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COLORADO RIVER STORAGE PROJECT



HEARINGS
BEFORE THE
SUBCOMMITTEE ON
IRRIGATION AND RECLAMATION
OF THE
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
UNITED STATES SENATE

EIGHTY-THIRD CONGRESS
SECOND SESSION

ON

S. 1555

A BILL TO AUTHORIZE THE SECRETARY OF THE INTERIOR
TO CONSTRUCT, OPERATE, AND MAINTAIN THE COLORADO
RIVER STORAGE PROJECT AND PARTICIPATING
PROJECTS, AND FOR OTHER PURPOSES

JUNE 28, 29, 30, JULY 1, 2, AND 3, 1954

Printed for the use of the Committee on Interior and Insular Affairs



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UNITED STATES
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WASHINGTON : 1954

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COLORADO RIVER STORAGE PROJECT

MONDAY, JUNE 28, 1954

UNITED STATES SENATE,
SUBCOMMITTEE OF THE COMMITTEE
ON INTERIOR AND INSULAR AFFAIRS,
Washington, D. C.

The subcommittee met at 10:45 a. m., pursuant to call, in room 457, Senate Office Building, Senator Eugene D. Millikin presiding.

Present: Senators Eugene D. Millikin, Colorado (chairman of the subcommittee); Arthur V. Watkins, Utah; and Clinton P. Anderson, New Mexico.

Present also: Senators Edwin C. Johnson, Colorado, Thomas H. Kuchel, California; and Wallace F. Bennett, Utah.

Present also: Elmer K. Nelson, staff consulting engineer, and N. D. McSherry, assistant chief clerk.

Senator MILLIKIN. The subcommittee will come to order.

This will be the opening of hearings on the upper Colorado River Basin storage program. There will be inserted in the record S. 1555, a bill to authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project, and participating projects, and for other purposes.

(The bill S. 1555 is as follows:)

[S. 1555, 83d Cong., 1st sess.]

A BILL To authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, the Congress, in the exercise of its constitutional authority to provide for the general welfare, to regulate commerce among the States, and to make all needful rules and regulations respecting property belonging to the United States, and for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the obligation undertaken by the States of the upper division in article III of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and Upper Colorado River Basin Compact, respectively, providing for the control of floods and for the improvement of navigation, and generating hydroelectric power, hereby authorizes the Secretary of the Interior (1) to construct, operate, and maintain the following initial units of the Colorado River storage project, consisting of dams, reservoirs, power plants, transmission facilities, and appurtenant works: Echo Park, Flaming Gorge, Glen Canyon, Navaho, and Curecanti: *Provided, however,* That the Curecanti Dam shall be constructed to a height which will impound not less than nine hundred and forty thousand acre-feet of water or will create a reservoir of such greater capacity as can be obtained by a high water line located at seven thousand five hundred and twenty feet above mean sea level; and (2) to construct, operate, and maintain the following additional reclamation projects (including power generating and transmission facilities related thereto), hereinafter referred to as participating projects: Central

Utah, Emery County, Gooseberry, Florida, San Juan-Chama, Shiprock-South San Juan Indian irrigation, Hammond, LaBarge, Lyman, Paonia (including the Minnesota unit, a dam and reservoir on Muddy Creek just above its confluence with the North Fork of the Gunnison River, and other necessary works), Pine River Extension, La Plata, Seedskaadee, Silt, and Smith Fork: *Provided*, That no appropriation for or construction of the San Juan-Chama project or the Shiprock-South San Juan Indian irrigation project shall be made or begun until coordinated reports thereon shall have been submitted to the affected States pursuant to the Act of December 22, 1944 (58 Stat. 887), and approved by the Congress: *Provided further*, That no appropriation for or construction of any part of the Central Utah project, beyond the initial phase thereof, shall be made or begun until a report thereon shall have been submitted to the affected States pursuant to the Act of December 22, 1944 (58 Stat. 887), and approved by the Congress. The benefits of the Act of July 1, 1932 (47 Stat. 564), are hereby extended and shall apply to all Indian lands served by each of the foregoing participating projects.

SEC. 2. Except as otherwise provided in this Act, in constructing, operating, and maintaining the units of the Colorado River storage project and the participating projects listed in section 1 of this Act, the Secretary shall be governed by the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto): *Provided*, That (a) irrigation repayment contracts entered into pursuant to those laws may, except as otherwise provided for the Paonia and Eden projects, provide for repayment of the obligation assumed thereunder over a period of not more than fifty years exclusive of any development period authorized by law; (b) contracts relating to municipal water supply may be made without regard to the limitations of the last sentence of section 9 (c) of the Reclamation Project Act of 1939; (c) in constructing, operating, and maintaining the Shiprock-South San Juan Indian irrigation project, the Secretary shall be governed by the laws relating to the development of irrigation projects on Indian reservations where applicable; and (d), as to Indian lands within, under or served by either or all participating projects, payment of construction costs shall be subject to the Act of July 1, 1932 (47 Stat. 564). Said units and projects shall be subject to the apportionments of the use of water between the Upper and Lower Basins of the Colorado River and among the States of the Upper Basin fixed in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, and to the terms of the treaty with the United Mexican States.

SEC. 3. The Colorado River storage project and participating projects shall be treated and accounted for as one project; the capital investment in the commercial power features of said project shall be returnable within a period not exceeding fifty years from the date of completion of such features unless, in the judgment of the Secretary, concurred in by the Federal Power Commission, a longer period is deemed justified; interest on the unamortized balance of the investment in the commercial power features of the said project shall be returnable at a rate not less than the average rate paid by the United States on its long-term loans outstanding at the date of authorization of the said project; interest at such rate shall be paid annually out of the net revenues of the commercial power features thereof into Miscellaneous Receipts of the Treasury; and the return of that part of the costs of the project (including, but without limitation, those portions of the reimbursable construction cost of the Paonia project (including the Minnesota unit, a dam and reservoir on Muddy Creek just above its confluence with the North Fork of the Gunnison River, and other necessary works) and of the irrigation features of the Eden project, as authorized in the Act of June 28, 1949 (63 Stat. 277), which are, in the case of the Paonia project, beyond the ability of the water users to repay within the period prescribed in the Act of June 25, 1947 (61 Stat. 181), and, in the case of the Eden project, in excess of the amount prescribed in the Act of June 28, 1949) allocated to irrigation but returnable from net power revenues, authorization for which said allocation and return under the Federal reclamation laws is hereby confirmed, shall begin on a date not later than the date upon which the return of the capital investment in the commercial power features of the said project has been completed.

SEC. 4. The hydroelectric powerplants authorized by this Act to be constructed, operated, and maintained by the Secretary shall, to the fullest practicable extent consistent with the purposes of this Act, the Colorado River Compact and the Upper Colorado River Basin Compact, be operated in conjunction with other Federal powerplants, present and potential, so as to produce the greatest practi-

cable amount of power and energy that can be sold at firm power and energy rates. Neither the impounding nor use of water solely for the generation of power and energy at such plants shall preclude the use and consumption of water of the Upper Colorado River System for domestic or agricultural purposes; and the Secretary, upon the application of any party proposing to make any such use (which application is concurred in by the appropriate officials of the State or States in which such use is proposed to be made), after notice given by said party to all other interested parties and opportunity for public hearing on the issues involved and unless good cause be shown why such application should not be granted, shall release to the extent required for such use any right that the United States may have to impound and use water solely for the generation of power and energy as aforesaid. The Secretary is hereby authorized to enter into such contracts or agreements as, in his opinion, are feasible based upon a recognition and evaluation of the benefits arising from integrated operation of other hydroelectric powerplants and of the works herein authorized. Electric power generated at plants authorized by this Act and disposed of for use outside the States of the Upper Colorado River Basin shall be replaced from other sources, as determined by the Secretary, when required to satisfy needs in the States of the Upper Colorado River Basin, at rates not to exceed those in effect for power generated at plants authorized by this Act. Contracts for the sale of power for use outside the States of the Upper Colorado River Basin shall contain such provisions as the Secretary shall determine to be necessary to effectuate the purposes of this Act, including the provision that if and when the Secretary finds (a) that such power cannot practically be replaced from other sources at rates not exceeding those in effect for power generated by plants authorized by this Act, and (b) that such power is required to satisfy needs in the States of the Upper Colorado River Basin, then such contracts shall be subject to termination or to modification to the extent deemed necessary by the Secretary to meet power requirements in the States of the Upper Colorado River Basin.

SEC. 5. In order to achieve such comprehensive development as will assure the consumptive use in the States of the Upper Colorado River Basin of waters of the Colorado River system the use of which is apportioned to the Upper Colorado River Basin by the Colorado River Compact and to each State thereof by the Upper Colorado River Basin Compact, it is the intent of the Congress to authorize the construction, operation, and maintenance of further units of the Colorado River storage project, of additional phases of participating projects authorized in this Act, and of new participating projects as additional information becomes available and additional needs are indicated. It is hereby declared to be the purpose of the Congress to authorize as participating projects only projects (including units or phases thereof)—

(1) for the use, in one or more of the States designated in article III of the Upper Colorado River Basin Compact, of waters of the Upper Colorado River system the consumptive use of which is apportioned to those States by that article;

(2) whose total benefits exceed their total costs including, but without limitation, costs attributable to the direct use of the facilities of the Colorado River storage project or any other project and an appropriate share of the costs of the Colorado River storage project;

(3) which are able, with their anticipated revenues from irrigation, based on the irrigators' ability to pay, to meet the operation, maintenance, and replacement costs allocated to irrigation and to pay within a period of fifty years following a suitable development period at least part of the construction cost allocated to irrigation;

(4) which have available, to aid them, an appropriate district, preferably of the water-conservancy type, which is satisfactory to the Secretary, one purpose of which shall be to provide revenues for the project over and above those paid by the irrigators, to assist in repayment of construction costs allocated to irrigation; and

(5) for which pertinent data sufficient to determine their probable engineering and economic justification and feasibility shall be available.

It is likewise declared to be the policy of the Congress that a new project, unit, or phase thereof shall be authorized as a participating project only when and to the extent that all sources of revenue directly available to said project, unit, or phase are insufficient to return its reimbursable costs during a fifty-year payout period.

SEC. 6. There is hereby established in the Treasury a special fund, designated the "Upper Colorado River Development Fund," to which shall be transferred at the end of each fiscal year, beginning with the initial year of commercial power production by the Colorado River storage project $7\frac{1}{2}$ per centum of the net power revenues for that year after such net revenues exceed \$5,000,000 annually, but not to exceed \$1,000,000 in any one fiscal year. The moneys so transferred shall be available upon appropriation (such appropriation to remain available until expended) for expenditure by the Secretary, without prejudice to the use by him for the same purposes of other appropriated moneys, for studies and investigations relating to the development, conservation, and utilization of the waters of the Upper Colorado River Basin, all expenditures from said fund to be non-reimbursable and nonreturnable under the reclamation laws. Funds appropriated for carrying out the authorizations contained in section 1 of this Act shall also be available for carrying out the studies and investigations set forth in this section.

SEC. 7. There is hereby established in the Treasury, from the receipts of the Colorado River storage project, a continuing fund of \$1,000,000 to the credit of and subject to expenditure by the Secretary to defray emergency expenses and to insure continuous operation of the project.

SEC. 8. The Secretary shall report to the Congress as of the close of each fiscal year beginning with the fiscal year 1955 upon the status of the revenues from and the cost of constructing, operating, and maintaining the Colorado River storage project and the participating projects. The Secretary's report shall be prepared in such manner as accurately to reflect the Federal investment allocated to power, to irrigation, and to other purposes and the progress of return and repayment thereon, and the estimated rate of progress, year by year, in accomplishing full repayment.

SEC. 9. The Secretary is authorized and directed to plan, construct, operate, and maintain public recreational facilities on lands withdrawn or acquired for the development of the Colorado River storage project or of the participating projects, except on lands in Indian reservations, to conserve the scenery, the natural, historic, and archeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects by such means as are consistent with the primary purposes of said projects; and to mitigate losses of and improve conditions for the propagation of fish and wildlife in connection with the development of the Colorado River storage project and of the participating projects. The Secretary is authorized to acquire lands and to withdraw public lands from entry or other disposition under the public land laws for the construction, operation, and maintenance of recreational facilities in connection with the said projects, and to dispose of them to Federal, State, and local governmental agencies by lease, transfer, exchange, or conveyance, upon such terms and conditions as will best promote their development and operation in the public interest. The costs, including the operation and maintenance costs, of all said undertakings shall be nonreimbursable and nonreturnable under the reclamation laws, and funds appropriated for carrying out the authorization contained in section 1 of this Act shall, without prejudice to the availability of other appropriated moneys for the same purposes, also be available for carrying out the investigations and programs authorized in this section.

SEC. 10. The Secretary is hereby authorized to undertake the investigations and programs of cooperating Federal agencies outlined in paragraphs 33 to 39, inclusive, of the report of the regional director, region 4, Bureau of Reclamation, dated December 15, 1950, and entitled "Colorado River Storage Project and Participating Projects, Upper Colorado River Basin". The cost thereof shall be nonreimbursable and nonreturnable under the reclamation laws, and funds appropriated for carrying out the authorizations contained in section 1 of this Act shall, without prejudice to the availability of other appropriated moneys for the same purposes, also be available for carrying out the investigations and programs authorized in this section.

SEC. 11. Nothing contained in this Act shall be construed to alter, amend, or repeal the Boulder Canyon Project Act (45 Stat. 1057) or the Boulder Canyon Project Adjustment Act (54 Stat. 774).

SEC. 12. Construction of the projects herein authorized shall proceed as rapidly as is consistent with budgetary requirements and the economic needs of the country.

SEC. 13. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be required to carry out the purposes of this Act.

SEC. 14. As used in this Act—

The term "Colorado River Basin", "Colorado River Compact", "Colorado River System", "Lee Ferry", "States of the Upper Division", "Upper Basin", and "domestic use" shall have the meaning ascribed to them in article II of the Upper Colorado River Basin Compact;

The term "States of the Upper Colorado River Basin" shall mean the States of Arizona, Colorado, New Mexico, Utah, and Wyoming;

The term "Upper Colorado River Basin Compact" shall mean that certain compact executed on October 11, 1948, by commissioners representing the States of Arizona, Colorado, New Mexico, Utah, and Wyoming, and consented to by the Congress of the United States of America by Act of April 6, 1949 (63 Stat. 31); and

The term "treaty with the United Mexican States" shall mean that certain treaty between the United States of America and the United Mexican States signed at Washington, District of Columbia, February 3, 1944, relating to the utilization of the waters of the Colorado River and other rivers, as amended and supplemented by the protocol dated November 14, 1944, and the understandings recited in the Senate resolution of April 18, 1945, advising and consenting to ratification thereof.

Senator MILLIKIN. There will be a statement next by the President of the United States under date of March 20, 1954.

Next comes the statement of the report of the Bureau of the Budget, March 18, 1954.

Next a report from the Department of the Interior, April 1954.

Next will be a report of the Department of the Army, dated June 14, 1954.

Next a report of the Federal Power Commission, June 18, 1954.

Next a report of the Department of Agriculture.

Then there will be H. R. 4449, as reported by the House committee. (The data referred to follows:)

THE WHITE HOUSE

STATEMENT BY THE PRESIDENT

I have today approved recommendations for the development of the upper Colorado River Basin.

The general plan upon which these recommendations are based has been prepared by the Secretary of the Interior. The Secretary's recommendations have been reviewed by the Bureau of the Budget. Legislation embodying the administration's recommendations is being prepared for introduction in the Congress.

This is a comprehensive, well-planned development of a river basin. The close Federal-State cooperation upon which the Secretary's plan is based also carries out this administration's approach to water resource development.

The development will conserve water, enabling the region to increase supplies for municipal uses, industrial development, and irrigation. It will develop much-needed electric power.

The development calls for sound financing. The legislation now being drafted will set up a fund for the entire project so that it will be constructed and paid for as a basin program.

