23
Llano	3.77	1.35	36
Pojoaque	2.72	.29	11
Middle Rio Grande	2.03	.24	12
Weighted average	2.19	.39	18

If the costs of construction allocated to irrigation are reduced to costs per acre of land that could be furnished a full water supply under the proposed initial development, the results are even more startling as shown by the following tabulation, with an overall average cost of $2,500 per equivalent acre.

Initial stage

Unit	Cost	Full diversion requirement (acre-feet per acre-year)	Project demand at point of use (acre-feet per year)	Equivalent full supply acreage	Cost per equivalent acre
Cerro	$11, 117, 000	2. 24	9. 200	4, 110	$2, 700
Taos	16, 764, 000	2. 46	11, 400	4, 630	3, 600
Llano	5, 588, 000	3. 77	6, 100	1, 620	3, 450
Pojoaque	2, 431, 000	2. 72	700	260	9, 350
Middle Rio Grande Conservancy District	14, 932, 000	2. 03	19, 500	9, 610	1, 550
Total or average	50, 832, 000			20, 230	2, 500

Figures for diversion requirements in the above two tabulations are taken directly from the report and are said to represent onsite requirements for full supplies. No detail is given as to how the figures were derived, hence they cannot be analyzed. However, in general they appear too small, especially when compared with each other and with the consumptive use estimates in the report. A striking example of apparent inconsistency is the Middle Rio Grande unit, for which the estimate of diversion requirement is even smaller than the estimated consumptive use requirement per acre. If the figures for diversion requirements are too small, the calculated percentages of full water requirements that would be furnished by the project and the calculated equivalent acreages are too large, and the costs per equivalent acre too small.

Cost of water, initial stage

The initial stage of the project would supply 46,900 acre-feet a year of supplemental irrigation water. For full repayment of irrigation construction cost in 50 years without interest and payment of operation, maintenance, and replacement costs, an average onsite water rate of $27.25 per acre-foot would be required. Real cost to the Federal Government, including interest at 3 percent, would be $53.30 an acre-foot, as compared with a proposed payment by the water users of about $9 an acre-foot, including $5.60 operation and maintenance charges.

For municipal and industrial water supply the project would deliver 50,000 acre-feet a year. Cost of operation, maintenance, and replacement, and of amortizing the allocated construction cost in 50 years at 2½ percent interest, is calculated in the report at $21.75 an acre-foot, which is also the proposed repayment rate. The calculation assumes a 4-year construction period. At the more realistic interest rate of 3 percent and with an 8-year construction period the cost would be $25.85 an acre-foot.

Land values

The report contains no estimates of the market value of improved farmlands in the project area. Figures in the farm budget analyses in the 1955 volume indicate anticipated farm investments, presumably including land, improvements, equipment, and livestock, ranging from $130 an acre in the Cerro unit to about $300 an acre in the Middle Rio Grande Conservancy District. Comparison of these figures with the average project construction costs per acre tabulated above shows directly and decisively that the cost of the proposed diversion from the San Juan River would be a poor national investment.

Repayment of costs

The 1957 supplemental report proposes that costs assigned to municipal and industrial water supply be repaid in 50 years with interest at 2½ percent, including interest during construction, and that the cost assigned to irrigation be repaid in 50 years without interest, partly by the water users and partly by the Upper Colorado River Basin fund. It is estimated in the report that the irrigators in 50 years could repay about $8 million of the construction cost of the initial stage, or about 16 percent of the irrigation allocation. The amounts

of construction cost proposed to be repaid from the different sources of funds are therefore as follows:

Repayment of reimbursable construction cost (initial stage)

	Amount	Percent reimbursable cost
Payment by—		
Upper Colorado River Basin fund	[1] $45,905,000	56
Irrigation	8,010,000	10
Municipal and industrial water	27,594,000	34
Total	[2] 81,509,000	100

[1] Including $800,000 of cost of Navajo Dam.
[2] Excluding $360,000 allocated to recreation, nonreimbursable.

No detailed payout study for the initial development is given in the reports. No showing is made as to when or how the portion of the cost assigned for repayment from Colorado River storage project power revenues would be repaid.

Other irrigation developments already authorized as upper basin "participating projects" will impose large demands upon the upper basin fund for their required subsidies. Information submitted to date fails to demonstrate that even those demands can be met in accordance with the provisions of the Storage Project Act, Public Law 485, 84th Congress. The addition of $46 million by the initial stage San Juan-Chama project to the total amount of subsidy needed from the storage project power revenues would cast still more doubt as to the changes of meeting the repayment provisions.

It appears highly probable therefore that payment of the San Juan-Chama construction cost assigned for repayment from the power revenue fund would be deferred for at least 50 years, during which the interest cost to the national taxpayers would accrue to such extent that the total investment would be several times the initial cost. At 3 percent compound interest, the $45,905,000 initial stage construction cost assigned for repayment from power revenues would accumulate to $200 million at the end of 50 years.

Repayment by irrigators

As shown above, the estimated ability of the irrigation water users to repay initial stage construction cost in 50 years amounts to only 16 percent of the cost allocated to irrigation and 10 percent of the total estimated project construction cost. In addition, the irrigators would be expected to pay the operation, maintenance, and replacement cost assigned to irrigation. The resulting total payment would average about $3.50 per acre per year, as compared with an estimated direct benefit of $10.50 per acre per year. The irrigators would pay about $9 per acre-foot for water delivered to site of use as compared with an estimated total Federal cost of $53.30 for operation, maintenance, and amortization computed on a borrowing rate of 3 percent which is considered ultraconservative.

The ability of the irrigation farmers to repay even this small part the cost of the project would depend upon costs of present water supplies, suitability and productivity of the lands, the efficiency of farm operation and management and the relative level of future agricultural economy as well as other factors.

Classification of the lands in the initial stage project area is not given in the 1957 report, but lands in the ultimate stage development are classified in the 1955 report as follows: Tributary units 7 percent class 1, 92 percent class 2, and 1 percent class 3: Middle Rio Grande unit 85 percent classes 1, 2, and 3, 15 percent classes 4S and 4H. Detailed land classification surveys were made only of the Middle Rio Grande unit. The land classification for the tributary units was made by reconnaissance only and no classification was made for the area below Elephant Butte Dam.

There are insufficient data in the reports to permit analysis of the farm budget studies, and of course forecasts as to agricultural economy levels are matters of considerable speculation.

Land within the project area is mostly divided into small noncommercial farms which are not self-supporting. On the relatively few commercial farms, the principal crops are alfalfa, fruits, and vegetables and there is some dairying.

The report states that most of the land holdings in the tributary units are too small to provide family living and furthermore, that the farming methods employed are, in general, not modern. Development of these tributary units under such conditions would encourage people to continue submarginal farming.

Estimates in the report of the future economy level and the capacity of the lands to pay project costs are based upon the anticipation that the small uneconomic holdings would be combined into larger farms which would, according to the Reclamation Bureau, tend to stabilize and improve the economy and would improve rates of crop production. There can be only speculation as to how strong the trend toward consolidation would be, and even if it should develop into an important factor, the heavy subsidization per acre, which cannot be justified on any grounds, would directly benefit only a few people at the expense of many.

Municipal repayment

The required rate for municipal and industrial water to comply with the proposed method of repayment is calculated in the report at $21.75 per acre-foot of water delivered to the channel of the Rio Chama. No facilities would be provided for delivering the water to the city of Albuquerque, which according to the report would be the sole user of such water.