Construction of the Echo Park and Glen Canyon Dams, two of the large projects in the basin plan, is recommended. These dams are key units strategically located to provide the necessary storage of water to make the plan work at its maximum efficiency.

The legislation being drafted will authorize a number of projects which will put to use the waters of the upper Colorado. This authorization will become effective following further consideration by the Secretary of the Interior, with the assistance of the Secretary of Agriculture, of the relation of these projects to the wise use and sound development of the basin.

I am deferring my recommendation on the Shiprock unit of the Navajo project until the Secretary has completed his study.

I hope the Congress will give early consideration to enactment of the administration's legislative proposal. I firmly believe development of the upper Colorado River Basin, in accordance with its provisions, is in the national interest.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington 25, D. C., March 18, 1954.

HON. HUGH BUTLER,
Chairman, Committee on Interior and Insular Affairs,
United States Senate, Washington 25, D. C.

MY DEAR MR. CHAIRMAN: I am authorized to inform you that the President has given his general approval to the comprehensive plan for the development of the water resources of the upper Colorado River Basin outlined in the supplemental report recently completed by the Secretary of the Interior.

The comprehensive plan of development proposed would consist of (1) a series of large dams on the Colorado River and its major tributaries for the purpose of conservation storage and the generation of hydroelectric energy, and (2) a group of related irrigation projects in the five upper basin States. These projects have been developed to permit the upper basin States to utilize the waters allocated to them under the terms of the Colorado River compact of 1922.

Attached is a copy of our letter to the Secretary of the Interior expressing our views on his supplemental report. This letter also reflects our views with respect to the authorizing legislation necessary to carry out the administration's recommendations. These recommendations would require modification of the terms of S. 1555 on which you have requested the Bureau's views in the following respects:

- (1) Authorization limited to those projects which are recommended for construction in the Secretary's report and upon which planning activities have been completed.
- (2) Authorization of participating projects to become effective following re-examination and a new finding of favorable economic justification by the Secretary of the Interior.
- (3) Financial arrangements for the entire development consolidated through the establishment of a separate revolving fund.
- (4) Provision made for returning to the general fund of the Treasury all reimbursable costs of the project including interest on the commercial power and municipal water supply investment.
- (5) Greater emphasis given to the use of conservancy districts for the purpose of carrying out local responsibilities.
- (6) Conditions governing the sale of power clarified to provide needed flexibility and still give adequate protection to upper basin interests.
- (7) Authorized recreational facilities and improvements for fish and wildlife financed by the agencies responsible for these programs.
- (8) Work of participating agencies carried on under existing statutory authority and financed by the agencies performing the work.

Legislation to implement these proposals is now being drafted and will be submitted to the Congress as a part of the President's program.

In the light of the foregoing, it is recommended that you defer your consideration of S. 1555 in its present form, pending submission of the legislation mentioned above.

Sincerely yours,

JOS. M. DODGE, *Director.*

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington 25, D. C., March 18, 1954.

The honorable the SECRETARY OF THE INTERIOR.

MY DEAR MR. SECRETARY: This is in response to your letter of December 10 to the President and to the Bureau of the Budget, submitting your supplemental report on the Colorado River storage project and participating projects. Further development of the upper Colorado River Basin in general accordance with the recommendations contained in your supplemental report has the support of the President. Legislation for that purpose which would authorize economically justified developments would be in accord with his program. With respect to the supplemental report, you are advised as follows:

1. The basinwide planning and close Federal-State cooperation which underlie your report carry out this administration's approach to water resource development.

2. Subject to the requirements of paragraphs 8 and 9 below, authorization of the Glen Canyon and Echo Park units of the storage project would be in accord with the program of the President. These units are strategically located to provide replacement storage to meet the upper basin's commitment to the lower basin and to permit increased consumptive use of water in the upper basin. In addition, both units will generate substantial amounts of hydroelectric power.

3. Authorization of recreational facilities to be constructed by the National Park Service within the Dinosaur National Monument would be in accord with the program of the President. Appropriations for this purpose should be so authorized that they can be made directly to the Park Service.

4. A requirements that conservancy districts be established to assist in irrigation repayments would be in accord with the program of the President and should be met before any participating project is undertaken.

5. Authorization to make the surplus power revenues of the storage projects available for repayment of construction costs of the Eden project and of the previously authorized portion of the Paonia project would be without objection.

6. Provisional authorization of the Shiprock unit of the Navaho project would not be in accord with the program of the President at this time. This advice is without prejudice to further consideration of the project when a report is completed indicating its economic justification, the views of the affected States and agencies, and the relation of the project to other potential uses of water of the San Juan River.

7. Subject to the requirements of paragraphs 8 and 9 below, a conditional authorization for construction of the other participating projects recommended in your report, including the Minnesota unit of the Panonia project, would be in accord with the program of the President. The authorization would become effective following a new finding of favorable economic justification by the Secretary of the Interior after individual project reports have been prepared which include—

(a) A joint study with the Department of Agriculture of the direct agricultural benefits of each project.

(b) A reevaluation of the nondirect benefits of each project, based upon a reexamination of the methods presently used to compute the indirect and public benefits of reclamation projects.

The development of irrigation in the upper Colorado River Basin to use the increased supply of water made available as a result of the storage project is recognized as an integral part of the basin plan. Reclamation projects in the upper basin which are economically justified and which represent wise use of available resources in a manner consistent with State water laws and inter-State compacts have the full support of the administration. Authorization of the participating projects proposed in your report should be contingent on reexamination so that there may be no doubt about the economic justification of the projects finally undertaken. Reexamination is particularly necessary in the case of those projects which show a favorable economic justification only if a useful economic life of 100 years is assumed and if the full estimate of indirect and public benefits—the so-called "secondary" benefits—used in your report is accepted. It is recognized that a basic purpose of the reclamation laws is to spur development of the West. Consequently, it follows that the justification of a reclamation project is not adequately measured by a simple comparison of project costs with the dollar value of the agricultural produce and other goods and services directly produced by the project. However, the procedures used to compute the secondary benefits of the participating projects proposed for authorization would appear to require a fundamental reexamination.

The standards and procedures for the economic appraisal of water-resource projects are now under review in the Executive Office. It is expected that any final recommendations made by the Secretary of the Interior would take into account the conclusions reached as a result of this review.

8. Provision should be made in the authorizing legislation for financing the project through a separate revolving fund established in the Treasury which would (a) receive all appropriations for construction and operation and maintenance as advances from the general fund; (b) receive all revenues collected in connection with the operation of the project; (c) be available for the operation and maintenance of the project, subject to such limitations as may be imposed by the Congress in annual appropriation acts; (d) be available for construction

in accordance with the appropriations made therefor; (e) provide funds for the payments referred to in paragraph 5 above; and (f) pay to the general fund of the Treasury annually, after completion of any feature or unit, a sum sufficient to return within 50 years, exclusive of authorized development periods, the full reimbursable costs of that unit or feature, including interest on the commercial power and municipal water supply investment. It is expected that the interest-bearing and non-interest-bearing investments will be repaid concurrently to the extent practicable.

9. The cost allocations proposed in your report for the storage project and the participating projects should, prior to initiation of construction, be refined and adjusted to conform to the standards and procedures established for use by all agencies at that time. In this connection, it is suggested that Assistant Secretary Aandahl's letter to this Bureau of March 2, 1954, dealing with future refinement of the cost allocation of the storage project, be made a part of your report to the Congress.

10. Authorization for a development fund for use in conducting investigations in the basin would not be in accord with the President's program. Existing statutory authority is adequate for these purposes and the regular general investigations appropriation, rather than the revenues of any project, should be used to finance such investigations.

11. The revolving fund discussed in paragraph 8 above will eliminate the need for a separate continuing fund of \$1 million recommended in your report. The revolving fund will provide the basis for financing operations, maintenance, and emergency work of the project.

12. The necessity for authorization for agencies of the Department other than the Bureau of Reclamation to participate in the project, as your report recommends, is not clear. It would appear that participation by such agencies could be accomplished under the existing authority of each agency, and that work to be performed by these agencies could be financed directly as a part of their regular programs. Participation by these agencies in the basin development should, of course, be coordinated by the Department.

We should be glad to work with your representatives in the preparation of legislation for authorization of the upper Colorado Basin development which would accord with the conditions set forth above and which could be presented to the Congress as a substitute for S. 1555, H. R. 4443, H. R. 4449, and H. R. 4463.

It is requested that a copy of this letter accompany your modified report when it is submitted to the Congress.

Sincerely yours,

Jos. M. DODGE, *Director.*

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., April 1, 1954.

HON. HUGH BUTLER,
*Chairman, Committee on Interior and Insular Affairs,
United States Senate, Washington, D. C.*

MY DEAR SENATOR BUTLER: As you know representatives of this Department have been consulting with representatives of the Bureau of the Budget in the preparation of suggested legislation to implement the recommendations of the two agencies concerning the Colorado River storage project and participating projects.

It is understood that there is a particular urgency for prompt submission of such legislative suggestions, and, accordingly, we are forwarding herewith copies of a draft bill incorporating our recommendations without the further delay which would be occasioned by the preparation of a detailed report on legislation pending before your committee.

Sincerely yours,

DOUGLAS MCKAY,
Secretary of the Interior.

A BILL To authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, the

Congress, in the exercise of its constitutional authority to provide for the general welfare, to regulate commerce among the States and with the Indian tribes, and to make all needful rules and regulations respecting property belonging to the United States, and for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, the control of floods, the improvement of navigation, and the generation of hydroelectric power as an incident of the foregoing purposes, hereby authorizes the Secretary of the Interior (herein called the Secretary) (1) to construct, operate, and maintain the following initial units of the Colorado River storage project, consisting of dams, reservoirs, powerplants, transmission facilities, and appurtenant works: Echo Park and Glen Canyon; and (2) to construct, operate, and maintain the following additional reclamation projects (including power generating and transmission facilities related thereto), hereinafter referred to as participating projects: Central Utah (Initial Phase), Emery County, Florida, Hammond, LaBarge, Lyman, Paonia (including the Minnesota unit, a dam and reservoir on Muddy Creek just above its confluence with the North Fork of the Gunnison River, and other necessary works), Pine River Extension, Seedekadee, Silt, and Smith Fork: *Provided*, That the authority to construct any participating project listed in the foregoing clause (2) shall not become effective until the Secretary has reexamined the economic justification of such project and, accompanied by appropriate documentation in the form of a supplemental report, has certified to the Congress through the President that, in his judgment, the benefits of such project will exceed its costs. The Secretary's supplemental report for each such project shall include, *among other things*, (a) a reappraisal of the prospective direct agricultural benefits of the project, made by the Secretary in cooperation with the Secretary of Agriculture, and (b) a reevaluation of the nondirect benefits of the project. Section 1 (c) of the Flood Control Act of 1944 (58 Stat. 887), shall not be applicable to such supplemental reports.

SEC. 2. In order to achieve such comprehensive development as will assure the consumptive use in the States of the Upper Colorado River Basin of waters of the Colorado River system the use of which is apportioned to the Upper Colorado River Basin by the Colorado River Compact and to each State thereof by the Upper Colorado River Basin Compact, it is the intent of the Congress in the future to authorize the construction, operation, and maintenance of further units of the Colorado River storage project, of additional phases of participating projects authorized in this act, and of new participating projects as additional information becomes available and additional needs are indicated. It is hereby declared to be the purpose of the Congress to authorize as participating projects only projects (including units or phases thereof)—

(1) for the use, in one or more of the States designated in Article III of the Upper Colorado River Basin Compact, of waters of the Upper Colorado River system the consumptive use of which is apportioned to those States by that article;

(2) for which pertinent data sufficient to determine their probable engineering and economic justification and feasibility shall be available.

It is likewise declared to be the policy of the Congress that the costs of any participating project authorized in the future shall be amortized from its own revenues to the fullest extent consistent with the provisions of this act and Federal reclamation law.

SEC. 3. Except as otherwise provided in this Act, in constructing, operating, and maintaining the units of the Colorado River Storage project and the participating projects listed in section 1 of this Act, the Secretary shall be governed by the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto): *Provided*, That (a) irrigation repayment contracts shall be entered into which, except as otherwise provided for the Paonia and Eden projects, provide for repayment of the obligation assumed thereunder with respect to any project contract unit over a period of not more than fifty years exclusive of any development period authorized by law; (b) prior to construction of irrigation distribution facilities repayment contracts shall be made with an "organization" as defined in paragraph 2 (g) of the Reclamation Project Act of 1939 (53 Stat. 1187, 43 U. S. C. 485) which has the capacity to levy assessments upon all taxable real property located within its boundaries to assist in making repayments, except where a substantial proportion of the

lands to be served are owned by the United States; (c) contracts relating to municipal water supply may be made without regard to the limitations of the last sentence of section 9 (c) of the Reclamation Project Act of 1939; and (d), as to Indian lands within, under or served by any participating project, payment of construction costs within the capability of the land to repay shall be subject to the Act of July 1, 1932 (47 Stat. 564). All units and participating projects shall be subject to the apportionments of the use of water between the Upper and Lower Basins of the Colorado River and among the States of the Upper Basin fixed in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, and to the terms of the treaty with the United Mexican States (Treaty Series 904).

Sec. 4. (a) There is hereby authorized a separate fund, to be known as the Upper Colorado River Basin Fund (hereinafter referred to as the Basin Fund), which shall remain available until expended, as hereafter provided, for carrying out the provisions of this Act other than section 7.

(b) All appropriations made for the purpose of carrying out the provisions of this Act, other than section 7, shall be credited to the Basin Fund as advances from the general fund of the Treasury.

(c) All revenues collected in connection with the operation of the Colorado River Storage project and participating projects shall be credited to the Basin Fund, and shall be available, without further appropriation, for (1) defraying the costs of operation and maintenance of, and emergency expenditures for, all facilities of the Colorado River Storage project and participating projects, within such separate limitations as may be included in annual appropriation acts, (2) payment as required by subsection (d) of this section, (3) payment of the reimbursable construction costs of the Paonia project which are beyond the ability of the water users to repay within the period prescribed in the Act of June 25, 1947 (61 Stat. 181), said payment to be made within 50 years after completion of that portion of the project which has not been constructed as of the date of this Act, and (4) payment in connection with the irrigation features of the Eden project as specified in the Act of June 28, 1949 (63 Stat. 277): *Provided*, That revenues credited to the Basin Fund shall not be available for appropriation for construction of the units and participating projects authorized by or pursuant to this Act.

(d) Revenues in excess of operating needs shall be paid annually to the general fund of the Treasury to return:

(1) the costs of each unit, participating project, or any separable feature thereof which are allocated to commercial power pursuant to Section 6 of this Act, within a period not exceeding fifty years from the date of completion of such unit, participating project or separable feature thereof;

(2) the costs of each unit, participating project, or any separable feature thereof which are allocated to municipal water supply pursuant to Section 6 of this Act, within a period not exceeding fifty years from the date of completion of such unit, participating project, or separable feature thereof;

(3) interest on the unamortized balance of the investment (including interest during construction) in the commercial power and municipal water supply features of each unit, participating project, or any separable feature thereof, at a rate determined by the Secretary of the Treasury as provided in subsection (e), and interest due shall be a first charge;

(4) the costs of each unit, participating project, or any separable feature thereof which are allocated to irrigation pursuant to Section 6 of this Act, within a period not exceeding fifty years, in addition to any development period authorized by law, from the date of completion of such unit, participating project or separable feature thereof, or, in the cases of the Paonia project and of Indian lands, within a period consistent with other provisions of law applicable thereto.

(c) The interest rate applicable to each unit of the storage project and each participating project shall be determined by the Secretary of the Treasury as of the time the first advance is made for initiating construction of said unit or project. Such interest rate shall be determined by calculating the average yield to maturity on the basis of daily closing market bid quotations during the month of June next preceding the fiscal year for which said appropriation is enacted, on all interest-bearing marketable public debt obligations of the United States having a maturity date of 15 or more years from the first day of said month, and by adjusting such average annual yield to the nearest $\frac{1}{8}$ of 1 per centum.

(f) Business-type budgets shall be submitted to the Congress annually for all operations financed by the Basin Fund.