Because of the unreality of the 2½-percent interest rate, the proposed payment by municipal and industrial water users would not actually cover the real cost to the Federal Government of providing the water supply. As discussed above, the cost at the minimum borrowing rate for Federal funds in recent years, with the same estimated construction cost allocated, would be about $25.85 per acre-foot. Such cost, amounting to about 8 cents per thousand gallons, is considered moderate in comparison with costs in other localities. It should be well within the ability of the municipal and industrial water users to repay if there is a real need for the incremental supply.

Benefit-cost analyses

Benefit-cost ratios for the initial stage of the project are estimated by the Bureau of Reclamation in the 1957 report for 100-year and 50-year periods of analysis as follows, both using an interest rate of 2½ percent for the computation of annual cost:

U.S. Bureau of Reclamation benefit-cost ratios (initial stage)

	100 years		50 years	
	Total benefits	Direct benefits	Total benefits	Direct benefits
Municipal and industrial water	1.05	1.05	1.09	1.09
Tributary irrigation units	1.12	.74	.89	.58
Middle Rio Grande Conservancy District	1.33	.81	1.07	.65
Recreation	2.00	2.00	2.00	2.00
Future uses	1.00	1.00	1.00	1.00
Overall initial stage	1.15	.88	1.00	.79

For irrigation only, the total benefits in the initial development are estimated at $2,019,000 a year, or five times the estimated annual payment capacity of about $398,000 including operation and maintenance costs. The direct irrigation benefits alone are estimated by the Bureau at $1,296,000 a year, or 325 percent of the payment capacity. It would seem that the payment capacity should be more nearly equal to the direct irrigation benefit.

The estimate of municipal and industrial water supply benefits is said to be based upon the estimated cost of an equivalent supply from the cheapest alternative source. Annual benefits as estimated in the 1955 report on the basis of private financing of the alternative project amount to about $38 an acre-foot, but the estimate is reduced in the 1957 report to about $24 an acre-foot, partly by assuming Federal financing of the alternative project instead of private, and partly for reasons not apparent.

Recreational benefits are stated by the National Park Service to be estimated on a "broad conjectural basis," and the annual recreational benefits are evaluated in the report at exactly twice the estimated annual cost. According to

this approach, if the costs of recreation facilities proved for any reason to be double the estimates in the report, the estimates of annual benefits would have to be four times the original cost estimate in order to retain the same ratio. The absurdity is obvious. The estimated annual recreation benefit is only a small percentage of the estimated total benefits but the arbitrary assumption in the report of a 2-to-1 ratio for recreation does help to a minor extent in indicating therein a favorable ratio for the overall project.

Revised benefit-cost ratios

No consideration is given in the report to the national detriment from the reduction of hydroelectric energy generation at downstream plants in the Colorado River Basin that would result from the additional diversion proposed in the San Juan-Chama project. Deducting the value of the lost energy, roughly estimated at $500,000 for the proposed diversion of 110,000 acre-feet a year, would reduce the total annual project benefits for the initial stage from $3,110,000 to $2,610,000 in the 100-year analysis and from $3,361,000 to $2,861,000 in the 50-year analysis, assuming the Reclamation Bureau estimates of benefits were otherwise acceptable. This correction alone would reduce the Bureau estimates of benefit-cost ratios to 0.96 to 1 for the 100-year analysis and 0.85 to 1 for the 50-year analysis, or less than unity for both periods.

The Reclamation Bureau assumes a 4-year construction period for the initial development with a maximum estimated allotment of nearly $35 million in the third year, and $24 million in the last year. This appears overoptimistic in view of past experience on appropriations and the large backlog of projects which will compete for appropriations within an overall limit. Furthermore, the present trend to reduce appropriations for such activities as reclamation in favor of larger expenditures for national defense may continue for many years. It is believed that a construction period of about 8 years would be more realistic.

Finally, after making the adjustments for the reduction in power generation and lengthening the construction period, and with the interest rate increased to 3 percent, the benefit-cost ratios for the initial stage on a 50-year period of analysis are calculated as follows:

Direct benefits to cost	0.67–1
Total benefits to cost	.71–1

These ratios are more indicative of the economic aspects of the development as proposed in the report than the ratios calculated by the Reclamation Bureau.

Irrigation subsidy

The total capital subsidy to irrigation in the initial project including allocation to future uses, on the part of the taxpayers of the Nation and the potential power users of the Colorado River storage project for benefit of the relatively few, computed on the conservative bases of a 3 percent interest rate and an 8-year construction period with no allowance for any development period, is as follows:

Construction cost including interest during construction	$60,800,000
Less the present worth of annual payment by irrigators of $160,200 for 50 years	4,100,000
Capital subsidy of irrigation	56,700,000

The total capital subsidy to irrigation for the initial stage would thus amount to $470 per acre of land for a supplemental water supply of only 0.4 acre-foot a year average, and $2,800 per equivalent acre of land on a full water supply basis. Interest alone on the amount of the total irrigation subsidy would be $1,700,000 a year at the 3 percent minimum borrowing rate. This amount is 25 percent greater than the annual direct benefits for irrigation shown in the 1957 report and is 80 percent of the total annual benefits shown therein.

The amount of the subsidy compounded to the end of 50 years of full project operation would increase to $250 million at an interest rate of 3 percent. This amount may be termed the increase in the national debt at the end of 50 years, and would continue to increase indefinitely beyond 50 years.

Although the report does not set up a development period for irrigation, correspondence from the regional director, Bureau of Reclamation, states that 10-year development periods are contemplated for some of the tributary units. In view of that statement, the subsidy figures above should be increased to allow for interest costs to the Federal Government during such development periods.

However, the information and estimates available are insufficient for the additional calculations that would be necessary.

Summary

The multiple-purpose project as proposed in the report is not economically justified and probably not financially feasible within the terms of the Colorado River Storage Project Act. Benefit-cost ratios are less than unity for the irrigation features of the initial stage, and the construction costs for supplemental irrigation in both the initial and ultimate developments would greatly exceed the value of land with full water supplies.

A single-purpose project to provide municipal and industrial water might be justified and probably could be fully financed by the local project beneficiaries. By examination of the water supply studies in the report, it is concluded that no storage at the Navajo site on San Juan River would be needed in connection with such a project.

WATER SUPPLY AND USE

Water supply

Water supply studies referred to in the 1955 report are said to show a sufficient surplus of flow in the San Juan River at the proposed diversion points to supply the ultimate San Juan-Chama diversion of 235,000 acre-feet a year, with sufficient bypass allowances for downstream requirements in the San Juan Basin. However, the studies are carried only through the year 1951. Since that year, there have been several years of extremely low flow in the San Juan River, which should be investigated.

For the initial stage, studies in the 1957 report were carried through the year 1955 for the operation of Heron No. 4 Reservoir, proposed for regulation of the diverted water. They showed that the reservoir would have been empty at the end of 1955 and that there would have been a shortage of 9.3 percent in the delivery of water that year. The water year 1956 was one of extremely low runoff, and coming with an empty reservoir probably would have resulted in much greater shortage of water. Additional studies are needed and should be made by the Bureau as to engineering feasibility of the proposed project with respect to water supply.

The studies in the 1955 report indicate that the proposed diversions from the San Juan River to the Rio Chama apparently would vary from year to year, ranging from about one-third to about twice the contemplated ultimate average of 235,000 acre-feet. Such possible variations must be taken into account in conjunction with possible annual variations in other transmountain diversions from the upper basin and in existing and future consumptive uses of water within the basin. It is the California contention that under the Colorado River compact the total consumptive uses resulting from all diversions in the upper basin shall not exceed 7,500,000 acre-feet in any one year.

Water quality

The report contains almost no discussion or mention of the problem of the chemical quality of the Colorado River water and the potential effects of the proposed transmountain diversion upon the quality of the Colorado River water downstream. California interprets article VIII of the Colorado River compact to mean that present perfected rights shall not be impaired either in quantity or in quality of the water. It would seem that diversion of relatively pure water from the upper reaches of the San Juan Basin would unavoidably have some detrimental effect upon the quality of the water remaining in the Colorado River system to flow into the lower basin. Consideration must be given to the incremental effect of this project in conjunction with other transmountain diversion projects, existing or proposed, in the upper basin.

However, this question cannot be conclusively answered in the absence of a comprehensive investigation and report upon the natural quality of the water in the basin and the qualitative effects of all present, contemplated, and possible future developments for both transmountain and inbasin water uses. Such study and report should be completed before further consideration is given to projects proposing substantial diversions from the basin such as the proposed San Juan-Chama development.

Because of the lack of a comprehensive analysis of the water quality problems and because of the likelihood that large transmountain diversions from the headwaters would worsen the quality of the downstream supply in the Colorado River Basin, a reasonable limitation on such diversions should be guaranteed. Any legislative proposal for transmountain diversion from the

Colorado River system should contain a requirement that the State within which the diverted water would be used agrees, by act of its legislature, to a reasonable upper limit upon the annual aggregate of all such diversions for use within such State.

Violation of Colorado River compact

The project planning reports under review and the investigations described therein are said to be based upon criteria set up by the State of New Mexico, including the statement that "Diversions of water by this project shall be made only for beneficial use, and shall be subject to the terms of the Colorado River compact and the upper Colorado River compact." Nevertheless, examination of the reports indicates the expressed or implied intent to use diverted San Juan River water in a manner that in the opinion of California might be in violation of the Colorado River compact. Uses of water under the Colorado River compact are restricted to the States of the Colorado River Basin as set forth in articles II(f) and III(a) of the compact:

"ARTICLE II

"(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 water diverted from the System above Lee Ferry." [Emphasis added.]

"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 * * *." [Emphasis added.]

Further, the Upper Colorado River Basin compact opens with a statement reading in part as follows:

"[The states] * * * have agreed, subject to the provisions of the Colorado River Compact, to determine *the rights and obligations of each signatory state* respecting the uses and deliveries of the water of the Upper Basin of the Colorado River * * *" [Emphasis added.]

However, section 2 of the Colorado River Storage Project Act, Public Law 485, 84th Congress, 2d session, provides that "with reference to the plans and specifications for the San Juan-Chama project, the storage for control and regulation of water imported from the San Juan River shall * * * (3) be operated at all times * * * in strict compliance with the Rio Grande Compact as administered by the Rio Grande Compact Commission * * *"

This latter provision introduces the possibility of conflicting purposes as between compliance with the Colorado River compact and compliance with the Rio Grande compact.

New Mexico has incurred a substantial debit in the delivery of water to Texas under the operation of the Rio Grande compact, as evidenced by the action brought by Texas in *Texas* v. *New Mexico*, No. 9 original, Supreme Court of the United States. In that litigation Texas sought to restrain New Mexico from storing waters of the Rio Grande and its tributaries except as provided in the Rio Grande compact, and to restrain New Mexico from diverting and using waters of the Rio Grande allocated to Texas by that compact; and to require New Mexico to make water available to Texas in accordance with the compact. The Supreme Court dismissed the action in 1957, holding the United States to be an indispensable party in behalf of Indians, but the issues involved remain to be settled.

The report contains a recommendation by the Elephant Butte Irrigation District that water imported from the San Juan Basin should first be applied to a reduction of the New Mexico debit on the Rio Grande, and that such arrangement have permanent application. Allocation in the 1957 supplemental report of $2,800,000 to deferred future uses indicates a strong intent for future expansion of the initial development and implies an obligation for congressional authorization of the ultimate development. The ultimate plan includes an assignment of a substantial quantity of the imported water to the Elephant Butte Irrigation District which extends downstream from the Elephant Butte Dam to the Texas border. If the proposed diversion from the San Juan River were to result in more water passing beyond the boundaries of New Mexico than

would occur in the absence of such diversion, the provisions of the Colorado River compact would be violated.

In view of the possibility of such occurrence, and in view of the seeming conflict between the Colorado River compact and section 2 of the Colorado River Storage Project Act, any legislation proposing to authorize transmountain diversion of Colorado River system water to the Rio Grande Basin for whatever purpose, should contain provisions as follows:

"None of the waters of the Colorado River system shall be exported from the natural basin of that system by means of works constructed under authority of this Act, or extensions and enlargement of such works, to the Rio Grande Basin for consumptive use outside of the State of New Mexico, and no such waters shall be made available for consumptive use in any State not a party to the Colorado River Compact by exchange or substitution or by use of return flow; nor shall the obligations of the State of New Mexico under the provisions of the Rio Grande Compact be altered by any operations of any project for transmountain diversion of Colorado River system water into the Rio Grande Basin."

COLORADO RIVER BOARD OF CALIFORNIA,
By /s/ RAYMOND MATTHEW, *Chief Engineer.*

STATEMENT OF RAYMOND MATTHEW, CHIEF ENGINEER, COLORADO RIVER BOARD OF CALIFORNIA, LOS ANGELES, CALIF., RE S. 3648, JULY, 1958, BEFORE SENATE SUBCOMMITTEE ON IRRIGATION AND RECLAMATION

My name is Raymond Matthew. I am chief engineer of the Colorado River Board of California. The board was created by an act of the California Legislature with the express duty and responsibility of protecting and preserving the rights and interests of California, its agencies and citizens in the waters of the Colorado River system.

California agencies have rights established by prior appropriation and by contract with the Secretary of the Interior under the authority of the Boulder Canyon Project Act, providing for the use in California of 5,362,000 acre-feet annually of water from the Colorado River system. They have invested more than $700 million in projects already constructed and in operation for diversion and use of Colorado River water. It is the duty of the State to protect and preserve those rights and investments of its citizens.

Therefore, California is rightfully concerned in any proposals for the further development of the water resources of the Colorado River Basin. It is necessary for the State to analyze thoroughly any such proposals and to take whatever steps appear required to insure that rights of California and its agencies in and to the waters of the Colorado River system shall not be impaired.

Position of the Colorado River Board of California. The fundamental position of the Colorado River Board regarding the development of the water resources of the Colorado River Basin is that such development should be planned from a basinwide standpoint and that only those projects should be authorized which, together with others existing, proposed, or contemplated will best serve the broad interests of the basin. To this end it is believed that each proposal should be sound economically and engineeringwise and should assure the best overall use of water resources and the greatest benefit to the general economy. In a region as short of water as the Colorado River Basin extra care must be taken to secure the ultimate development that would be of optimum benefit.

The Colorado River Board is in favor of the development of the water resources of the Upper Colorado River Basin within the limits of the legal rights of the upper basin, provided such development is made upon sound engineering and economic bases, is made only as needed and will not impair the rights of the lower basin; but the board strongly believes that such upper basin development should also conform to an overall pattern that is best for the basin as a whole.