Sec. 5. Upon completion of each unit, participating project or separable feature thereof the Secretary shall allocate the total costs (excluding any expenditures authorized by Section 7 of this Act) of constructing said unit, project or feature to power, irrigation, municipal water supply, flood control, navigation, or any other purposes authorized under Reclamation Law. Allocations of construction, operation and maintenance costs to authorized nonreimbursable purposes shall be nonreturnable under the provisions of this Act. On January 1 of each year the Secretary shall report to the Congress for the previous fiscal year, beginning with the fiscal year 1955, upon the status of the revenues from and the cost of constructing, operating, and maintaining the Colorado River Storage project and the participating projects. The Secretary's report shall be prepared to reflect accurately the Federal investment allocated at that time to power, to irrigation, and to other purposes, the program of return and repayment thereon, and the estimated rate of progress, year by year, in accomplishing full repayment.

Sec. 6. The hydroelectric powerplants authorized by this Act to be constructed, operated, and maintained by the Secretary shall, to the extent fully consistent with the purposes of this Act, the Colorado River Compact and the Upper Colorado River Basin Compact, be operated in conjunction with other Federal powerplants, present and potential, so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates. Neither the impounding nor the use of water for the generation of power and energy at the plants of the Colorado River Storage project shall preclude or impair the appropriation for domestic or agricultural purposes, pursuant to applicable State law, of waters apportioned to the States of the Upper Colorado River Basin. No contract or agreement for the sale of electric power generated at plants authorized by this Act shall be made for a period of more than ten years when such power is disposed of for use outside the States of the Upper Colorado River Basin, unless the Secretary of the Interior shall have determined that such power is surplus to the probable needs in such States. All other contracts for the sale of electric power pursuant to this Act shall be for periods not to exceed forty years.

Sec. 7. In connection with the development of the Colorado River Storage project and of the participating projects, the Secretary is authorized and directed to investigate, plan, construct, operate, and maintain (1) public recreational facilities on lands withdrawn or acquired for the development of said project or of said participating projects, to conserve the scenery, the natural, historic, and archeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects by such means as are consistent with the primary purposes of said projects; and (2) facilities to mitigate losses of and improve conditions for the propagation of fish and wildlife. The Secretary is authorized to acquire lands and to withdraw public lands from entry or other disposition under the public land laws for the construction, operation, and maintenance of the facilities herein provided, and to dispose of them to Federal, State, and local governmental agencies by lease, transfer, exchange, or conveyance upon such terms and conditions as will best promote their development and operation in the public interest. All costs incurred pursuant to this section shall be nonreimbursable and nonreturnable.

Sec. 8. Nothing contained in this Act shall be construed to alter, amend, repeal, construe, interpret, modify, or be in conflict with, any provision of the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774), the Colorado River Compact, the Upper Colorado River Basin Compact, or the Treaty with the United Mexican States (Treaty Series 994).

Sec. 9. Expenditures for the units of the Colorado River Storage project may be made without regard to the soil survey and land classification requirements of the Interior Department Appropriation Act, 1954.

Sec. 10. Construction of the projects herein authorized shall proceed as rapidly as is consistent with budgetary requirements and the economic needs of the country.

Sec. 11. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be required to carry out the purposes of this Act, but not to exceed \$950,000,000.

Sec. 12. As used in this Act—

The terms "Colorado River Basin", "Colorado River Compact", "Colorado River System", "Lee Ferry", "States of the Upper Division", "Upper Basin",

and "domestic use" shall have the meaning ascribed to them in Article II of the Upper Colorado River Basin Compact;

The term "States of the Upper Colorado River Basin" shall mean the States of Arizona, Colorado, New Mexico, Utah, and Wyoming;

The term "Upper Colorado River Basin" shall have the same meaning as the term "Upper Basin";

The term "Upper Colorado River Basin Compact" shall mean that certain compact executed on October 11, 1948, by commissioners representing the States of Arizona, Colorado, New Mexico, Utah, and Wyoming, and consented to by the Congress of the United States of America by Act of April 6, 1949 (63 Stat. 31); and

The term "treaty with the United Mexican States" shall mean that certain treaty between the United States of America and the United Mexican States signed at Washington, District of Columbia, February 3, 1944, relating to the utilization of the waters of the Colorado River and other rivers, as amended and supplemented by the protocol dated November 14, 1944, and the understandings recited in the Senate Resolution of April 18, 1945, advising and consenting to ratification thereof.

Amend the title to read: "A bill to authorize the Secretary of the Interior to construct, operate, and maintain initial units of the Colorado River Storage Project and participating projects, and for other purposes."

JUNE 14, 1954.

HON. HUGH BUTLER,

*Chairman, Committee on Interior and Insular Affairs,
United States Senate.*

DEAR MR. CHAIRMAN: Reference is made to your request for the views of the Department of the Army with respect to S. 1555, 83d Congress, a bill "to authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and for other purposes."

The Department of the Army has considered the above-mentioned bill. The purpose of the bill is to authorize the principal features of the Colorado River storage project and participating projects of the Bureau of Reclamation.

Comments on 3 of the major units (Flaming Gorge, Navaho, and Curecanti) in the comprehensive plan covered by S. 1555 and on the participating projects are not practicable from an engineering and economic standpoint without an up-to-date engineering and economic report. However, with respect to the 2 remaining major units (Echo Park and Glen Canyon), the Department of the Army has recently reviewed a report of the Department of the Interior and has commented to that Department that these 2 storage projects appear to be justified.

Although the Department is authorized to undertake certain examinations and surveys in the upper Colorado River Basin and has an interest in the Rio Grande Basin which is involved in the bill to the extent of the diversion contemplated in one of the participating projects, there appears to be no basic conflict between the project units proposed in the bill and any which the Department now has or might have an interest in as a result of future investigation or construction. However, because of the departmental interest in flood control, it is recommended that the bill be amended in the following manner:

(1) In section 2, page 3, line 25, after "Provided," insert: "That allocation of costs to flood control as nonreimbursable costs shall be determined by the Secretary after consultation with the Chief of Engineers and the Secretary of the Army and any necessary investigations or studies therefor may be performed under a cooperative agreement with the Secretary of the Army: *Provided further*,";

(2) In section 1, page 3, lines 8 and 14, after "affected States", insert: "and the Secretary of the Army".

In connection with S. 1555, the attention of your committee is invited to substitute draft legislation which was submitted by the Secretary of the Interior to the Congress on April 1, 1954. The substitute draft bill is intended to bring the proposed legislation into correlation with the project report referred to above in that it would authorize only the Echo Park and Glen Canyon storage units and would grant provisional authorization only for certain of the participating projects. The Department of the Army considers the draft bill as being preferable to S. 1555 and offers no objection to the authorization of the improvements proposed in the substitute draft legislation. However, the insertion sug-

gested in (1) above would apply as well to the substitute, with the exception that the language would be inserted in section 3, page 4, line 6. Also, the Department is inclined to feel that section 1 (c) of the Flood Control Act of 1944, having to do with consultation with affected States and the Secretary of the Army and providing for comment by those parties, should be applicable to supplemental reports on participating projects, whereas the last sentence of section 1 of the draft bill provides that the section will not be so applicable.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

ROBERT T. STEVENS,
Secretary of the Army.

FEDERAL POWER COMMISSION,
Washington, June 18, 1954.

Re S. 1555 (administration's substitute draft), 83d Congress, 1st session.

Hon. HUGH BUTLER,

*Chairman, Committee on Interior and Insular Affairs,
United States Senate, Washington, D. C.*

DEAR MR. CHAIRMAN: With reference to your request for the views of this Commission on the bill S. 1555, 83d Congress, "to authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes," the Commission desires to bring to the attention of the committee that reports on both the original bill and on the administration's substitute draft bill S. 1555 were submitted to the Bureau of the Budget for clearance.

We have just been advised that there is no objection by the Bureau of the Budget to the presentation of the Commission's report on the administration's substitute draft bill to the Committee on Interior and Insular Affairs. Enclosed herewith are three copies of this report.

Sincerely yours,

JEROME K. KUYKENDALL, *Chairman.*

FEDERAL POWER COMMISSION REPORT ON S. 1555 (ADMINISTRATION'S SUBSTITUTE DRAFT), 83D CONGRESS

A BILL To authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes

Section 1 of the bill would authorize the Secretary of the Interior to construct, operate, and maintain the Echo Park and Glen Canyon units of the Colorado River storage project, consisting of dams, reservoirs, powerplants, transmission facilities, and appurtenant works. It would likewise authorize 11 enumerated participating reclamation and power projects provided that the authority to construct any such participating project shall not become effective until the Secretary has reexamined its economic justification and, accompanied by appropriate documentation in the form of a supplemental report, has certified to the Congress through the President that, in his judgment, the benefits of the project will exceed its costs. Such supplemental reports would not, however, be subject to section 1 (c) of the Flood Control Act of 1944 (58 Stat. 887) which provides that the Secretary of the Interior, in making investigations and reports on works for irrigation and purposes incidental thereto, shall give the affected State or States opportunity to cooperate in the investigations.

Section 2 of the bill declares it to be the intent of Congress to authorize further units of the storage project and new participating projects upon the basis of the data which may be made available to it in the future in accordance with this bill and also in conformity with beneficial consumptive use provisions of article III of the upper Colorado River Basin compact. The costs of any participating projects thus authorized shall be amortized in accordance with the Federal reclamation law and this bill.

Although the Commission does not have sufficient data to enable it to weigh the relative merits of the Echo Park project and alternative projects in terms of their relation to the Dinosaur National Monument, the Commission, based upon a consideration of the power features involved, believes that authorization of the Echo Park and Glen Canyon Dam and Reservoir projects as provided for in this bill is desirable for inclusion in the initial program for future development of the Colorado River Basin. The Echo Park project is favorably located

to assist in serving powerloads of the northerly part of the upper Colorado River Basin, and the Glen Canyon project is favorably located for assisting in serving powerloads to the south. With respect to the participating reclamation and power projects which would be conditionally authorized by the bill, the Commission agrees that such action is very properly made to be dependent upon the findings and recommendations of supplemental detailed reports dealing with their economic and engineering feasibility. The Commission does not feel, however, that the public interest requires or justifies the exemption of such supplemental reports from the opportunity for State cooperation afforded by section 1 (c) of the Flood Control Act of 1944.

Section 4 provides that revenues in excess of operating needs shall be paid annually to the general fund of the Treasury to return the costs of each unit, participating project, or any separable feature thereof which are allocated to commercial power within a period not exceeding 50 years from the date of completion of such unit, participating project, or separable feature thereof. It also provides that revenues in excess of operating needs shall be paid annually to the general fund of the Treasury to return interest on the unamortized balance of the investment (including interest during construction) in the commercial power features of each unit, participating project, or any separable feature thereof at a rate determined by the Secretary of the Treasury as of the time the first advance is made for initiating construction of said unit or project. The repayment provisions correspond generally with the Commission's established practice in analyzing and evaluating Federal multiple-purpose power projects of assuming amortization of power investments in not to exceed 50 years from the "in-service" date, with interest, usually at the rate of $2\frac{1}{2}$ percent.

Section 5 provides that upon completion of each unit, participating project, or separable feature thereof, the Secretary of the Interior shall allocate the total costs of construction of said unit, project, or feature to power, irrigation, or other purposes authorized under reclamation law. The Commission believes that the bill should provide for such cost allocations to be made in conformity with those standards and procedures which may have been established for interagency use at that time.

Section 5 also provides that the Secretary would be required to report to the Congress, on January 1 of each year, beginning with the fiscal year 1955, upon the status of the revenues from and the cost of constructing, operating, and maintaining the Colorado River storage project and the participating projects. The Secretary's report would be prepared to reflect accurately the Federal investment allocated at that time to power, to irrigation, and to other purposes, the progress of return and repayment thereon, and the estimated rate of progress, year by year, in accomplishing full repayment. This requirement of periodic detailed reports on the financial aspects of the proposed improvements appears to be a highly desirable feature.

Section 6 provides that no contract or agreement for the sale of electric power generated at plants authorized by this act shall be made for a period of more than 10 years when such power is disposed of for use outside the States of the upper Colorado River Basin, unless the Secretary of the Interior shall have determined that such power is surplus to the probable needs in such States. All other contracts for the sale of electric power shall be for periods not to exceed 40 years.

Assuming that the Colorado River Basin constitutes the logical market area for the power from the Glen Canyon project, studies by the Commission staff indicate that the power from this project could be utilized in the lower basin in about 10 years from the time that the first unit would become available. Based upon the assumption that the upper Colorado River Basin constitutes the market for the power from Glen Canyon and Echo Park, the staff studies indicate that it would require about 20 years to utilize the power from both projects.

In several statutes (e. g., sec. 5, act of December 22, 1944, 58 Stat. 887, 890; act of July 31, 1950, 64 Stat. 382) Congress has provided that the rate schedules for power sales from certain Federal power projects shall be subject to approval by the Federal Power Commission. The Commission is of the opinion that similar rate control should be provided in this instance and that it should be authorized not only to approve the initial rate schedules, but should have authority to review the rates at appropriate intervals and prescribe those rates which will return to the United States the costs which are properly chargeable to power under the criteria laid down by Congress. If rate supervision is thus given, the Commission is of the further opinion that it should be authorized to make the final allocation of the costs of multiple-purpose projects to the several

purposes as prescribed by Congress. In this connection, the Commission points out that it is not an operating agency, but was created by Congress to act as its agent, a function which is directly related to the rate supervision here recommended.

The Commission favors this legislation as a desirable means for achieving fuller development of the water resources of the upper Colorado River Basin and offers no objection to the administration's substitute draft of the bill, provided it is amended as herein recommended to give the Commission supervision over rates and final authority over cost allocations, and provided further that it is amended as hereinabove suggested to make section 1 (c) of the Flood Control Act of 1944, relating to opportunity for State participation, applicable to supplemental reports of the Secretary of the Interior on participating projects.

FEDERAL POWER COMMISSION,
By JEROME K. KUYKENDALL, *Chairman.*

DEPARTMENT OF AGRICULTURE,
Washington, D. C., June 30, 1954.

HON. HUGH BUTLER,
*Chairman, Committee on Interior and Insular Affairs,
United States Senate.*

DEAR SENATOR BUTLER: This is in reply to your request for a report on S. 1555, a bill to authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes.

The bill would authorize the Secretary of the Interior to construct, operate, and maintain 5 specified initial units of the Colorado River storage project and 15 specified participating projects, consisting of dams, reservoirs, powerplants, transmission facilities, and appurtenant works. It would declare the intent of the Congress to authorize additional units of the Colorado River storage project and new participating projects. All projects would be treated and accounted for as one project. The bill would also provide for creation from revenues of a nonreimbursable special continuing fund to be available for use by the Secretary of the Interior for making studies and investigations relating to the development, conservation, and utilization of the waters of the upper Colorado River Basin. The Secretary of the Interior would be authorized to plan, construct, operate, and maintain public recreational facilities on lands withdrawn or acquired for Colorado River storage project units and participating projects, except on lands in Indian reservations.

The Bureau of the Budget has advised us that the Secretary of the Interior submitted to the Congress on April 1, 1954, a substitute draft bill. This administration substitute draft bill would authorize the Secretary of the Interior to construct, operate, and maintain 2 specified initial units of the Colorado River storage project and 11 specified participating reclamation projects, consisting of dams, reservoirs, powerplants, transmission facilities, and appurtenant works; provided that authority to construct any of the listed participating projects would not become effective until the Secretary of the Interior had reexamined the economic justification of each such project and certified in a supplemental report to the Congress that the benefits therefrom would exceed the costs. Each supplemental report would include (a) a reappraisal of the prospective direct agricultural benefits of the project, made by the Secretary of the Interior in cooperation with the Secretary of Agriculture, and (b) a reevaluation of the nondirect benefits of the project. The bill declares the intent of the Congress in the future to authorize further units of the Colorado River storage project, additional phases of participating projects included in the bill, and new participating projects as additional information becomes available and needs are indicated, and declares the policy of the Congress that costs of any participating project authorized in the future would be amortized from its own revenues to the fullest extent consistent with provisions of the bill and reclamation law. The bill would authorize the Secretary of the Interior to investigate, plan, construct, operate, and maintain public recreational facilities on lands withdrawn or acquired for the Colorado River storage project and participating projects.