Based upon a careful review and analysis of the planning reports, the Colorado River Board considers that the Navajo Indian irrigation project and the San Juan-Chama diversion project proposed for authorization in the pending bill S. 3648 fail to meet the foregoing fundamental criteria as respects (1) water supply and use affecting engineering feasibility and (2) financial feasibility and economic justification. Accordingly, it is the board's position that neither the Navajo project nor the San Juan-Chama project as proposed in the reports should be authorized by the Congress as Federal undertakings.

WATER SUPPLY AND USE—NEW MEXICO'S ENTITLEMENT

There is serious question whether the New Mexico entitlement to water under the Colorado River compact would amount to enough on the average to supply the estimated requirements of both the proposed Navajo Indian project and the contemplated ultimate development of the San Juan-Chama project, in addition to the requirements of other New Mexico projects, existing and authorized, for use of Colorado River system water.

The report by Raymond A. Hill, consulting engineer, made to the Colorado Water Conservation Board in October 1953 (printed as S. Doc. 23, 84th Cong., 1st sess.) concludes that the aggregate possible depletion in the upper basin may be no more than 6,200,000 acre-feet per year.

A few days ago at the trial in San Francisco of *Arizona* v. *California, et al.*, testimony was presented by a witness for the State of Arizona, Mr. John R. Erickson, who was formerly State engineer of New Mexico, by way of rebuttal for Arizona in regard to the water supply of the Colorado River. Accompanying his testimony were several exhibits. I have here five of the exhibits which set forth Mr. Erickson's estimates of water supply and the bases upon which the estimates were made including exhibits 358 to 361, inclusive, and exhibit 366.

(The exihibits referred to appear later in Mr. Matthew's testimony.)

Mr. MATTHEW. Exhibit 358 presents an estimate of the release from the upper basin for the Mexican treaty obligation under Arizona's assumptions relating thereto. The assumptions appear on page 3 of exhibit 358. Attorneys for the State of Arizona made it clear that the assumptions in regard to the Mexican treaty obligation were given to Mr. Erickson by the Arizona attorneys as being in accord with Arizona's interpretation ofthe compact with respect to the upper division's obligations to supply water to service the Mexican water treaty, and that Mr. Erickson's computations were based upon such legal interpretations. The exhibit shows an upper basin obligation, averaging for the years 1909 to 1956, 1,280,000 acre-feet per year, to be added to the upper division's obligation under article III(d) of the compact.

Exhibit 359 presents an analysis of the operation of upper basin storage based upon the assumption: "With 25 million acre-feet effective storage; 5,700,000 acre-feet annual depletion at Lee Ferry; 75 million acre-feet releases per 10-year period to lower basin, plus spills; and, releases for Mexican treaty obligation, 1909–56."

The significance of 25 million acre-feet is that it is the equivalent of all the holdover capacity (active) in the upper basin, in terms of effect at Lee Ferry, that is, it reflects the active storage capacity which will be available when Glen Canyon, Flaming Gorge, Curecanti, and Navajo Dams are built.

Exhibit 360, on the same assumptions, shows net inflow to Lake Mead. The average shown on page 2 is 10,458,000 acre-feet, of which 2 components are supplied by the upper basin: Column 2, 8,231,000 acre-feet, which is "annual flow at Lee Ferry, to supply 75 million acre-feet in 10 years, plus spills"; and column 3, "releases at Lee Ferry for the Mexican treaty obligation," which is 1,280,000 acre-feet.

These two components aggregate 9,511,000 acre-feet. The remaining component is: Column 4, the estimated historic net gain Lee Ferry to Hoover Dam, which is 947,000 acre-feet per year. In other words, the upper basin is required to release 9,511,000 acre-feet on the average, although able to deplete at Lee Ferry only 5,700,000 acre-feet for its own use, including reservoir losses.

Exhibit 361, on the same assumptions, shows the "operating characteristics of Lake Mead." If the average inflow is 10,458,000 acre-feet (as transferred from exhibit 360), the sustained annual release will be 9,600,000, on an average, plus 337,000 acre-feet of spill.

Exhibit 366 presents a summary of water supply available on long-term basis from main stream of Colorado River in lower basin on basis of 35 million acre-feet, upper basin effective storage.

No detailed operation studies were presented by Mr. Erickson for the 35 million acre-feet assumed storage capacity in the upper basin. However, it will be noted that under this assumption the upper basin would have available for use in terms of depletion at Lee Ferry, 6,200,000 acre-feet annually, including main stem reservoir evaporation losses. It is desired to make clear again that the figures in these exhibits represent Arizona's assumptions and interpretations of the operation of the Colorado River compact, since the testimony was

presented by an Arizon witness and stated to be based upon assumptions made by legal counsel of the State of Arizona.

These estimates indicate that the net water supply, after deducting main-stem reservoir evaporation losses available for use in the upper basin for participating projects, may not be more than 5 million to 5,500,000 acre-feet a year on the average. New Mexico's share, 11.25 percent of a median of those amounts would be about 600,000 acre-feet a year average.

Present and authorized projects in the San Juan River Basin in New Mexico require an estimated 120,000 acre-feet a year, leaving 480,000 acre-feet for future developments. The estimated total net annual requirements of the Navajo Indian project and the ultimate phase of the San Juan-Chama project combined is 520,000 acre-feet a year. Thus, the indicated deficit is 40,000 acre-feet a year. This indicated deficit would be increased an additional 75,000 to 100,000 acre-feet using a more realistic figure for depletion by the Navajo project as referred to hereafter.

Assuming only the initial phase of the San Juan-Chama project, there would be an indicated surplus of 90,000 acre-feet a year. However, in our opinion the net use of water on the Navajo Indian project would be 75,000 to 100,000 acre-feet a year more than estimated in the planning report. Some 50,000 acres of the project service area lie 20 to 40 miles from the San Juan River and it is highly questionable if there would be much if any return flow therefrom to the river. Furthermore, the foregoing analysis makes no provision for future domestic and industrial water requirements in the San Juan Basin of New Mexico, which it is understood have been estimated at 225,000 acre-feet a year It appears evident that further consideration should be given to the question of availability of water supply under New Mexico's entitlement to Colorado River systems water under the compacts, before embarking on these proposed projects.

ADEQUACY OF WATER SUPPLY

It also is questionable whether the longtime average flow physically available in the San Juan River is sufficient, with the contemplated amount of storage regulation at the Navajo Reservoir site, to supply the water requirements of existing and authorized developments in the San Juan Basin, plus the additional requirements of the Navajo Indian project and the San Juan-Chama diversion project. The water supply and reservoir operation studies for Navajo reservoir in the Interior Department report were carried only through the period 1928 to 1951, inclusive.

Since 1951 there has occurred the most severe 4-year period of low flow of record on the San Juan River. In the period, 1953 to 1956, inclusive, the estimated average flow was only about half the estimated average for the period 1928–51; and for the 14 years, 1943 to 1956, inclusive, was only about 75 percent of the average for the longtime period.

Inspection of the operation studies in the report, and supplemental data made available by the Bureau, indicates that the water supply in the basin even with the regulation that could be accomplished at the Navajo Reservoir site would be insufficient to furnish the existing requirements, the requirements of the projects contemplated in the pending legislation and the potential industrial uses in the San Juan Basin. Extension of the operation studies through the year 1956, using annual streamflow data, shows that with all the existing and proposed future demands upon the Navajo Reservoir, including the Navajo Indian project and the initial stage of the San Juan-Chama project, there would have been substantial water shortages in many years between 1945 and 1956, and that the reservoir would have been empty (that this, drawn down to dead storage level) for 4 of those 11 years, including 3 consecutive years. With the ultimate development of the San Juan-Chama project the reservoir would have been substantially empty for the last 11 years; severe shortages would have occurred in 8 of the last 11 years.

The contracting provisions of section 7 of S. 3648 anticipate shortages in water supply which would necessitate arrangements for sharing of shortages and limiting contract commitments. It is submitted, however, that the occurrence and amount of water shortages indicated by the water supply studies are so severe as to present a most unhealthy prospect for successful operation of the proposed projects. The indicated inadequacy of the water supply casts grave doubt on the engineering feasibility of the proposed undertakings.

The entire subject of the adequacy of the water supply for existing and potential future developments in the San Juan River Basin should be more

thoroughly studied and more fully analyzed before consideration is given to development of the proposed projects, particularly in view of the high costs of the undertakings.

In the light of the foregoing questions as to availability and adequacy of water supply, it appears evident that any idea of giving advance approval to or adopting the plan for the "ultimate" stage of the San Juan-Chama project would be most unrealistic and permature at this time.

NAVAJO INDIAN WATER RIGHTS

Since an exchange of lands or an expansion of the Navajo Indian Reservation is contemplated or implied in the report, the question of the limit to which the Indians' water rights can be extended poses a serious problem. The entire question of Indian rights is one of the issues in the current U.S. Supreme Court suit, *Arizona* v. *California, et al.*, and this issue at least should be resolved before additional Indian irrigation projects are authorized.

QUALITY OF WATER

There is no treatment in the report of the possible effect of either the Navajo or the San Juan-Chama project upon the chemical quality of the waters of the Colorado River system. Such possible effect is also an important question in the interpretation and the administration of the Colorado River compact. The problem as to quality of water involves all projects, existing and proposed, in the basin. More data and much additional study are needed on this problem, which is deemed to be one of the most serious matters requiring solution. In this connection the Colorado River board deems it essential that there be a definite limit set on transmountain diversions.

SAN JUAN-CHAMA PROJECT DIVERSION

Information in the report on the San Juan-Chama project indicates a contemplated variation of the proposed transmountain diversion from year to year, ranging from about one-third to about twice the estimated ultimate average of 235,000 acre-feet. Such possible variations must be taken into account in conjunction with possible annual variations in other diversions and uses in the upper basin, all as pertaining to the rights of the respective States. Such consideration is not apparent in the Reclamation Bureau report which is thus incomplete in this important aspect and does not constitute a proper guide to the Congress and the affected States. The diversion should be clearly defined by appropriate limitations giving due recognition to downstream water rights and requirements.

POSSIBLE VIOLATION OF COLORADO RIVER COMPACT

Examination of the San Juan-Chama report indicates the expressed or implied intent to use diverted water of the San Juan River in a manner that might be a violation of the Colorado River compact. Uses of water under the Colorado River compact are restricted to the States of the Colorado River Basin by the terms of the compact.

On the other hand, section 2 of the Colorado River Storage Project Act (Public Law 485, 84th Cong.), provides that water diverted from the San Juan River to the Rio Chama shall be handled at all times in strict compliance with the Rio Grande compact: Thus, there is introduced the possibility of conflicting purposes as between compliance with the Colorado River compact and compliance with the Rio Grande compact.

New Mexico has incurred a substantial deficit in the delivery of water to Texas under the operation of the Rio Grande compact. The report on the San Juan-Chama project contains a recommendation by the Elephant Butte Irrigation District that water imported from the San Juan Basin be first applied to reduction of the deficit and that such arrangement have permanent application.

If the proposed diversion from the San Juan River were to result in more water passing beyond the boundaries of New Mexico than would occur in the absence of such diversion, the provisions of the Colorado River compact would be violated.

The chief concern of the Colorado River board in the proposed project lies in the foregoing questions with respect to water supply and use. However, in reviewing the planning reports, an analysis also has been made of the financial and economic aspects of the proposed projects. It is deemed proper that the

results of this analysis be furnished for the information of the committee and the Congress, upon which the final decision rests. The following presents a summary of those analyses.

ECONOMIC AND FINANCIAL ASPECTS—ECONOMIC JUSTIFICATION

Construction costs of the Navajo Indian project, including the costs of necessary storage at the Navajo Reservoir site on the San Juan River, are estimated at $163 million, which would amount to more than $1,500 an acre on the 105,000 acres to be served. The lands proposed to be irrigated are irregular and scattered areas of benchlands ranging from 5,000 to 6,200 feet in elevation and extending 16 to 40 miles southward from San Juan River. Principal land use would be the growing of alfalfa, pasture, grain, and beans, and the raising of sheep. Such uses will not support the cost of the proposed irrigation works.

For the initial phase of the San Juan-Chama project proposed for immediate authorization the construction costs chargeable to irrigation would be over $50 million total, or $200 to $1,200 an acre on the various units. The proposed diversion would provide only a supplemental supply amounting to about 0.4 of an acre-foot of water per acre per annum. The costs per equivalent acre on a full water supply basis would be $1,500 to $9,000. In contrast the indicated value of improved land with a full water supply ranges from about $130 to $300 an acre according to the planning report of the Bureau of Reclamation.

Since the Navajo Dam and Reservoir previously authorized has been declared by the Reclamation Bureau to be an essential and integral part of the Indian irrigation project and since storage in that reservoir would also be needed in connection with the proposed diversion to the Rio Chama, the estimated construction cost of the Navajo Dam is included in the figures cited in the preceding paragraphs. To omit such storage costs in the economic appraisal, as was done in the Interior Department reports, would be unrealistic and misleading.

Independent calculations of benefit-cost ratios result in ratios considerably less than unity for both projects. For the Navajo Indian project the ratio is less than 0.5 to 1 and for the San Juan-Chama about 0.7 to 1. Although benefit-cost ratios are not the proper criteria for evaluation of projects under reclamation law, the ratios independently calculated are believed to be more truly indicative of the economic worth of the projects than the ratios shown in the Interior Department reports.

It appears for the foregoing that neither the Navajo project nor the San Juan-Chama project is economically justified.

FINANCIAL FEASIBILITY

The Secretary of the Interior proposes in his report that none of the costs of the Navajo project be reimbursed to the Federal Government, as provided in section 6 of the Storage Project Act. The Federal investment thus proposed, including interest on funds advanced during the construction and development periods, would amount to more than a quarter of a billion dollars by the time the project would be in full operation. This is about $2,500 per acre of irrigated land and about $240,000 for each farm family that would be located on the project. Annual interest alone at a rate of 3 percent on the total investment would be nearly $8 million a year or about three times the direct annual irrigation benefits estimated in the report. The investment of $45,000 at 5 percent interest would provide the same annual family living allowances ($2,250) that it is estimated in the report would result from the investment of $240,000 per family in irrigation works.

As to the initial phase of the San Juan-Chama project, it appears that the municipal water users could repay with interest their share of the costs. But the irrigators could repay only about 16 percent of the costs allocated to irrigation according to the figures in the report. It appears questionable whether the irrigators would really be able to pay about $9 per acre-foot for water at the site of use as estimated by the Reclamation Bureau, but even if they could, their payment would amount to only about 7 percent of the Federal investment, including interest.

The total capital subsidy to irrigation for the initial stage of the San Juan-Chama project, including interest during construction and deducting the present value of the estimated repayment by the irrigators, amounts to more than $55 million. This is $470 per acre of land for a small supplemental water sup-

ply and $2,800 per acre on a full water supply basis. Annual interest alone on the total subsidy at 3 percent would be 25 percent greater than the direct annual irrigation benefits estimated in the report.