Since both S. 1555 and the administration substitute draft bill relate primarily to Department of the Interior authority this Department takes no position regarding enactment of the bills.

However, the Department of Agriculture has a responsibility, commensurate with its national responsibilities, in the agricultural phases of the development, conservation, and utilization of water in the upper Colorado River Basin which would be authorized by such bills. This includes the furnishing of reports to the President and the Congress on the agricultural aspects concurrently with reports by other agencies on other aspects of the proposed developments and the planning, operation, and maintenance of public recreational facilities on those portions of storage project units or participating projects that are within national forest boundaries.

Accordingly, in the event favorable consideration is given to legislation, we recommend (1) that it provide, as the administration draft bill specifically provides for 11 initial participating projects, for cooperation by the Department of Agriculture with the Department of the Interior in the appraisal, before authority to construct projects becomes effective, of the prospective direct agricultural benefits of each proposed project that is expected to produce such benefits; and (2) that it provide that the Secretary of Agriculture shall be granted the same authorities as the Secretary of the Interior under the provisions of section 9 of S. 1555 and section 7 of the administration substitute draft bill when any unit or project is within or partly within the boundary of a national forest.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

E. T. BENSON, *Secretary.*

[H. R. 4449, 83d Cong., 2d sess.]

[Report No. 1774]

A BILL To authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, the Congress, in the exercise of its constitutional authority to provide for the general welfare, to regulate commerce among the States and with the Indian tribes, and to make all needful rules and regulations respecting property belonging to the United States, and for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the upper basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, the control of floods, the improvement of navigation, and the generation of hydroelectric power as an incident of the foregoing purposes, hereby authorizes the Secretary of the Interior (herein called the Secretary) (1) to construct, operate, and maintain the following initial units of the Colorado River storage project, consisting of dams, reservoirs, powerplants, transmission facilities, and appurtenant works: Echo Park, Glen Canyon, and Curecanti: *Provided, however,* That the Curecanti Dam shall be constructed to a height which will impound not less than nine hundred and forty thousand acre-feet of water or will create a reservoir of such greater capacity as can be obtained by a high waterline located at seven thousand five hundred and twenty feet above mean sea level: *Provided further,* That construction of the Curecanti unit shall not be undertaken until the Secretary has, on the basis of further detailed engineering and economic investigations, reexamined the economic justification of such unit and accompanied by appropriate documentation in the form of a supplemental report, has certified to the Congress and to the President that in his judgment, the benefits of such project unit will exceed its costs; and (2) to construct, operate, and maintain the following additional reclamation projects (including power generating and transmission facilities related thereto), hereinafter referred to as participating projects: Central Utah (initial phase), Emery County, Florida, Hammond, LaBarge, Lyman, Paonia (including the Minnesota unit, a dam and reservoir on Muddy Creek just above its confluence with the North Fork of the Gunnison River, and other necessary works), Pine River Extension, Seedskaadee, Silt, and Smith Fork: *Provided,* That construction of any participating project listed in the foregoing clause (2) shall not be undertaken until the Secretary has reexamined the economic justification of such project and, accompanied by

appropriate documentation in the form of a supplemental report, has certified to the Congress and to the President that, in his judgment, the benefits of such project will exceed its costs, and that the financial reimbursability requirements set forth in section 4 of this Act can be met. The Secretary's supplemental report for each such project shall include (a) a reappraisal of the prospective direct agricultural benefits of the project, made by the Secretary after consultation with the Secretary of Agriculture, (b) a reevaluation of the nondirect benefits of the project and (c) allocations of the total cost of construction of each participating project or separable features thereof, excluding any expenditures authorized by section 7 of this Act, for power, irrigation, municipal water supply, flood control or navigation, or any other purpose authorized under reclamation law. Section 1 (c) of the Flood Control Act of 1944 (58 Stat. 887), shall not be applicable to such supplemental reports.

SEC. 2. In order to achieve such comprehensive development as will assure the consumptive use in the States of the Upper Colorado River Basin of waters of the Colorado River system the use of which is apportioned to the Upper Colorado River Basin by the Colorado River Compact and to each State thereof by the Upper Colorado River Basin Compact, it is the intent of the Congress in the future to authorize the construction, operation, and maintenance of further units of the Colorado River storage project, of additional phases of participating projects authorized in this Act, and of new participating projects as additional information becomes available and additional needs are indicated. It is hereby declared to be the purpose of the Congress to authorize as participating projects only projects (including units or phases thereof)—

(1) for the use, in one or more of the States designated in Article III of the Upper Colorado River Basin Compact, of waters of the Upper Colorado River system the consumptive use of which is apportioned to those States by that article; and

(2) for which pertinent data sufficient to determine their probable engineering and economic justification and feasibility shall be available.

It is likewise declared to be the policy of the Congress that the costs of any participating project authorized in the future shall be amortized from its own revenues to the fullest extent consistent with the provisions of this Act and Federal reclamation law.

SEC. 3. Except as otherwise provided in this Act, in constructing, operating, and maintaining the units of the Colorado River storage project and the participating projects listed in section 1 of this Act, the Secretary shall be governed by the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto): *Provided*, That (a) irrigation repayment contracts shall be entered into which, except as otherwise provided for the Paonia and Eden projects, provide for repayment of the obligation assumed thereunder with respect to any project contract unit over a period of not more than fifty years exclusive of any development period authorized by law; (b) prior to construction of irrigation distribution facilities repayment contracts shall be made with an "organization" as defined in paragraph 2 (g) of the Reclamation Project Act of 1939 (53 Stat. 1187, 43 U. S. C. 485) which has the capacity to levy assessments upon all taxable real property located within its boundaries to assist in making repayments, except where a substantial proportion of the lands to be served are owned by the United States; (c) contracts relating to municipal water supply may be made without regard to the limitations of the last sentence of section 9 (c) of the Reclamation Project Act of 1939; and (d), as to Indian lands within, under or served by any participating project, payment of construction costs within the capability of the land to repay shall be subject to the Act of July 1, 1932 (47 Stat. 564). All units and participating projects shall be subject to the apportionments of the use of water between the Upper and Lower Basins of the Colorado River and among the States of the Upper Basin fixed in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, and to the terms of the treaty with the United Mexican States (Treaty Series 994).

SEC. 4. (a) There is hereby authorized a separate fund, to be known as the Upper Colorado River Basin Fund (hereinafter referred to as the Basin Fund), which shall remain available until expended, as hereafter provided, for carrying out the provisions of this Act other than section 7.

(b) All appropriations made for the purpose of carrying out the provisions of this Act, other than section 7, shall be credited to the Basin Fund as advances from the general fund of the Treasury.

(c) All revenues collected in connection with the operation of the Colorado River storage project and participating projects shall be credited to the Basin Fund, and shall be available, without further appropriation, for (1) defraying the costs of operation, maintenance, and replacements of, and emergency expenditures for, all facilities of the Colorado River storage project and participating projects, within such separate limitations as may be included in annual appropriation acts, (2) payment as required by subsection (d) of this section, (3) payment of the reimbursable construction costs of the Paonia project which are beyond the ability of the water users to repay within the period prescribed in the Act of June 25, 1947 (61 Stat. 181), said payment to be made within fifty years after completion of that portion of the project which has not been constructed as of the date of this Act, and (4) payment in connection with the irrigation features of the Eden project as specified in the Act of June 28, 1949 (63 Stat. 277): *Provided*, That revenues credited to the Basin Fund shall not be available for appropriation for construction of the units and participating projects authorized by or pursuant to this Act.

(d) Revenues in excess of operating needs shall be paid annually to the general fund of the Treasury to return—

(1) the costs of each unit, participating project, or any separable feature thereof which are allocated to commercial power pursuant to section 5 of this Act, within a period not exceeding fifty years from the date of completion of such unit, participating project, or separable feature thereof;

(2) the costs of each unit, participating project, or any separable feature thereof which are allocated to municipal water supply pursuant to section 5 of this Act, within a period not exceeding fifty years from the date of completion of such unit, participating project, or separable feature thereof;

(3) interest on the unamortized balance of the investment (including interest during construction) in the commercial power and municipal water supply features of each unit, participating project, or any separable feature thereof, at a rate determined by the Secretary of the Treasury as provided in subsection (e), and interest due shall be a first charge; and

(4) the costs of each unit, participating project, or any separable feature thereof which are allocated to irrigation pursuant to section 5 of this Act, within a period not exceeding fifty years, in addition to any development period authorized by law, from the date of completion of such unit, participating project, or separable feature thereof, or, in the cases of the Paonia project and of Indian lands, within a period consistent with other provisions of law applicable thereto.

(e) The interest rate applicable to each unit of the storage project and each participating project shall be determined by the Secretary of the Treasury as of the time the first advance is made for initiating construction of said unit or project. Such interest rate shall be determined by calculating the average yield to maturity on the basis of daily closing market bid quotations during the month of June next preceding the fiscal year for which said appropriation is enacted, on all interest-bearing marketable public debt obligations of the United States having a maturity date of fifteen or more years from the first day of said month, and by adjusting such average annual yield to the nearest one-eighth of 1 per centum.

(f) Business-type budgets shall be submitted to the Congress annually for all operations financed by the Basin Fund.

Sec. 5. Upon completion of each unit, participating project, or separable feature thereof the Secretary shall allocate the total costs (excluding any expenditures authorized by section 7 of this Act) of constructing said unit, project, or feature to power, irrigation, municipal water supply, flood control, navigation, or any other purposes authorized under reclamation law. Allocations of construction, operation, and maintenance costs to authorized nonreimbursable purposes shall be nonreturnable under the provisions of this Act. On January 1 of each year the Secretary shall report to the Congress for the previous fiscal year, beginning with the fiscal year 1955, upon the status of the revenues from and the cost of constructing, operating, and maintaining the Colorado River storage project and the participating projects. The Secretary's report shall be prepared to reflect accurately the Federal investment allocated at that time to power, to irrigation, and to other purposes, the progress of return and repayment thereon, and the estimated rate of progress, year by year, in accomplishing full repayment.

Sec. 6. The hydroelectric powerplants authorized by this Act to be constructed, operated, and maintained by the Secretary shall be operated in conjunction with

other Federal powerplants, present and potential, so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates, but no exercise of the authority hereby granted shall affect or interfere with the the operation of any provision of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Readjustment Act, or any contract lawfully entered into under said Acts without the consent of the other contracting parties. Neither the impounding nor the use of water for the generation of power and energy at the plants of the Colorado River storage project shall preclude or impair the appropriation for domestic or agricultural purposes, pursuant to applicable State law, of waters apportioned to the States of the Upper Colorado River Basin.

SEC. 7. In connection with the development of the Colorado River storage project and of the participating projects, the Secretary is authorized and directed to investigate, plan, construct, operate, and maintain (1) public recreational facilities on lands withdrawn or acquired for the development of said project or of said participating projects, to conserve the scenery, the natural, historic, and archeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects by such means as are consistent with the primary purposes of said projects; and (2) facilities to mitigate losses of and improve conditions for the propagation of fish and wildlife. The Secretary is authorized to acquire lands and to withdraw public lands from entry or other disposition under the public land laws necessary for the construction, operation, and maintenance of the facilities herein provided, and to dispose of them to Federal, State, and local governmental agencies by lease, transfer, exchange, or conveyance upon such terms and conditions as will best promote their development and operation in the public interest. All costs incurred pursuant to this section shall be nonreimbursable and nonreturnable.

SEC. 8. Nothing contained in this Act shall be construed to alter, amend, repeal, construe, interpret, modify, or be in conflict with, any provision of the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774), the Colorado River Compact, the Upper Colorado River Basin Compact, or the Treaty with the United Mexican States (Treaty Series 994).

SEC. 9. Expenditures for the Glen Canyon and Echo Park units of the Colorado River storage project may be made without regard to the soil survey and land classification requirements of the Interior Department Appropriation Act, 1954.

SEC. 10. Construction of the projects herein authorized shall proceed as rapidly as is consistent with budgetary requirements and the economic needs of the country.

SEC. 11. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be required to carry out the purpose of this Act but not to exceed \$1,000,000,000.

SEC. 12. 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 of the Colorado River, of all transmountain diversions of water of the Colorado River System and of all other storage and reclamation projects in the Colorado River Basin.

SEC. 13. In the operation and maintenance of all facilities, authorized by Federal law and under the jurisdiction and supervision of the Secretary of the Interior, in the basin of the Colorado River, the Secretary of the Interior is directed to comply with the applicable provisions of the Colorado River Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, and the Treaty with the United Mexican States, in the storage and release of water from reservoirs in the Colorado River Basin. 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.

SEC. 14. As used in this Act—

The terms "Colorado River Basin", "Colorado River Compact", "Colorado River System", "Lee Ferry", "States of the Upper Division", "Upper Basin", and "domestic use" shall have the meaning ascribed to them in Article II of the Upper Colorado River Basin Compact:

The term "States of the Upper Colorado River Basin" shall mean the States of Arizona, Colorado, New Mexico, Utah, and Wyoming;

The term "Upper Colorado River Basin" shall have the same meaning as the term "Upper Basin";

The term "Upper Colorado River Basin Compact" shall mean that certain compact executed on October 11, 1948, by commissioners representing the States of Arizona, Colorado, New Mexico, Utah, and Wyoming, and consented to by the Congress of the United States of America by Act of April 6, 1949 (63 Stat. 31); and

The term "treaty with the United Mexican States" shall mean that certain treaty between the United States of America and the United Mexican States signed at Washington, District of Columbia, February 3, 1944, relating to the utilization of the waters of the Colorado River and other rivers, as amended and supplemented by the protocol dated November 14, 1944, and the understandings recited in the Senate resolution of April 18, 1945, advising and consenting to ratification thereof.

Amend the title so as to read: "A bill to authorize the Secretary of the Interior to construct, operate, and maintain initial units of the Colorado River storage project and participating projects and for other purposes."

Senator MILLIKIN. I recognize the Senator from Wyoming.

**STATEMENT OF HON. FRANK A. BARRETT, A UNITED STATES
SENATOR FROM THE STATE OF WYOMING**

Senator BARRETT. Thank you, Mr. Chairman. I appreciate your courtesy of allowing the Wyoming delegation to take a few moments at the opening of this hearing.

I ask that privilege mainly because in the first instance the Governor of Wyoming is here and he must go back to Wyoming late this afternoon or early in the morning. He came down here to put in an appearance at this hearing and also to intercede with the Department of Agriculture on a matter of drought relief in our State.

Mr. Chairman, also he will witness the swearing in of the Senator-designate from our State, E. D. Crippa of Rock Springs, who has long supported this project and who lives in the heart of the project in Wyoming.

Now, Mr. Chairman, I wish to take this opportunity to present to the committee the Honorable C. J. "Doc" Rogers, the Governor of Wyoming. The Governor has asked me to say a few words in his behalf, that he is wholeheartedly in favor of this project and the entire project. He is in favor of the Echo Park unit of the project because he believes that it is of utmost importance that that project be constructed, first so that the water can be stored to fulfill our contract with the lower basin States on the Colorado River and, secondly, to develop power that is so badly needed in not only southern Wyoming, but throughout the Upper Colorado River States.

Mr. Chairman, Governor Rogers wants to insert in the record his wholehearted support of this project. He wants to say that he has his State engineer here to testify.

The Governor, I think will take a minute or two now to address the committee.

Senator MILLIKIN. We are delighted to have you here. You are here on several very worthwhile missions.

**STATEMENT OF HON. C. J. ROGERS, GOVERNOR OF THE STATE OF
WYOMING**

Governor ROGERS. I join my Senators 100 percent.