REPAYMENT FROM UPPER COLORADO RIVER BASIN FUND RESERVES

According to Department of Interior reports on the proposed projects, about $45 million or some 84 percent of the irrigation investment on the San Juan-Chama project would be repaid from New Mexico's share of Upper Colorado River Basin fund reserves. No showing is made in the reports as to when or how these costs would or could be paid from the basin fund.

It is by no means certain—in fact, it appears highly questionable—that there will be sufficient net revenues accruing to the basin fund to meet the required repayments of the projects, including the 11 participating projects already authorized by Public Law 485, in compliance with the provisions of the act. It appears that repayment from the basin fund of $45 million of the cost of the San Juan-Chama project would be so uncertain and far into the future as to be purely speculative. Hence, the project cannot be considered as financially feasible.

The foregoing summary with respect to the financial and economic aspects of the proposed projects is intended to provide information which may assist the committee and the Congress in the consideration of these factors. It is recognized that the final decision in regard to the authorization of proposed reclamation projects, from the standpoint of financial feasibility and economic justification as well as all other factors, must be made by the Congress with the approval of the executive department.

PROPOSED AMENDMENTS TO S. 3648

In connection with the further consideration of legislation for authorizations of the proposed projects, the Colorado River board desires to propose certain amendments deemed essential to safeguard the rights and interests of California in and to the waters of the Colorado River system.

AMENDMENTS PROPOSED TO H.R. 2352 AND H.R. 2494, TO AUTHORIZE THE NAVAJO INDIAN IRRIGATION PROJECT AND THE INITIAL STAGE OF THE SAN JUAN-CHAMA PROJECT AS PARTICIPATING PROJECTS OF THE COLORADO RIVER STORAGE PROJECT

A number of amendments are proposed to H.R. 2352 and H.R. 2494, the texts of which are attached. The amendments are keyed to page and line references in H.R. 2352 only but their substance applies to H.R. 2494 as well. The amendments may be explained as follows:

1. Amendments to section 1 re approval of the San Juan-Chama project

These bills would appear to approve the full San Juan-Chama project in both section 1 and section 6. Although under section 6(a) only the initial stage is authorized for construction now, under section 6(b) certain work is approved which would be useful only to the ultimate project. Such approval is recommended at page 32 of the regional director's supplemental report of May 1957. This recommendation is concurred in the letter of September 6, 1957, submitted jointly by the Commissioners of Indian Affairs and Reclamation and approved and adopted by the Secretary on October 16, 1957. The purpose of the proposed amendments is to make it plain that only the initial stage is approved and that only that stage is intended to be authorized.

2. Amendments to section 6 re authorization of the San Juan-Chama project

These amendments are to some extent supplementary to those proposed in section 1. In addition, we think the disclaimer of any commitment to the ultimate stage is necessary and appropriate because the Reclamation Bureau's supplemental report of May 1957 indicates that various project features will be constructed to accommodate the ultimate stage of the San Juan-Chama project and $2,800,000 of "deferred costs" are included. Finally, to avoid the problems which can result for other basin works in the extreme variations in diversions which may be made, we suggest the inclusion of the 10-year aggregate.

3. Proposed new section subjecting the projects to the law of the river

This proposal is in four subsections. Subsections (a), (b), and (d) are in the main modeled on four amendments made at the insistence of upper basin in-

terests to the bill which authorized the "second barrel" of the San Diego aqueduct (act of Oct. 11, 1951, Public Law 171, 82d Cong.), with necessary modifications. These subject the projects to the compacts, statutes, and treaties which comprise part of the so-called law of the river. In addition, subsection (d) also includes a declaration that Congress, by enacting this bill, does not interpret these documents. This is to guard against interpretations in the project reports (incorporated by reference in section 1 of the bill) which are not agreed to by all of the States of the Colorado River Basin. All of these subsections were adopted by the committee at our suggestion in connection with H.R. 594, the Fryingpan-Arkansas bill in the 85th Congress, and appear in section 7 of H.R. 13523, the bill finally reported out by the committee. Subsection (c) of our proposal would prohibit the use of any Colorado River system waters outside of the State of New Mexico. This subsection is in most respects the same as the proposal adopted by the committee in section 7(c) of the Fryingpan bill.

4. Proposed new section re quality of water studies

The question of the quality of water remaining for use in the lower basin is accentuated when projects involving transmountain diversions are proposed. A study of the quality question was authorized almost 20 years ago in the Boulder Canyon Project Adjustment Act (act of July 19, 1940, 54 Stat. 774) and 3 years ago in the Colorado River Storage Project Act (act of Apr. 11, 1956, 70 Stat. 105). Both authorizations were in general terms, however, and Interior has yet to produce any study on this problem. It is believed that a new statutory provision is necessary to indiacte what the study should embrace and to indicate that a report is to be made at the earliest possible date. It is believed that New Mexico has no objection to this amendment (hearings on S. 3694, p. 185).

5. Proposed new section re litigation and State water rights

This was also offered in connection with the Fryingpan bill in the 85th Congress. The Interior Department objected on several grounds in a communication to the committee (hearings on H.R. 594, pp. 168–170) while pressing no objection to the use of about the same language as in section 14 of the Colorado River Storage Project Act, which is the action the House subcommittee took, with some modifications. Major objections were to the inclusion of the word "construction" and of the contracts entered into under the various statutes comprising the law of the river. We think both of these features are within section 7 of the Storage Project Act relating to the operation of the hydroelectric features of the project. The purpose of our amendment is to bring all of this material into one provision applicable basinwide. To cure Interior's objection to the use of the Supreme Court as the original forum for disputes arising under contracts, we have added a sentence permitting access by the contracting parties to any court of competent jurisdiction.

6. Proposed new section re limitation on transmountain diversions

This proposal is in the alternative. Proposal "A" is patterned on the California Limitation Act which was required under section 4(a) of the Boulder Canyon Project Act. Both the Board and west slope interests in Colorado offered similar amendments to the House committee in connection with the Fryingpan bill in the 85th Congress (hearings on H.R. 594, pp. 96 and 97 (serial No. 11); same hearings, pp. 22–25 (serial No. 19)).

The matter was also raised in the Senate hearings on the Fryingpan project in 1955 when the following colloquy occurred:

"Senator ANDERSON. Before you go to your conclusion, Mr. Ely, have you ever given any thought to the possibility that the States of the upper basin might end this question of diversion, cross-mountain diversion project, by some sort of self-limitation act as California did, fixing the total amount?

"Mr. ELY. Yes, Mr. Chairman, I have. In my conclusion I come to that very point.

"Senator ANDERSON. I had thought this matter had come up several times and we are going to have to come to a resolution of it sometime. I wondered if it might not be well to set down some boundaries eventually and say that so much can be diverted" (hearings on S. 300, p. 223).

Proposal "B" is patterned on sections 13(c) and 13(d) of the Boulder Canyon Project Act. It would require that all future patents, grants, contracts, concessions, leases, permits, licenses, rights-of-way, or other privileges from the United States necessary or convenient for the use in New Mexico of Colorado River or its tributaries shall not be utilized to effect a total diversion out of the

basin of more than 20 percent of New Mexico's apportionment of beneficial consumptive use under article III(a) of the upper Colorado River Basin compact. The constitutional power of Congress to so condition the use of Federal property and privileges seems well established. See *Ivanhoe Irrigation District* v. *McCracken*, 357 U.S. 275, 294–295 (1958); *Arizona* v. *California*, 283 U.S. 423, 461–462 (1931).

The Arizona House passed a resolution in April 1955 which, among other things, opposed any projects to export additional water out of the basin (hearings on H.R. 412, p. 346).

At the time of the colloquy between Senator Anderson and Mr. Ely, cited above, California offered to attempt negotiations of a limitation on transmountain diversions. That offer was renewed last year and is again made now. The estimates of possible transmountain diversions from the upper basin at the time of the Colorado River compact were on the order of 350,000 to 500,000 acre-feet per year maximum. We understand the upper limit is exceeded now in Colorado alone. The projects inventoried in the Bureau's report on the Colorado River in 1947 (H. Doc. 419, 80th Cong., 1st sess.) aggregate on the order of about 3 million acre-feet of transmountain diversions. As Senator Anderson indicated, this problem should be resolved. An effective limitation on the water which may be taken out of the natural basin of the upper river by transmountain diversion should be of real assistance in the quality of water problem.

7. *Proposed new section re article III(d) delivery obligation*

The necessity for this amendment arises out of the testimony of Mr. S. E. Reynolds, the State engineer of New Mexico, before the Senate Interior Committee hearing S. 72 on March 16, 1959. In his prepared statement, Mr. Reynolds justified the specified diversion and water requirements proposed for the Navajo and San Juan-Chama projects in S. 72 as follows:

"For planning purposes New Mexico and the Department of the Interior have assumed that the State's entitlement to the waters of the San Juan River and its tributaries, under the provisions of the Colorado River compacts, amounts to a depletion at sites of use of 838,000 acre-feet per year. The modified studies which I have presented indicate that there is ample justification for this assumption."

Mr. Reynolds' "modified studies" were based upon Arizona exhibits 355, 356, and 357 (introduced in evidence in *Arizona* v. *California*) which he states:

"* * * purport to show that with effective storage capacity of 43 million acre-feet in the upper basin it is possible with the flows that occurred in the period 1909 through 1956, for the upper basin to deplete the flows at Lee Ferry by 7.5 million acre-feet of water per year and yet not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years."

Thus Mr. Reynolds plainly concedes that the planned New Mexico uses and the 75 million acre-foot delivery obligation to the lower basin at Lee Ferry required by article III(d) of the Colorado River compact, can only both be met with effective storage capacity in the upper basin approaching 43 million acre-feet.

However, no "effective storage capacity of 43 million acre-feet" presently exists. Existing and authorized reservoirs in the upper basin (including those authorized by the Colorado River Storage Project Act of 1956 (Public Law 485, 84th Cong., 2d sess.)) will provide only 25 million acre-feet of effective active storage capacity.[1] Mr. Reynolds does not deny that if only 25 million acre-feet of effective storage capacity exists in the upper basin then the uses planned by New Mexico in H.R. 2352 and H.R. 2494 in addition to committed uses by present and authorized projects, would directly conflict with New Mexico's obligation as a State of the upper division to deliver its share of the 75 million acre-feet at Lee Ferry to the lower basin as required by article III(d) of the Colorado River compact.

[1] Existing and authorized reservoirs in the upper basin will, when presently authorized reservoirs are completed, have a total capacity in excess of 37,600,000 acre-feet, and an active capacity (i.e., a capacity available for storage and regulated release of water) in excess of 29 million acre-feet. Because of the location of these reservoirs, this storage capacity will provide regulation equivalent to that which would be provided by a single reservoir of 25 million acre-feet of active storage capacity located on the main stream immediately above Lee Ferry. This is the effective storage capacity for purposes of determining the Lee Ferry delivery obligation of article III(d).

Since the States of the lower basin have no assurance that more than 25 million acre-feet of effective storage capacity will ever be provided in the upper basin,[2] the proposed amendment is imperative. It specifies that the article III(d) delivery obligation on the part of the upper division States to the lower basin at Lee Ferry takes precedence over the diversions and consumptive uses sought to be authorized for the proposed Navajo and San Juan-Chama project by H.R. 2352 and H.R. 2494. Upper basin representatives have asserted to the contrary that they may diminish the 75 million acre-foot 10-year III(d) obligation in preference to development of their uses up to the 7,500,000 acre-feet apportioned to the upper basin by article III(a) of the Colorado River compact. In the argument before the U.S. Supreme Court on California's motion to join the upper basin States in *Arizona* v. *California*, Mr. Chilson for the State of Colorado stated as follows:

"Mr. CHILSON. * * * Now, the rights and obligations of the upper States under the compact are relatively simple. The principal right they have is the apportionment by article 3(a) in perpetuity to beneficially consume 7,500,000 acre-feet of water per annum. Their principal obligations are two. Under articles (d) the upper States are not to deplete the flow of the river at Lee Ferry below 75 million acre-feet in each 10-year period.

"Justice BLACK. Suppose the time should come when those two obligations conflict with one another.

"Mr. CHILSON. If the Court please, at that time there will be undoubtedly an interbasin conflict. The lower basin will take one stand and, of course, we will take the stand which is most favorable to us, and if that time comes, unless it can be adjusted by negotiation between the interested parties, I assume that this Court will have to decide what will happen." (Transcript of oral argument before U.S. Supreme Court, *Arizona* v. *California*, No. 10, Original, December 8, 1955, p. 110.)

The uses proposed by H.R. 2352 and H.R. 2494 should not be permitted to jeopardize existing uses in the lower basin dependent upon receipt of the full 75 million acre-feet specified in article III(d) of the compact, nor cast a greater burden upon existing upper basin projects in meeting the III(d) obligation.

8. Proposed new section re article III(c) Mexican Treaty burden

The necessity for this amendment arises out of the testimony of Mr. S. E. Reynolds, the State engineer of New Mexico, in support of S. 72 before the Senate Interior Committee on March 16, 1959. Mr. Reynolds criticized the Arizona exhibits previously brought to the attention of the committee (Arizona exhibits 358, 359, 360, and 361) on the ground that the assumptions concerning the Mexican Treaty upon which they were based were fallacious. Mr. Reynolds stated:

"One of the assumptions incorporated in the Arizona exhibits presented by Mr. Matthew of southern California is that all of the virgin flow of the Colorado River at Lee Ferry over and above 15 million acre-feet in any year is available first to meet the obligation to deliver 1.5 million acre-feet of water per year at the international boundary. The result of this assumption is that an average of 1,280,000 acre-feet per year of that burden is placed on the upper basin. Even a casual reading of the 1922 compact will show, I believe, that there is no basis for such an assumption."

It is apparent that Mr. Reynolds disagrees with Arizona counsel responsible for the preparation of the Arizona exhibits in question regarding the possible extent of the obligation of the upper division States to deliver water to Mexico under the terms of article III(c) of the compact. The effect of the amendment is to prevent any prejudgment of this question by the proposed legislation.

No. 1

1. Amendments to section 1 re approval of the projects:

(*a*) At page 2, line 1, insert between "and" and "the": "the initial stage of".

(*b*) At page 2, line 10, insert between "and" and "the": "the initial stage of".

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[2] Geological Survey Circular 409, "Water Yield and Reservoir Storage in the United States" (1959) by Walter B. Langbein concludes:

"* * * There is a limit to the amount of storage that can be useful. The Colorado River Basin is an example of a river basin where storage development may be approaching, if not exceeding, the useful limit * * *" (p. 5).