Senator BARRETT. Now, Senator Millikin, it is my great honor to present to you for his first appearance before a committee as a Senator designate, the Honorable E. D. Crippa, who will be sworn in at

noon today as a Senator from Wyoming, succeeding the late Senator Lester C. Hunt. Senator Crippa was born and reared in Wyoming. He has large business interests in Sweetwater County, and Rock Springs, his hometown, and he has been fighting the battle for the upper Colorado River for a long time, when it was first in its planning stages. He would like to take a few moments to make a statement at this time.

Senator MILLIKIN. We will call you Senator, as it will not be long now.

We are glad to have you here.

STATEMENT OF HON. E. D. CRIPPA, UNITED STATES SENATOR FROM THE STATE OF WYOMING

Mr. CRIPPA. It is very fortunate for me, Mr. Chairman, that my first statement as Senator from Wyoming should be to speak in behalf of the Colorado River storage bill. Nothing is more important to the people of my hometown or of my State than the early construction of this project and the Wyoming units. I would like at the outset to repeat the position of the people of the West on the matter of the development of our Nation's resources.

No reasonable person can deny that wherever our water resources have been developed, either for irrigation and reclamation or power, new wealth has been brought to the immediate area. This has resulted in a broader tax base, new markets for industrial areas and supplemented the Nation's diet.

For many years I have worked toward fullest development of western resources. The Colorado River storage project, of which the Echo Park Dam and its 13 participating units in Colorado, New Mexico, Wyoming, and Utah are a part, definitely would add further proof to the truth I have just mentioned.

The overall project will open to irrigation 380,000 acres of land and bring about the generation—through its power phases—of large blocks of vitally needed hydroelectric power for the five-State area.

The project will enable the upper basin States to deliver 75 million acre-feet of water every 10 years to the lower States, and still provide beneficial use of nearly an equal amount. It will serve as a guarantee that the upper States will not lose their priority to their own water by failure to put those waters to beneficial use.

The project will mean much for my own State of Wyoming since it includes four participating units.

Briefly these units—LaBarge, Lyman, Seedskaadee, and Eden—will cost nearly \$43 million. An expenditure of this size in the southwestern part of my State will go a long way to bolster business and agriculture now and in the years ahead. This particular area is undergoing some economic changes brought about by technological progress. Development of new industries as a result of the construction of the project can be expected to lead the way to providing nearby markets for Wyoming's vast coal deposits whose future use depends upon markets for the chemicals which can be extracted from them by various processes. Currently we are looking forward to such use of our coal and the reemployment of persons dependent on the coal industry.

Construction of the 4 projects within Wyoming will bring irrigation water to 79,390 acres of land for the first time, and supplemental

water to 49,900 acres now under irrigation. This would give our ranching and livestock industry a much-needed shot in the arm. In this connection I would like to suggest that the overall project include the proposed Kendall Reservoir project near the headwaters of the Green River in Wyoming. It is necessary before Wyoming can apply its 14-percent allocation under the Colorado River compact. It would provide supplemental water for the four participating units in Wyoming under the overall plan, and is needed in connection with those projects.

Further study of this 340,000-acre-foot reservoir project is needed to determine the possibility of providing storage to increase project acreage on the Seedskaadee project.

The four participating units, not including the Kendall project which I just referred to, would cost as follows: Eden, \$7,287,000; Seedskaadee, \$23,272,000; Lyman, \$10,564,000; and LaBarge, \$1,673,000.

Irrigation possibilities of the 4 units would be: LaBarge, 7,670 acres new irrigation and 300 acres of supplemental; Lyman project, 40,600 acres of supplemental; Eden, 11,000 acres of new and 9,000 supplemental; and Seedskaadee, 60,720 acres of new. The Eden project—already authorized and under construction—involves construction of a 40,000-acre-foot storage reservoir on the Big Sandy, and the Lyman unit contemplates construction of a 43,000 acre-foot storage reservoir.

The Colorado River storage project as envisioned in this legislation with its participating units in Wyoming is the cornerstone to the entire development of the upper Colorado River Basin watershed in southwestern Wyoming. It will enable Wyoming to make full use of its proportionate share of Colorado River Basin water agreed to by the upper Colorado River Basin States.

As to the charge that it is a threat to the prehistoric values of Dinosaur National Monument, I can only state that so far I have not been convinced such a threat exists.

Mr. Chairman, I have a resolution here, passed by the Sportsmen's Federation of the State of Wyoming, and it so states:

To Whom It May Concern:

The Wyoming Federation of the Sportsmen's Clubs at its State convention passed a resolution urging construction of the Echo Park Dam.

I offer that for the record.

Senator MILLIKIN. Senator, may I ask, Is that a statewide organization?

Mr. CRIPPA. Yes, sir.

Senator MILLIKIN. This committee is honored to have your first appearance in the Senate before this committee.

Mr. CRIPPA. Thank you, and I am very honored, I assure you.

(The letter of June 24, 1954 follows:)

WYOMING FEDERATION OF SPORTSMEN'S CLUBS,

June 24, 1954.

To Whom It May Concern:

The Wyoming Federation of Sportsmen's Clubs at its State convention passed a resolution urging the construction of the Echo Park Dam project.

JOHN C. BORZEA, *Secretary.*

This is to certify that John C. Borzea is secretary of the Wyoming Federation of Sportsmen's Clubs, State of Wyoming and did sign the above statement.

[SEAL]

CARL F. ASIALA,

City Clerk, City of Rock Springs, Rock Springs, Wyo.

Dated this 25th day of June 1954.

Senator MILLIKIN. Senator Johnson?

Senator Johnson of Colorado is cosponsor of this bill.

**STATEMENT OF HON. EDWIN C. JOHNSON, A UNITED STATES
SENATOR FROM THE STATE OF COLORADO**

Senator JOHNSON. Mr. Chairman and members of the committee, I am very grateful to you for permitting me to testify early in the hearings. I have already attended one committee meeting this morning, and I have another that is very pressing. So I appreciate the convenience of this opportunity to speak to this committee.

Senator MILLIKIN. We are very glad to have you, sir.

Senator JOHNSON. Mr. Chairman and members of the committee, I desire to make a statement with respect to S. 1555, the pending legislation providing for storage projects to be constructed in the upper Colorado River Basin. This vast basin comprises an area of more than 110,000 square miles. It includes the southwest corner of Wyoming, the northwest corner of New Mexico, the northeast corner of Arizona, eastern and southern Utah, and the western half of Colorado. Generally speaking, it is rough, mountainous country interspersed with high plateaus and deep canyons, and famous for its scenic attractions. It is sparsely populated, having an average density of three persons per square mile, who for the most part reside in its many rather narrow but rich river valleys.

For many years my home has been in the Colorado section of this basin and I am quite familiar with the geography, topography, geology, potentialities, and aspirations of this portion of the Colorado River Basin. Since Colorado produces more than 72 percent of the water of the upper Colorado River Basin, its citizens have an important stake, interest and concern in S. 1555.

The purpose of the Congress in expending vast sums of public money on this river is to convert a menacing and wastrel river into a great national resource. The projects necessary to develop, regulate, and control the Colorado River are so huge that only the Federal Government has the capital and the capacity to undertake it. That fact places a heavy responsibility on the Congress to see that whatever projects it builds do not give one State or one region undue advantage over other States and other regions. We must bear in mind that neither the States nor their citizens have the financial capacity to do much about this river's development; and yet, if harnessed, it will pay back to the Federal Government every penny expended in its development and, after paying back all of such a capital investment, this harnessed river will continue to bless mankind for thousands of years.

To get a clear picture of the problem of the development of the Colorado River, one must recognize that there are two very distinct Colorado River basins in the United States, plus an area in Mexico, having an established legal claim to a portion of its water.

The lower basin includes California, Nevada, and Arizona. While California does not contribute any water to the Colorado River, she has a great need for the power which the harnessed river can provide and for the water it can conserve, both of which must be transported by transmountain diversion out of the basin.

The States in the lower basin were pressing to develop their part of the Colorado River system before the upper basin States were ready to undertake their own development. However, under the law the first to put public water to beneficial use gains a vested right in that water. This is in accord with the legal principle of "first in use, first in right." In order to permit lower-basin development to proceed without prejudice to the development of the upper basin at some later period, a division of the water as between the upper and lower basins was determined in 1922 by a seven-State compact.

Since this compact set aside the right of title to the water going to the first to put it to beneficial use, the upper States have felt safe to cooperate with the lower States in developing the water in the lower basin first. The upper basin States have relied on the good faith of all seven States, and the compact which all signed to protect them and permit the development of both basins as Congress made Federal funds available without regard to where the first funds might be spent.

Accordingly, the Congress already has spent huge sums in developing the lower basin, but little or nothing in the upper basin, which produces practically all of the water of this great stream. The first step in bringing the river under control was the construction of the Hoover Dam. I emphasize again that all of the funds so far invested in this river have been Federal moneys and not lower basin moneys.

In reviewing this historic data, I am grieved to now note that the California Official Board of the Colorado River has taken a strong position against the development of the upper Colorado River Basin and that all but one California Congressman on the House Interior Committee have joined in that opposition.

The one California Congressman who so far takes exception to this breach of good faith is Hon. Clair Engle, and I mean honorable. Congressman Engle points out that California is not serving her own best interests in pursuing such a selfish attitude toward her generous neighbors. But California has great political strength in the House. If she uses that strength to block development of the upper basin and does block it, practically all the water of this river not now being used will be available to the lower States and none of it to the upper States. While under the 7-State compact the upper basin has both the law and justice and equity on its side, yet if California succeeds in keeping Congress from authorizing the funds to develop the upper basin, we cannot put to use the additional portion of the water we produce which will require Federal funds and to which we have the right under the 7-State compact.

Thanks to the Founding Fathers, there is no power that can compel Members of Congress to support or not support any legislative proposals—and this is a legislative proposal—just as was the 7-State compact and the appropriation of Federal funds which have developed the lower basin. The upper basin has righteousness in her corner but the lower basin will have all the water of the Colorado River in perpetuity, unless the Congress is fair to both basins in the appropria-

tion of funds for the equal development of both basins, as contemplated in the 7-State compact.

When the 7-State compact was negotiated it was estimated that the production of the Colorado River in any 10-year period would be greater than 150 million acre-feet. The attorneys and experts formulating the provisions of the compact tried to divide this water "even steven" between the upper and lower basins. Unfortunately, however, they did not split the water of the river on a percentage basis, giving each basin 50 percent of whatever water was produced. Had they done so, there would be no serious problem before this committee today. The flow of the river for 10-year periods was overestimated by 25 million acre-feet, and the 7-State compact of 1922 allocated 75 million acre-feet to the lower basin and obligated the upper basin to deliver that amount of water to the lower basin at Lee's Ferry in each 10-year period. However, that is water over the dam now and nothing can be done about it. So, regardless of the quantity of water produced, the upper basin is stuck with the obligation to deliver 75 million acre-feet at Lee's Ferry in each 10-year period.

The last 10-year period from 1941 to 1951, for which the Bureau of Reclamation has figures, the flow of the Colorado River was 124,252,000. Under the 7-State compact, the lower basin's share for this 10-year period would be 75 million acre-feet, or 60 percent of the total flow of the river, and the upper basin's share would be roughly 50 million acre-feet, or 40 percent of the flow of the river. The present indications of the flow of the river for the 1951-61 period is that the flow will fall below a total of 120 million when the upper basin's share will be 37½ percent or less, and the lower basin's share 62½ percent or more. Nevertheless, the grasping California Official Board is still not satisfied with its 62½ percent split. She wants 100 percent of the Colorado River water without herself producing one drop; and, what is more, she will get the 100 percent if she can keep Congress from authorizing Federal funds to develop the upper basin on a fair, just, comprehensive, and equitable basis.

In 1945 the United States signed a treaty with Mexico in which the United States agreed to deliver to Mexico for her consumptive use \$1,500,000 acre-feet of water annually. This water is to be charged to any surplus water which might be in the Colorado River system; but if there be no surplus water in the Colorado River system, then the burden of providing the necessary water will fall equally on the lower and upper Colorado River Basins.

On October 11, 1948, at Santa Fe, N. Mex., following preliminary meetings at Vernal, Utah, and other points in the upper basin, a compact among the five States having areas in the upper basin was executed.

Comprising 21 articles in all, the document is written around an apportionment made in article 111 thereof, as follows: This surplus water, this unallocated water, is on the State's lower borders and not in the high mountain area of Colorado.

(The data referred to follow:)

The use of water as such use is apportioned in perpetuity to the upper basin and available for use by the States of the upper basin under the Colorado River compact is hereby apportioned among the States of the upper basin in perpetuity subject to the provisions and limitations appearing in the Colorado River compact and in this compact, as follows: To the State of Arizona the consump-

tive use of 50,000 acre-feet annually, and the remainder to the States of Colorado, New Mexico, Utah, and Wyoming in the following proportions.

	Percent		Percent
Colorado-----	51.75	Utah-----	23.00
New Mexico-----	11.25	Wyoming-----	14.00

The apportionment to each State includes all water necessary for the supply of any rights which now exist.

Colorado has signed compacts with the lower basin States and with the upper basin States. Under the terms of these compacts and the treaty with the United States of Mexico, Colorado has (in addition to the water now put to beneficial use) 1,347,000 acre-feet of unallocated water for consumptive use in the State of Colorado, as illustrated by the following table:

	<i>Acre feet</i>
Colorado delivers annually to the lower States in the Colorado Basin approximately-----	9,347,000
Dedicated by 7-State compact to lower basin-----	5,600,000
Dedicated by Santa Fe compact to Utah, New Mexico, and northeastern Arizona-----	1,585,000
Dedicated by treaty to Mexico-----	375,000
Colorado share of evaporation of upper basin storage projects when built-----	440,000
Total downstream burden on the State of Colorado-----	8,000,000
Maximum quantity of unallocated water available for consumptive use in Colorado-----	1,347,000

Senator JOHNSON. These figures are based on the Bureau of Reclamation figures on the annual production of water in the Colorado River drainage area in the State of Colorado; Bureau figures on the actual stream flow of the Colorado River at Lees Ferry for the 10-year period of 1941-51; and Bureau figures on the total evaporation annually of the 10 storage reservoirs which they have recommended for construction in the upper Colorado Basin. These calculations are also based on the irrevocable terms of the treaty with Mexico, and the stipulations of the 7-State compact of 1922 and the 5-State Santa Fe compact of 1948. I invite the Bureau of Reclamation or anyone interested in these statistics to apply the fixed factors which are or will be present, and the terms of irrevocable compacts and treaties, and show that I have overestimated the total maximum unallocated water remaining in the Colorado Basin for consumptive use in the State of Colorado.

These dispositions of Colorado-produced water affect Colorado's western slope as a whole. But these out-of-State burdens have not been allocated among her four watersheds. These watersheds may be defined roughly as the San Juan, the Gunnison, the Brand, and the Green-White-Yampa Basins. If the use and conservation of the water of these basins are developed simultaneously, each will bear its proportionate share of the downstream burden established by the irrevocable compacts which the State of Colorado has entered into with the other States of the upper and lower basins of the Colorado River.

If one of these basins in the State of Colorado lags in the use, conservation, and development of its water, then it follows that that basin must bear a disproportionate share of the delivery of water to fulfill Colorado's commitment downstream.

The cold facts are that the Green-White-Yampa Basin is far behind the other three basins in the use, conservation, and development of

its water. Under this present authorization bill it will lose all right to all of its remaining unallocated water, and all of its potential for future water development, unless safeguards in the way of reservations and guaranties are established in the pending legislation.

If something is not done now the Green-White-Yampa Rivers will be obligated in perpetuity to deliver all of their water downstream to satisfy the commitments the State of Colorado had consummated in irrevocable compacts. In a lesser degree, all of our watersheds face that danger, too. The pending legislation can either cure or aggravate this material threat of gross inequality to important sections of the western slope. In fact, it is incumbent on the Congress in this bill to resolve the very serious problem of an equitable division of the waters of the western slope of Colorado. If the pending measure is enacted as it now reads, all four basins of the western slope will be thrown into a state of uncertainty, suspicion, inequities, and cutthroat competition to obtain priority to its share of its water by priority of development.

Any worthy plan for the development of the upper Colorado River Basin should encompass and visualize in the plan a complete development of the whole upper basin at one time, and not plan it piecemeal as the present bill does. Projects must be built one at a time, but they should be planned together. Since the basic law of "first in use, first in right" prevails, provisions in the authorization must be made to insure the future equitable development of the four basins in Colorado, if distortion and inequities are not to be the result.

No one expects all the projects on the upper Colorado to be built simultaneously. There probably will be a 30-year lag between the first construction and the last, but if the last is protected in the law now, the last project in the last of the four watersheds on the western slope of Colorado will have its rights preserved.

In this connection I want to call attention to pertinent portions of the upper basin compact. Article V—Upper Basin Compacts:

(b) All losses of water occurring from or as the result of the storage of water in reservoirs constructed after the signing of this compact shall be charged as follows:

"(1) * * * The whole or that portion, as the case may be, of reservoir losses as found by the Commission to be reasonably and properly chargeable to the reservoir or reservoir capacity utilized to assure deliveries at Lee Ferry shall be charged to the States of the upper division in the proportion which the consumptive use of water in each State of the upper division during the water year in which the charge is made bears to the total consumptive use of water in all States of the upper division during the same water year."

Accordingly, Colorado is charged with approximately 51.75 per cent of the loss by evaporation of the Glen Canyon, Echo Park, Cross Mountain, and all other storage projects that may be built on the upper Colorado River.

Article XIII—Upper Basin Compact: Subject to the provisions of this compact, the rights to the consumptive use of the water of the Yampa River, a tributary entering the Green River in the State of Colorado, are hereby apportioned between the States of Colorado and Utah in accordance with the following principles:

(a) The State of Colorado will not cause the flow of the Yampa River at the Maybell gaging station to be depleted below an aggregate of 5 million 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 and approval of this company.

Since the average annual flow of the Yampa River at the Maybell gaging station is 1,160,000 acre-feet, it should be plain from the above provision that half of that flow is dedicated to use in Utah.

An excellent feature of the plan to develop the upper Colorado River Basin is the very vital provision that water uses for power are subservient to uses for irrigation and domestic purposes. Under such a provision never can storage reservoirs downstream call on Colorado for delivery of water which Colorado has a right to use for irrigation and domestic purposes.

Even though the powerplants downstream are built earlier than facilities upstream are constructed for irrigation and domestic purposes, the subsequent upstream consumptive uses in Colorado cannot thereby be affected.

A person not studying my statement up to this point might feel I am doing a little doubletalk, but I am not. When I refer to the demands on Colorado water downstream, I was referring to the demands in the compacts and in the treaty with Mexico. I am not afraid of the powerplants that are being built downstream having any such demand because there is a provision in this bill which states that domestic and irrigation purposes shall have priority over storage and power purposes.

During the past year a bitter controversy has been raging between the Colorado east and west slope residents. Obviously this dispute cannot and ought not to be resolved by Congress. It can and must be settled in Colorado by reasonable men of both slopes willing to analyze all factors without bitterness or name-calling. The eastern slope contends that there is an unallocated surplus of public water in the Colorado Basin. The western slope maintains that the exact quantity and location of such water is unknown and that the full potential requirements of the western slope have not been fully considered.

At any rate, this dispute in Colorado, Mr. Chairman, ought not to block or delay or handicap in any way the progress of this legislation, and I am sure that it will not.

There are two very different types of projects in the upper basin of the Colorado River which will be authorized by S. 1555. One is "storage projects," the other "participating projects." Storage projects have as their purpose the regulation of the streamflow and insurance to the lower basin that it will receive its stipulated quantity of water as the water is required. I have pointed out already that the lower basin under the seven-State compact has been awarded the lion's share of the streamflow. Now it is proposed in this legislation to deliver this water in an even and regular flow in dry cycles and wet cycles through the years.

I would be far more enthusiastic about S. 1555 if it were to authorize the construction of all of the participating projects in the upper basin first, and afterward regulate the flow of the river downstream. The upper States needs to have the water to which they are entitled now. It is their turn to have irrigation projects built. The lower basin already has Lake Mead which insures it the water it needs when it needs it. Now the upper States should have their reservoirs constructed.

It is not planned that way, however, and S. 1555 does not so provide. The first project to be built is the Glen Canyon Dam.

This storage reservoir would be located on the Colorado River in Arizona about 13 miles downstream from its northern State line and approximately 15 miles upstream from Lee Ferry. It would have a total capacity of 26 million acre-feet. When filled it would have a maximum water surface area of 153,000 acres and form a lake 187 miles long. It would produce annually over 3 billion kilowatt-hours and have a generating capacity of 800,000 kilowatts. It would have an evaporation of 526,000 acre-feet annually. It would catch 100,000 acre-feet of silt which normally would be delivered to the lower basin States at Lee Ferry and be measured as water.

526,000 acre-feet of evaporation plus 100,000 acre-feet of sedimentation annually adds up to a loss at Lee Ferry of 626,000 acre-feet annually, which without the construction of the Glen Canyon Dam would flow directly into Lake Mead and be credited to the upper basin States as water delivered under the 1922 compact.

Another interesting observation: Under the 1948 compact, 320,000 acre-feet of that loss would be charged annually to the State of Colorado as water consumed by it.

This huge dam will cost the upper basin \$421 million to build. It is hoped that through the sale of power this cost can be liquidated in 25 to 40 years. After its construction costs have been repaid, the project would pay something toward the development of the upper basin.

Glen Canyon should add 500 years to the life of Lake Mead, and that is a worthwhile contribution to the lower basin and fully justified, but in those 500 years it will have cost the upper basin States 313 million acre-feet of water in evaporation and silt deposits without any cost whatever to the lower basin.

It will insure the lower States their full share of the water of the Colorado River which was allocated to them by the compact of 1922, regardless of how little water the upper basin States may produce. In other words, it is fully justified by the contribution it renders the lower States, and not for any contribution it renders to the upper basin States. It is so essential to the lower basin that if the upper basin would not build it the lower basin would have to do so.

Altogether, there are 10 storage reservoirs contemplated, of which Glen Canyon is the largest by far. In fact, it will have more than twice the capacity of all the others added together. It is the sort of project that engineers dream about.

These facts were supposed to appease the California "Colorado River Board" and make the development of the upper basin acceptable to them, but it has not had that effect. Congressman Engle from California was correct when he told this board that in their relentless opposition to Glen Canyon they were not serving their own best interests.

I shall not discuss the other storage projects except to name them in the order of their feasibility as I understand them: Glen Canyon, Echo Park, Cross Mountain, Split Mountain, Flaming Gorge, Currecanti, Gray, Crystal, and White Water.

Now I shall list participating projects in Colorado which do not appear in S. 1555. It is my considered judgment that if these projects are not specifically authorized in this legislation now they may never have an opportunity to be constructed. I shall not name them in the

order of their preference, but will start in the southern part of the State and move northward.

Dolores project: The McPhee Reservoir with a total capacity of 328,000 acre-feet and an active capacity of 153,000 acre-feet on the Dolores River. The dam will be 10 miles downstream from the town of Dolores. It would provide supplementary water for the Montezuma Valley and new irrigation water for the Dove Creek area.

The Gunnison River project, consisting of the following units: Fruit Growers Dam project extension, Tomichi Creek, Cochetopa Creek, East River, Ohio Creek, Cebolla Creek, Gateway, Pine Creek, Fruitland, Bostwick Park, Goddard Mesa, Grand Mesa, North Delta, Dallas Creek, and Kannah Creek.

Cliffs-Divide project, consisting of the following units: Fraser, Parshall, Troublesome, Rabbit Ear, Straight Creek, Cateract Lake, Harsha, Toponas, Burns, Eagle-Divide, Pando, Gypsum, Woody Creek, Cattle Creek, West Divide, Parachute, Roan Creek, Bluestone, and Battlement Mesa.

Crystal River project, consisting of the following units: Redstone and Placita. Trappers Lake project; Meeker project, 12 miles downstream from the town of Meeker; Upper Bear project on Yampa River; Juniper Reservoir project; and Savery-Pot Hook project.

All of these projects are on the western slope of Colorado. I will submit an amendment to S. 1555 providing for their inclusion. I hope that this amendment may have favorable action by the committee. It is very important that Colorado have some recognition in this bill for the beneficial use of its participating reservoirs, over and above what now appear in the bill.

I want to thank the chairman for this opportunity. It has been of great convenience to me, and I appreciate this opportunity to appear early.

Senator MILLIKIN. We appreciate your appearance, Senator. Thank you very much.

The next witness is Mr. Geoffrey Will, secretary and general counsel to the Upper Colorado River Commission.

STATEMENT OF JOHN GEOFFREY WILL, SECRETARY AND GENERAL COUNSEL, UPPER COLORADO RIVER COMMISSION

Mr. WILL. I want to express my appreciation, Mr. Chairman, and gentlemen for the courtesy of you, yourself, and your colleagues in arranging for these hearings, notwithstanding an extremely busy schedule.

Senator ANDERSON. Mr. Chairman, the rule is that we must have a copy of the statements submitted to us many hours in advance so we have a chance to study them. Can we start to enforce the rule on some of these witnesses so we have a chance to know what they are going to testify about? I am not directing that at Mr. Will, because he knows I am a staunch supporter and friend of his. Therefore, I can bring it up better with him than I can with the next person.

Mr. WILL. Nevertheless, I think I am guilty of a violation of that rule, and I apologize for it.

Senator ANDERSON. Can we have copies now?

Mr. WILL. Don't we have them distributed now?

Senator ANDERSON. No; we do not have any copies.

Mr. WILL. There are copies of my statement up there.

Senator KUCHEL. Mr. Chairman, while the copies are being distributed, may I make an inquiry? I am not a member of your subcommittee, Mr. Chairman, and I feel a little lonely here as I look around the table and the members of the subcommittee are pretty much in sympathy with the legislation before you.

I wonder, however, representing the State of California as I do, if the chairman and the committee would permit an opportunity for my inquiring of the various witnesses who appear. Would that be in order, Mr. Chairman?

Senator MILLIKIN. Yes, you may do so.

Do you have copies now, Senator Anderson?

Senator ANDERSON. Yes.

Senator MILLIKIN. You may proceed.

Mr. WILL. The Upper Colorado River Commission is an interstate administrative body created by the upper Colorado River compact. Represented on our commission are the States of Colorado, New Mexico, Utah, and Wyoming. Because of its comparatively slight land area in the upper basin, Arizona is not represented on the Commission. The compact provides that, if a commissioner representing the United States of America is designated, he shall be the presiding officer of the Commission and shall be entitled to the same powers and rights as the commissioner of any State.

Mr. Chairman, just recently the President appointed the Honorable Robert J. Newell, retired regional director of the Bureau of Reclamation at Boise, Idaho, as the commissioner for the United States on our Commission. Mr. Newell is with us today. He will, however, not be asked to testify, because he has not had time fully to familiarize himself with our problems.

While the Federal Government has extensive responsibilities and duties in the field of water resources development, these responsibilities and duties are not exclusive. If we are to achieve the most beneficial results in the conception and in the administration of programs in this field, we dare not overlook the role of the States themselves and the need to coordinate the efforts of the Federal Government with those of the State governments concerned. On December 22, 1944, there was spelled out in our law the fundamental policy of recognizing "the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control * * *" You, Mr. Chairman, were among the leaders in securing the enactment of that policy which is of such vital importance to the 17 Western States.

The proposals now before you in S. 1555, for authorization of the Colorado River storage project and participating projects, are the product of the very kind of determination of which this policy speaks; and our presence here today in company with the officials of the Interior Department and of the Bureau of Reclamation is evidence of the community of interest of the Federal and State Governments concerned in the development of the water resources of the Colorado River Basin. It is, in fact, evidence of that "close Federal-State cooperation" to which the President referred in his recent statement regarding the Colorado River storage project and participating projects.

In the case of works projected within one State alone, even though they be connected with the use of waters of a stream in which other States have an interest, the problem of coordination and cooperation between Federal and State Government is not as complex as it is in the case of works projected for several States. Take the problem of development of the water resources of the upper Colorado River Basin. Here we have a case where investigations themselves have been carried out for many years, in close cooperation with the governments of 5 States. These investigations resulted in a so-called inventory report, identified as House Document 419, 80th Congress. In effect, this report showed that there are many more opportunities for the utilization of the water resources of the upper Colorado River Basin than there is water available. You will recall that the Colorado River compact of 1922 apportions the consumptive use of waters of the Colorado River system between 2 areas respectively known as the upper basin and the lower basin. It became necessary then for the upper Colorado River Basin States to negotiate and enter into a compact apportioning among themselves the use that was apportioned to them as a group by the Colorado River compact of 1922. It became necessary to do this before the Interior Department could proceed further with the evolving of plans for the development, conservation and use of the upper basin's water resources. A compact accomplishing this purpose was executed at Santa Fe, N. Mex., on October 11, 1948, and subsequently consented to by the Congress. Plans for a project known as the Colorado River storage project and participating projects were then put into more definitive form and circulated to all the affected States and agencies. These plans now lie before the Congress of the United States in S. 1555.

It is important to bear in mind that the overall plans for development, conservation, and use of the water resources of the upper Colorado River Basin are not final and definitive in all respects. There are certain areas of the upper basin for which we hope you will by law lay down general guides within which definitive plans may be worked out. It is our hope, for instance, that the Congress will, in general terms, provide the framework within which there may, in due course, be created substantial storage on the upper reaches of the Colorado River, above Grand Junction, Colo. It is our hope, also, that the Congress will, in general terms, provide the framework within which there may be evolved definitive plans for the proposed San Juan-Chama diversion, in New Mexico, and for the developments in the South San Juan area for whites as well as Indians.

Certainly, those areas of the upper basin States for which final and definitive plans have not been worked out ought to be assured that they are not overlooked; and to the extent that it is practicable to do so at this time, works for the development, conservation, and use of their water resources should be authorized, subject to the demonstration of their feasibility in due course.

If, in one case or another such conditional authorization is deemed impracticable, then recognition ought nevertheless to be extended in some appropriate way to the legitimate aspirations of areas and sections, for which definitive plans have not been made, to develop and to prosper with use of a share in the waters of the Colorado River system.

It should be made abundantly clear that congressional approval is given to a program of development for these areas, in spite of the fact that the details of such a program remain to be worked out.

There is an analogy between our concern for the full protection of those areas in the upper basin for which definitive plans have not yet been worked out and one of the basic purposes of the Colorado River compact of 1922.

The basic purpose was to assure that the States with areas on those reaches of the Colorado River and its tributaries above Lee Ferry would, in due course, be entitled to share equitably in the use of its waters. Such assurance was a condition precedent to the authorization of the Boulder Canyon project.

The evidence which follows will show that without such assurance, the additional and immense development that has been achieved in the lower basin would have met the utmost opposition of the upper basin States. With the protection of the Colorado River compact of 1922, the upper basin States have been glad to see those developments occurring in the lower basin. Only under the protection of the Colorado River compact of 1922 could the present-day development of the lower basin have been attained. The water resource utilization program being currently sought by the upper basin States is dependent upon that same compact.

All then should be sweetness and light on the Colorado River and its tributaries. Alas, however, such is not wholly the case. There seem to be those who do not represent the majority feeling in any State but who are nevertheless highly vocal and influential, who are determined to prevent the realization of our legitimate aspirations to put to use our share of the waters of the Colorado River system. They enjoy and they propose to perpetuate the existing situation in which a large part of the waters to which the upper basin States are entitled races downstream to turn their turbines and multiply their wealth. In order to perpetuate this situation they have followed the consistent tactic of urging everywhere and whenever possible the adoption of water resource policies strictly designed to be beyond our ability to meet.

If this is not sufficient, they would, notwithstanding the lack of justification therefor, involve us in litigation to which they would then point as a barrier to our development. We urge the members of this committee, when they hear from those groups, as they undoubtedly will during the course of these hearings, to remember the fundamental purpose for which these groups do strive. Their objective is by all means to hinder and to prevent use by the upper basin States of any further substantial portion of the waters of the Colorado River system.