No. 2

2. Amendments to section 6 re authorization of the San Juan-Chama project:
(*a*) On page 6, line 6, strike "an" and insert "the".
(*b*) On page 6, line 7, after "initial stage" insert "only".
(*c*) On page 6, line 16, strike the period and insert: "but not to exceed an aggregate of 1,100,000 acre-feet in any period of ten consecutive years, and nothing in this Act shall constitute a commitment, real or implied, to the further exportation of water from the Colorado River Basin."
(*d*) On page 7, line 8, insert the material appearing at lines 14 through 19, as follows: "the amount of water diverted in the Rio Grande Basin for uses served by the San Juan-Chama project shall be limited in any calendar year to the amount of imported water available to such uses from importation to and storage in the Rio Grande Basin in that year."
(*e*) Delete the balance of section 6 (from p. 7, line 8, through p. 9, line 3).

No. 3

3. Proposed new section subjecting projects to the law of the river:
"SEC. —. (a) The use of water, including that diverted from the Colorado River system to the Rio Grande Basin, through works constructed under authority of this Act, shall be subject to and controlled by the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, the Colorado River Storage Act, and the Mexican Water Treaty (Treaty Series 994), and shall be included within and shall in no way increase the total quantity of water to the use of which the State of New Mexico is entitled and limited under said compacts, statutes, and treaty, and every contract entered into under this Act for the storage, use, and delivery of such water shall so recite.
"(b) All works constructed under authority of this Act, and all officers, employees, permittees, licensees and contractees of the United States and of the State of New Mexico acting pursuant thereto and all users and appropriators of water of the Colorado River system diverted or delivered through the works constructed under authority of this Act and any enlargements or additions thereto shall observe and be subject to said compacts, statutes, and treaty, as hereinbefore provided, in the diversion, delivery, and use of water of the Colorado River system, and such condition and covenant shall attach as a matter of law whether or not set out or referred to in the instrument evidencing such permit, license, or contract 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 system.
"(c) None of the waters of the Colorado River system shall be exported from the natural basin of that system by means of works constructed under authority of this Act, or extensions and enlargements of such works, to the Rio Grande Basin for consumptive use outside of the State of New Mexico, and no such waters shall be made available for consumptive use in any State not a party to the Colorado River Compact by exchange or substitution or by use of return flow; nor shall the obligations of the State of New Mexico under the provisions of the Rio Grande Compact (53 Stat. 785) be altered by any operations of any project for transmountain diversion of Colorado River system water into the Rio Grande Basin.
"(d) No right or claim of right to the use of the waters of the Colorado River system shall be aided or prejudiced by this Act, and Congress does not, by its enactment, construe or interpret any provision of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, the Colorado River Storage Project Act, or the Mexican Water Treaty or subject the United States to, or approve or disapprove any interpretation of, said compacts, statutes, or treaty. anything in this Act to the contrary notwithstanding."

No. 4

4. Proposed new section re quality of water studies:
"SEC. —. The Secretary of the Interior is directed to continue his studies of the quality of water of the Colorado River system, to appraise its suitability for municipal, domestic, and industrial use and for irrigation in the various areas in

the United States in which it is used or proposed to be used, to estimate the effect of additional developments involving its storage and use (whether heretofore authorized or contemplated for authorization) on the remaining water available for use in the United States, to study all possible means of improving the quality of such water and of alleviating the ill effects thereof, and to report the results of his studies and estimates to the Congress on January 3, 1961, and every two years thereafter."

No. 5

5. Proposed new section re litigation and State water rights:

"SEC. —. In the construction, operation and maintenance of all facilities authorized by Federal law and under the jurisdiction and supervision of the Secretary of the Interior for the utilization of waters of the Colorado River system, including but not limited to all works authorized by this Act, the Secretary is directed to comply with the applicable provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, the Colorado River Storage Project Act, the Treaty with the United Mexican States, and any contract lawfully entered into by the United States under any of said Acts, or of this Act, in the storage and release of waters, and to comply with the laws of the States in which such waters are used relating to the control, appropriation, use and distribution of water in those States respectively. In the event of the failure of the Secretary of the Interior to so comply, any State of the Colorado River Basin may maintain an action in the Supreme Court of the United States to enforce the provisions of this section and consent is given to the joinder of the United States as a party in such suit or suits, as a defendant or otherwise. Consent to joinder of the United States is likewise given in any suit, action or proceeding brought in any court of competent jurisdiction upon any cause of action arising under any contract lawfully entered into by the United States pursuant to either of the Compacts or the Acts mentioned in this section."

No. 6

6. Proposed new section re limitation on transmountain diversions.

PROPOSAL A

"SEC. —. 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 unless and until the State of New Mexico, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this act that the aggregate annual diversion from the Colorado River Basin, by or in the State of New Mexico of water of and from the Colorado River Basin by means of transmountain diversion therefrom to any other drainage basin shall not exceed 20 per centum of the apportionment to which the State of New Mexico may be entitled pursuant to article III(a) of the Upper Colorado River Basin Compact, subject to the provisions of the Colorado River Compact and to the availability of water thereunder, and the President by public proclamation shall have declared that such act of the Legislature of New Mexico has been duly enacted and is effective."

PROPOSAL B

"SEC. —. (a) All patents, grants, contracts, concessions, leases, permits, licenses, rights-of-way, or other privileges from the United States or under its authority, hereafter executed, necessary or convenient for the use in New Mexico of the waters of the Colorado River or its tributaries, shall be upon the express condition and with the express covenant that such privilege shall not be utilized to effect either directly or indirectly, the diversion of such waters out of the natural drainage basin of the Colorado River for use in New Mexico beyond an annual quantity which, together with all other existing or authorized diversions out of that basin, equals 20 per centum of the apportionment of beneficial consumptive use of Colorado River system water to which the State of New Mexico may be entitled pursuant to article III(a) of the Upper Colorado River Basin Compact.

(b) 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 system.

No. 7

7. Proposed new sections re obligation of upper division States to meet article III(d) delivery oblization at Lee Ferry:

"SEC. —. The diversion of water for either or both of the projects authorized in this Act shall in no way impair or diminish the obligation of the 'States of the upper division' as provided in article III(d) of the Colorado River Compact 'not [to] 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.'"

No. 8

8. Proposed new section re obligation of upper division States to meet article III(c) Mexican Treaty delivery obligations:

"SEC. —. The diversion of water for either or both of the projects authorized in this Act shall in no way impair or diminish the obligation of the 'States of the upper division' to meet their share of the Mexican Treaty burden as provided in article III(c) of the Colorado River Compact."

Mr. SAUND. I ask unanimous consent that I may be permitted to file my statement in regard to these hearings within the next month. I am holding a meeting of all the representatives of the water users of the Colorado in Washington on June 18. That will be a good time for me to consult with them.

Mr. ASPINALL. Reserving the right to object to that request, and I do not know whether or not I shall object at this time, the usual practice is to give a member of the committee 10 days to prepare such a statement.

I wish to advise my colleague that this is not the end of this matter, that we will have other hearings.

It is my opinion that it will be far more approprate to file a brief in opposition to whatever is proposed or in support of whatever is proposed at this hearing later on than it will be to file an extensive brief with these hearings.

Mr. SAUND. I will accept the advice of the chairman.

Mr. ROGERS. Without objection the gentleman from California will be permitted to file a statement at the proper place in the record within the usual 10 days, and that will be included in the record.

(COMMITTEE NOTE.—The statement referred to was not submitted.)

Mr. ROGERS. Are there any other questions at this time?

If not the subcommittee will stand adjourned subject to further call of the Chair.

(Whereupon at 4:45 p.m., the subcommittee adjourned subject to call of the Chair.)

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DATE DUE			