Senator KUCHEL. May I interrupt at that point to ask a question?

Senator MILLIKIN. Yes.

Senator KUCKEL. Could you document in any fashion for the record, Mr. Will, the accusations you make in this paragraph?

Mr. WILL. Yes, sir; I would be glad to.

Senator KUCHEL. I wonder if the record could include the specific charges which you make here with respect to the sentence which you just read, that their objective is to hinder and prevent the use by the upper basin States of any further substantial portions of the waters of the Colorado River and indicate who you have in mind.

Mr. WILL. Yes, sir; I will do both of those things.

Senator ANDERSON. It would be useful to do it now.

Mr. WILL. It might be, but it might take a little time.

Senator MILLIKIN. You might give him a little more time.

Senator ANDERSON. I am in favor of giving him all the time he needs.

Senator MILLIKIN. Will you do that, Mr. Will?

Mr. WILL. I will do so, Mr. Chairman.

(The information referred to was subsequently submitted, as follows:)

The objective of hindering and preventing the use by the upper basin States of any further substantial portion of the waters of the Colorado River has been an apparent objective of the Colorado River Board of California and of its constituent members: City and county of San Diego and San Diego County Water Authority, Palo Verde Irrigation District, Imperial Irrigation District, the Coachella District, Metropolitan Water District of Southern California, and the Department of Water and Power of the City of Los Angeles. Evidence of this objective is in part documentary and direct and, in part, circumstantial. In the former category are: the report for July 29, 1938, of the San Diego County Water Authority; and the statements of southern California witnesses before the Committee on the Public Lands, House of Representatives, 1st session, 81st Congress, in connection with H. R. 830, H. R. 1762, H. R. 1770, H. R. 1999, and H. R. 2000. In the latter category are statements made by southern California spokesmen before Presidential commissions and the recollection of individuals regarding transactions of the National Reclamation Association and the National Water Conservation Conference. The statements made by Messrs. Ely and Matthew, before the Senate and House Committees on Interior and Insular Affairs, in opposition to the authorization of the Frying Pan-Arkansas projects and the Colorado River storage project and participating projects are direct evidence of the objective mentioned above. At the National Water Conservation Conference in St. Louis, Mo., in February of 1953, Mr. Dowd, of the Imperial Irrigation District, urged the adoption of water policy recommendations that could, if they were adopted, successfully prevent development of the upper basin.

Mr. WILL. The evidence will show that although the Colorado River storage project and participating projects consists of two principal divisions and of a number of parts, it amounts to a single multiple-purpose Federal reclamation project that will make a beginning of the substantial development of the water resources of the upper Colorado River Basin States. Our project has two principal divisions, to wit: The storage division and the participating projects division. The storage division consists in those units, the principal purpose of which is to regulate the flow of the highly erratic Colorado River by storing water during years of plentiful flow for release during years of low flow.

Mr. Chairman, may I ask whether there have been distributed to the members of the committee copies of this blue book, entitled "Upper Colorado River Commission, Summary of Facts, Colorado River Storage Project and Participating Projects"?

I think you, Mr. Chairman, and the members of the committee will find that book useful. It contains in convenient form the necessary vital statistics regarding these several units.

As proposed in S. 1555 pending in Congress, the storage division would consist of the Echo Park, Flaming Gorge, Glen Canyon, Navaho, and Curecanti units. As proposed by the President of the United States and by the Department of the Interior, the storage division to be authorized at this time would include only the Echo Park and Glen Canyon units. As proposed by the Upper Colorado River Com-

mission's recommendations, the storage division would consist of the Echo Park, Flaming Gorge, Glen Canyon, Navaho, Cross Mountain, and Kendall units, together with general provision for storage on the upper reaches of the Colorado above Grand Junction.

Mr. Chairman, may I ask whether it would be appropriate to insert in the record at this time a copy of my letter to you of February 19, setting forth the amendments recommended by the Upper Colorado River Commission to S. 1555?

Senator MILLIKIN. That may be inserted in the record at this point. (The document referred to follows:)

FEBRUARY 19, 1954.

Hon. EUGENE D. MILLIKIN,
United States Senate, Washington, D. C.

MY DEAR SENATOR MILLIKIN: I have been directed by the commission to recommend the following amendments of the bill (S. 1555) to authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects, and for other purposes, now pending before the Senate Committee on Interior and Insular Affairs.

Page 1, line 7, after the word "States," insert "and with the Indian tribes."

Page 2, line 13, after the word "Navaho" insert "Cross Mountain."

Page 2, line 13, strike "Curecanti"; substitute "Kendall," together with the following proviso: "Provided, That no appropriation for or construction of the Kendall unit shall be made or begun until and unless the Secretary of the Interior shall have found it feasible under standards laid down by the Federal reclamation laws:".

Page 2, lines 13 to 19, delete "Provided, however, That the Curecanti Dam shall be constructed to a height which will impound not less than nine hundred and forty thousand acre-feet of water or will create a reservoir of such greater capacity as can be obtained by a high water line located at seven thousand five hundred and twenty feet above mean sea level;".

Page 2, line 22, after the colon insert "(a)".

Page 3, line 7, strike the word "coordinated." Substitute "feasibility."

Page 3, line 15, delete the period, insert a comma together with the following: "(b) and also one or more projects on the Colorado River and its tributaries above Grand Junction, Colo., which will impound approximately three million acre-feet of water, a substantial portion of which shall be located on the upper reaches of the Gunnison River: *Provided*, That no appropriation for or construction of any of such works shall be made or begun until a report thereon shall have been submitted to the affected states pursuant to the Act of December 22, 1944 (58 Stat. 887), and approved by the Congress."

Page 4, line 14, after the word "costs", insert: "within the capability of the land to repay."

Page 5, line 12, delete the beginning parenthesis and substitute a bracket.

Page 5, line 23, after the figures "1949," insert: "and in the case of Indian lands in participating projects, in excess of the amounts found to be within the capability of the land to repay."

Page 5, line 23, delete the ending parenthesis and substitute a bracket.

Page 6, lines 13 to 16, delete the entire clause beginning "Neither" and ending with the semicolon at the end of line 16, and substitute: "No right to impound or use water for the generation of power or energy, created or established by the building, operation or use of any of the powerplants authorized by this Act, shall be deemed to have priority over or otherwise operate to preclude or impair any use, regardless of the date of origin of such use, of the waters of the Colorado River and its tributaries for domestic or agricultural purposes within any of the States of the Upper Colorado River Basin:".

Page 7, line 13, after the word "power," insert: "generated in plants authorized by this Act and disposed of."

Page 7, line 18, strike the word "replaced"; substitute "supplied."

Page 11, line 12, strike "except on lands in Indian reservations."

Page 12, line 10, strike the period after the word "section" and substitute a colon, together with the following: "Provided, That this section shall not apply to lands in Indian reservations or lands owned by Indian tribes."

Insert the following section to be numbered 11 :

"**SEC. 11.** The Secretary is authorized and directed to do such things as may be necessary, including the granting of all necessary rights-of-way, easements, and dam sites on or involving public lands or power sites of the United States, to assist in the construction of the Blue River project, as hereinafter defined, and provided:

"(a) The Blue River project means that portion of the waterworks system and plant of the city and county of Denver, Colorado, which consists of works planned by the Board of Water Commissioners of the City and County of Denver, for a regulatory dam to be constructed at and near Dillon, Colorado, sometimes called the Dillon unit, a tunnel from Dillon, Colorado, to Grant, Colorado, sometimes called the Montezuma Tunnel, and regulatory storage, and hydro-electric power installations at and near the junction of the North and South Forks of the South Platte River in Colorado, sometimes called the Two Forks unit, and related improvements and structures, all for diverting at a point immediately below Dillon, Colorado, an average of not to exceed 177,000 acre-feet per year of water from the Blue River and its tributaries, transporting said water to the South Platte River near Grant, Colorado, and storing and utilizing said water for municipal uses including generation of electric energy.

"(b) Denver, as used herein, shall mean the city and county of Denver, Colorado, as its territorial limits are now fixed or may hereafter be extended.

"(c) Upon the condition that the legal availability of a reasonable quantity of water for the Denver-Blue River diversion be established, either by litigation or some other arrangement and the condition that such project be otherwise feasible, the Secretary, with the approval of Congress, shall advance to Denver, as a loan to be used in the construction of said project, funds of the United States in amounts not exceeding in the aggregate \$75,000,000 upon Denver entering into an agreement satisfactory to the Secretary to repay all money advanced, together with interest on unpaid balances, terms of repayment to include the following:

"1. Net revenues of the Denver water plant and taxes levied on all taxable property in Denver shall be made available to the discharge of Denver's obligations to be created under this section.

"2. No interest shall be payable on advances for the construction of any unit until completion of construction thereof, or until the lapse of fifteen years from the first advance therefor together with any period of delay on account of failure of the United States to provide money therefor, whichever shall occur first.

"3. Repayment of principal, with interest at the average rate being paid by the United States for long-term money at the time the repayment obligation arises, shall be made in fifty equal annual installments after the obligation to pay interest arises.

"4. Denver may accelerate the discharge of any portion of its remaining obligation to the United States at its election.

No money advanced under this section shall be used by Denver for overhead. The Secretary is authorized to make and execute agreements necessary or proper for the execution of the purposes hereof and the protection of the United States in the relationships to be created under this section."

"Sections 11, 12, 13, and 14 of the bills then would be numbered 12, 13, 14, and 15, respectively.

Page 13, line 9, strike the period after the word "Act"; substitute a colon, together with the following: "*Provided*, That appropriations for the storage units of the project and their incidental works may be made without regard to the soil survey and land classification requirements contained in other laws."

Page 14, line 12, insert: "The terms 'Secretary of the Interior,' and 'Secretary,' as used herein are synonymous."

For your ready reference, I enclose a copy of a map we have had made which shows the locations of the several units recommended for authorization. Copies of this may have been made available to Mr. Elmer Nelson for the use of members of the Senate Committee on Interior and Insular Affairs.

Sincerely yours,

JOHN GEOFFREY WILL,
Secretary and General Counsel.

Mr. WILL. Without the regulation to be provided by the storage division, the upper basin States cannot make any considerable additional uses of water of the Colorado River system that would not be

subject to ruinous interruption during years of low flows. Obviously, no great investment in such consumptive-use projects would be justified in the face of a threat of extensive and unpredictable interruptions in water supply. Finally, the benefits of silt retention, resulting in extension of the useful life of Lake Mead and in providing conditions under which the eventual construction of additional lower basin works will be practicable, must not be overlooked or minimized.

If there be any doubt regarding the need for the holdover storage recommended by the Upper Colorado River Commission, that doubt is easily resolved by facing a certain fact, to wit: that the periods of high flow of the Colorado River do not coincide with the periods of greatest demand on its waters. It is this fact which causes us to seek holdover storage.

The experts say that, in the light of historical measured flows of the river at Lee Ferry, the dividing point between the upper and lower basins, in the light of historical fluctuations from year to year and from period to period, we must equate the river by providing long-term cyclical, regulatory storage. They tell us that these holdover storage reservoirs will provide for the maximum and most efficient consumptive uses of water resources in both the upper and lower basins. As to the aggregate of the holdover storage required, they tell us that this can be ascertained by an examination of streamflow records coupled with understanding of the significance of annual and periodical streamflow characteristics.

The aggregate of the active storage that will be provided initially by the holdover storage reservoirs recommended by the Commission for authorization at this time is substantial. In the main, those who question the need for this storage do so on the basis of the limited consumptive-use projects proposed for authorization at this time. They seem, furthermore, to assume that all of the holdover storage recommended will be created at one fell swoop.

It should be borne in mind that not all of these holdover storage reservoirs will be created at once. These main-stem dams will be built over a long period of years. During this construction period, it is to be anticipated that many more consumptive-use projects will come into being, either through private or public investment or both. The storage to be provided must, therefore, be related to the limit of the consumptive uses that the upper Colorado River Basin is entitled to make under the Colorado River compact of 1922.

Thus, while it is perfectly true that not all of the holdover storage recommended for authorization at this time is needed immediately, yet it should be authorized now and constructed in orderly fashion so that, when it is needed, it will be available. It is obviously wise planning to construct the most efficient holdover storage units now, before additional inevitable consumptive uses occur in the upper basin in order to minimize the effects of the initial filling of the upstream reservoirs on the regimen of the river.

The proposal that this holdover storage be authorized at this point is comparable in soundness and foresight to the policies of the most conservative and successful corporations in our country today. Almost 30 billions of dollars were expended by American business in 1953, for new plant and equipment alone. Enormous public investments are likewise to be anticipated. An illustration of this is contained in the recent offering by the Metropolitan Water District of

Southern California of a new \$10 million bond issue, and the recent marketing of bonds by the Imperial Irrigation District. These new plants and facilities constantly being constructed by private and public enterprise are not immediately needed. They are an example of sound programs and investments in works that will be ready when they are needed. They are an example of confidence in continued growth. We have no lack of confidence in the future of the upper Colorado River Basin or in the future of the Colorado River Basin as a whole.

The testimony that will be presented to you during the course of these hearings will, in the main, show:

First, that many years of painstaking investigation have gone into the preparation of plans for the development, conservation and use of the water resources of the upper Colorado River Basin;

Second, the proposals resulting from those investigations constitute, as the President said, a "comprehensive, well-planned development of a river basin;"

Third, that the works proposed for authorization at this time are but a part of that plan;

Fourth, that the Federal Government and the States of the upper basin are in close agreement with respect to the type of program that is best adapted to the area. Differences of opinion are present, in the main, only with reference to the number and extent of the works that should be authorized for construction at this time.

It is our hope that the witnesses for the executive branch of the Federal Government may be heard first; and that they may be followed by the witnesses for each of the States represented on the upper Colorado River Commission in reverse alphabetical order.

Senator MILLIKIN. Thank you very much, Mr. Will.

Any questions?

Senator KUCHEL. Mr. Chairman, may I ask a question?

Senator MILLIKIN. Yes.

Senator KUCHEL. Mr. Will, referring to the Colorado River compact, article 111 of the compact provides that the States of the upper division shall not withhold water and the States of the lower division shall not require the delivery of water which cannot reasonably be applied to domestic and agricultural use.

Do I quote that part of the compact fairly accurately?

Mr. WILL. I am sure you do.

Senator KUCHEL. And it would be your desire that the legislation before us would not violate the Colorado compact, and particularly the section to which I have just alluded?

Mr. WILL. Nothing that we have proposed, in accordance with our judgment, is in violation of the 1922 compact, and we specifically have recommended the inclusion of provisions designed to obviate that.

Senator KUCHEL. Now with respect to the reservoirs and the problem of the storage of water and release of water, who under the bill before us now would have the responsibility of determining when and in what fashion water would be released from the storage reservoirs?

Mr. WILL. The Secretary of the Interior.

Senator KUCHEL. That is all, Mr. Chairman.

Senator ANDERSON. Mr. Chairman?

Senator MILLIKIN. Senator Anderson.

Senator ANDERSON. On page 5 of your statement, Mr. Will, you have in the second paragraph the declaration that it amounts to a single, multiple purpose, Federal reclamation project?

Mr. WILL. Yes, sir.

Senator ANDERSON. Don't you think it is extremely important that we bear that constantly in mind when we are discussing this bill on the development of the whole upper basin?

Mr. WILL. I do, Senator. I think that is extremely important. Some people have had the impression that this consists of a series of projects that might well be treated separately. Such is not the case. It is one project composed of a number of parts. But it is one project and it fits into the pattern of Federal reclamation projects heretofore authorized.

Senator ANDERSON. If that isn't done, don't we come up with all sorts of strange situations? For instance, Senator Johnson was discussing the Glen Canyon Dam. What does the Glen Canyon Dam do for irrigation in any of the States?

Mr. WILL. It makes irrigation possible in the upper basin States, Senator, by regulating the flow of the river so that we can meet our commitments downstream.

Senator ANDERSON. I know it does that, but will 1 drop of the water that is put in Glen Canyon Dam be used to irrigate 1 foot of land in any of the States of the Upper basin?

Mr. WILL. No, sir.

Senator ANDERSON. Therefore, realizing that it is a good project, we have to take a whole basinwide look at it and take in all the States, and decide that even though it doesn't provide irrigation when we are trying to get irrigation, if it does regulate stream flow, it may have value.

Mr. WILL. Yes, sir.

Senator ANDERSON. Senator Johnson points out that the project is going to cost some 526,000 acre-feet of evaporation, plus 100,000 acre-feet of sediment. That amounts to 600-and-some-thousand acre-feet a year or 10 percent of all the water that comes into the upper basin States that is going to be dissipated by the use of the Glen Canyon Dam.

There, again, we are asking the people of the upper basin to take a whole look at the entire project before we decide whether these units shall be built.

Mr. WILL. That is correct; yes, sir.

Senator ANDERSON. I know in the letter you sent to Senator Milikin, which I have not had an opportunity to review before, you recommend inserting the Kendall project, from Wyoming, which Senator Barrett mentioned, and which the governor mentioned.

Mr. WILL. Yes, sir.

Senator ANDERSON. Is that a new project?

Mr. WILL. It is a reservoir that will have very slight significance from the point of view of holdover storage, but some, and will be highly significant in connection with the Seedskaadee development in Wyoming.

Senator ANDERSON. The language you recommend says that no appropriation for construction of the Kendall unit shall be made or begun until and unless the Secretary of the Interior shall have found

it feasible under standards laid down by the Federal reclamation laws.

Mr. WILL. Yes, sir.

Senator ANDERSON. That is what is causing some trouble with some of the projects in this entire area, is it not?

Mr. WILL. Yes, sir.

Senator ANDERSON. We are trying to consider Kendall as an individual project. Are we trying to adopt a different rule on the Kendall project which we are unwilling to have with reference to other projects?

Mr. WILL. I don't think we are, Senator. I think on the Kendall project, our proposal for an amendment in that case, is in line with the proposals contained in S. 1555, regarding the conditional authorization of other units such, for instance, as the San Juan-Chama diversion in New Mexico, and certain developments in the south San Juan area, with respect to which final feasibility reports are not yet available.

Senator ANDERSON. That is why the language worries me a little bit. We have had a sample in the bill or recommendation being considered by the House committee where some projects in the State of New Mexico were removed from the bill because, when you applied the yardstick of feasibility to just those single projects, they might not have measured up, but by taking the entire basin as a simple multiple-purpose unit they had a place there.

I am just wondering if this recommendation with reference to Kendall might not be dangerous if we just took it singly.

Mr. WILL. We hope, Senator, that the New Mexico units and developments will fare better over here.

Senator ANDERSON. I do, too.

Mr. WILL. Note that the Kendall Reservoir wasn't approved by the House committee, either.

Senator ANDERSON. Which one?

Mr. WILL. The Kendall Reservoir in Wyoming.

Senator ANDERSON. I know it; and I am wondering why it might not be possible to consider the Kendall as a part of the single multiple-purpose unit, because surely we want Navaho Dam and the Navaho project and the other projects in our part of the area considered on that basis.

Mr. WILL. They should all be so considered.

Senator ANDERSON. Is there any reason why we are going to take these States up in reverse alphabetical order?

Mr. WILL. Yes, Senator. We thought that would best fit in with the convenience of this committee.

The States of Colorado and New Mexico have perhaps a more complicated problem to present than have the others. Accordingly, it was our judgment that this committee would prefer to hear first, after the Federal Government witnesses have testified, from the witnesses from Wyoming and Utah, where the internal problems are not as difficult.

Senator ANDERSON. On page 4 of your statement, in the middle paragraph, the very end of it, you express the hope that Congress will in general terms provide the framework within which there may be evolved definite plans, and so forth, for these projects.

I thank you and commend you for using the language you did. But when you use the term "evolve," by whom would those plans be evolved? Do you recognize the responsibility of the State to decide where its water should be used?

Mr. WILL. We think that it is a responsibility of the State, working in close cooperation with our commission and with the Federal Government.

Senator ANDERSON. But the quotation you have on the front page of your statement speaks of this fundamental policy that includes the interests and rights of the States in the development of the watersheds within their borders.

Mr. WILL. Yes, sir. We believe that the States now have, by law, in the language of section 1 of the 1944 Flood Control Act, certain duties and responsibilities and privileges in connection with the utilization and control of the waters within their borders.

Senator ANDERSON. You recognize, then, the responsibility of the State?

Mr. WILL. Yes, sir.

Senator ANDERSON. That is all, Mr. Chairman.

Senator MILLIKIN. Thank you very much, Mr. Will.

The next witness is Hon. Ralph Tudor, Under Secretary of the Interior.

Senator ANDERSON. Mr. Chairman, again I have had no opportunity to go over Mr. Tudor's statement in advance. I wonder if we might have an agreement that if necessary he will come back at some other time in case questions arise.

Senator MILLIKIN. Yes. I hope he will be available at any time.

I would like to say, Mr. Tudor, that I have to appear on the floor of the Senate in just a little while, so I will not be able to be here all the time. Senator Watkins will take over pretty soon.

Senator ANDERSON. Could we depart a moment to ask whether you plan to continue this afternoon?

Senator MILLIKIN. Yes.

Senator ANDERSON. Senator Kuchel and I are involved in the Santa Margarita water bill which, as the chairman knows, is a somewhat warm issue in the State of California. I think that would be considered a moderate statement. We would like to try to finish the conference and at the same time I would like to be here.

Senator MILLIKIN. We should go ahead with this, Senator, and if anything develops in your absence, it would be an easy matter to restore the witness so you can have your questions and get what information you wish. I don't think we should stop the hearing once we have started it.

Proceed, Mr. Tudor.

STATEMENT OF HON. RALPH A. TUDOR, UNDER SECRETARY OF THE INTERIOR, WASHINGTON, D. C.

Mr. TUDOR. Senator Millikin and gentlemen, I must confess I was not aware of a rule that the statement should be up here 24 hours in advance and perhaps that was my fault. I do not think, however, that there is anything in my statement that is new. It is more of an emphasis to things that have been here before, and I will be glad to return at any time the committee desires.

Senator ANDERSON. I think, Mr. Secretary, that the rule was adopted so that when it comes to a technical question, the people who are going to examine will have a chance to prepare that examination, just as you prepare the statement.

Senator MILLIKIN. I would suggest that all witnesses get their written material into the committee as rapidly as possible in advance of their appearing before the committee.

Senator WATKINS (presiding). Proceed, Mr. Tudor.

Mr. TUDOR. I have a prepared statement which I would like to read, and if there are any questions as I progress, please interrupt me.

I am appearing before your committee this morning to discuss the proposal and the legislation for the Colorado River storage project.

The project has a considerable history and a background of negotiating and planning that has covered many years. The development of irrigation enterprises using water from the Colorado River and its tributaries accelerated very rapidly between 1900 and 1920. This is particularly true in the lower portion of the basin in Arizona and California. The river has always been very erratic in flow and even in those early years it was evident that the time would come when all of the available water would have to be used with care and economy if even the ultimate essential needs were to be met.

In particular, it was evident that large storage facilities would have to be provided to equalize the erratic flows, conserve supplies, and make it possible to have an equitable division of the available water among the various States of the basin.

To this end the Colorado River compact was signed on November 24, 1922, and all 7 States were participants. This compact apportioned to the 5 upper basin States (Wyoming, Utah, Colorado, New Mexico, and Arizona) the right to exclusive beneficial consumptive use of 7,500,000 acre-feet of water annually. At this time the upper basin was obligated not to deplete the flow of the Colorado River at Lee Ferry below an aggregate of 75 million acre-feet in any consecutive 10-year period.

Senator ANDERSON. Right there, Mr. Secretary, those two statements don't completely tie together, do they?

Actually, what the upper basin States were guaranteed was that they could have whatever was left over after they delivered the seven-million-odd acre-feet?

Mr. TUDOR. I believe that is right.

Senator KUCHEL. Wasn't that the same theory on which the Mexican water treaty was adopted and ratified by the Senate, that we would deliver to Mexico a certain annual quantity of water each year, so that to that extent all the States of the Colorado Basin would have what was left?

Mr. TUDOR. I believe that is the case. I am not familiar with the details, but I believe it was agreed that you would deliver a million and a half acre-feet which had to be divided equally between the upper States and lower States, with one State, I believe, having a specific amount.

Senator ANDERSON. I would only say there that Senators McFarland of Arizona and Downey of California tried to stop or modify the compact with the Republic of Mexico, and I think if we had known what direction we were headed, we might not have approved it, because we are certainly in a position now where we would like to buy back that

million and a half acre-feet. I don't imagine Mexico would sell at any low price, but unfortunately we made the treaty.

Senator WATKINS. Which State tried to stop it?

Senator ANDERSON. Arizona delayed Senate committee action and some of our other Western States should have realized the possibilities at that time, Arizona sensing apparently what was to happen. It has been a frightening thing ever since, because here we are with this guaranty and no water to fulfill it.

Senator WATKINS. I happen to have been present at those hearings. The State of Utah officially supported it as did the upper basin States, with the possible exception of Wyoming. I represented a faction in Utah at the time which was opposed to it, and I think time has vindicated our opposition. I wanted to call that to your attention.

Senator ANDERSON. I congratulate my colleague for that stand. I am not worrying about the official position of the States. I just happen to know that Senator McFarland went as long as he could with his committee filibuster and it is too bad he didn't get more help.

Senator KUCHEL. May I inquire, also, where you say as you just read, this compact apportioned to the five upper Basin States the right to exclusive beneficial consumptive use of 7½ million acre-feet of water annually, do I understand by that that you mean that your interpretation there is that the compact provided that in each 12-month period that amount of water would be the maximum of beneficial consumptive use of the waters of the river to the five upper basin States?

Mr. TUDOR. Did you say the maximum?

Senator KUCHEL. There are two sentences. The first one is this compact apportioned to the five upper basin States the right to exclusive beneficial consumptive use of 7½ million acre-feet of water annually. That is to say that each year they would be entitled to that much?

Mr. TUDOR. Without benefit of having that before me, I think that is the minimum and not the maximum.

Senator ANDERSON. I believe that is correct. There is a provision for subsequent adjudication of the waters, which we now think do not exist. But certainly if there had been surplus, there would be an opportunity to adjudicate it. I did not mean to get into an interpretation of the compact, but nevertheless the fact remains that the upper basin States may end up with 40 or maybe 37½ percent of the water in a short time.

Senator KUCHEL. By way of comments to the suggestion of my friend from New Mexico, it is a fact, is it not, Mr. Secretary, that the Colorado compact must control the manner in which this legislation would be considered by the Congress?

Mr. TUDOR. That is correct, sir. That is our anticipation.

Senator KUCHEL. To that extent, where interpretations are required with respect to the provisions of the Colorado River compact, those interpretations, obviously, would have an effect upon the legislation which we are considering?

Mr. TUDOR. That is our intention. Our recommendations are that this legislation be within the confines of those two compacts.

Senator WATKINS. You may proceed.

I may make a suggestion to the members of the committee present that, if possible, let's mark the text where we want to ask questions and ask them at the conclusion of the witness' statement. Probably we will get a more consecutive understanding of what he is trying to say. Sometimes we fill the record up so full between the parts of the statement that it is almost impossible to get the clearcut interpretation.

Senator ANDERSON. I am afraid the Senator from California and I cannot wait to get into an argument. But go ahead, that is all right.

Senator WATKINS. Proceed, please.

Mr. TUDOR. By this compact the quantity of water available for consumptive use in the upper basin was specifically limited. In addition, any deficit in the water supply available for delivery to Mexico under the Mexican Treaty of 1944 must be furnished one-half by the upper basin and one-half by the lower basin.

As a result of this 1922 compact, it was possible to proceed with the development of the lower Colorado for the benefit of the lower basin States. In particular, the Boulder Canyon project proceeded immediately and other projects have followed.

In the meantime, the upper basin States had a problem of their own to divide among themselves the water that had been allocated for their joint use. To this end the upper Colorado River compact, specifying the percentages of the available water which each upper basin State might use, was negotiated and formalized. The Congress granted its consent to this compact and it became effective on April 6, 1949.

Thus the presently proposed upper Colorado River project is now presented to enable the upper Colorado River States to carry out their responsibilities to the lower basin States under the Colorado River compact of 1922 and distribute the remaining benefits among themselves in accordance with the upper Colorado River compact of 1949.

The Department of the Interior through the Bureau of Reclamation has been working in close cooperation with the upper basin States and various Federal agencies in the preparation of a coordinated plan of development of these water resources.

Adequate reservoir storage is the key to this plan and it is necessary to store water not only to take care of fluctuations in flow during any year, but also to take care of the very erratic flow of the Colorado River from year to year. This may vary from 4 million to 23 million acre-feet annually. The variation is unusually broad.

For this reason, the ultimate plan of development anticipates a series of 9 storage reservoirs having an initial total storage capacity of about 47,000,000 acre-feet. This amount of storage regulation is necessary to assure meeting the obligation of the upper basin to deliver 75 million acre-feet to the lower basin over a 10-year period and, at the same time, permit development of irrigation, municipal, and industrial use of water in the upper basin.

It is not my purpose to describe in detail features of the plan of development. Other witnesses who have participated in the detailed work and are more familiar with it than I am are available and will appear before your committee to cover these items. It is my pur-

pose, however, to bring out the general features and the basic policies which this plan as now presented and recommended by the Department of the Interior includes.

In the first place, I want to emphasize that this is a basinwide plan, and the various individual projects are designed to support each other and to provide the maximum economy of use of this water resource which is so vital to the area.

It is our recommendation that authorization be approved to provide for the initial construction of 2 reservoirs, Glen Canyon and Echo Park, and subsequent construction of 11 new participating projects. Echo Park and Glen Canyon Dams are the most effective and necessary units to river regulation. Furthermore, they generate power and will contribute substantially to the financial success of the entire development.

It is to be noted that these two projects will pay for themselves together with interest within 50 years even if no other features are built in the meantime.

It is our further recommendation that these 11 new participating projects, including both storage and reclamation developments, be authorized at this time subject to reexamination of the economic justification of each project and further report by the Secretary to the President and the Congress when it is later proposed to proceed with each such project. These further reports shall include certifications that the benefits of each project exceed its cost.

It is also recommended that these further reports include a joint study with the Department of Agriculture of the direct agriculture benefits of each of these projects. It is our intention that this reappraisal of the economic justification of each project will be based upon national water, economic, and other appropriate policies in effect at the time the first appropriations for such project are sought.

The economics of the upper Colorado River project anticipate that all investments for the production and transmission of power and for providing municipal and industrial water will pay for themselves in full, including interest, within a period of not to exceed 50 years, and that both the interest and the principal will be returned to the Treasury. Additional net earnings from these activities are expected to be used to assist the irrigators in paying for the capital investment in irrigation developments.

In the case of irrigation, the plan contemplates that full repayment of the principal will be returned to the Treasury within a combined period of 10 years, allowed for initial development, and an additional pay-out period of 50 years. It is not anticipated that interest on the investment in irrigation will be repaid, since this has been the continuous national policy from the enactment of the original Reclamation Act of 1902. This policy relative to the interest has been applied to all other reclamation projects heretofore built by the Federal Government.

It is our proposal that in those instances where repayment of interest-bearing costs, such as power, and noninterest-bearing costs, such as reclamation, are due concurrently, they will be repaid concurrently to the extent practicable. In other words, it is not the intention to defer payments on noninterest-bearing items until the interest-bearing items have been paid out.

This total project is made up of a number of individual units. The initiation of construction of these individual units is to be scheduled over the years so that each one may be paid for within the time limits described above.

We propose that in order to assure better repayment of irrigation costs of these projects conservancy type districts be established in each instance. This will give a broader base for repayment.

We also recommend that provision be made for financing the entire undertaking through a separate revolving fund to be established in the Treasury of the United States. This fund would—

(a) Receive all appropriations for construction, operation and maintenance as advances from the general fund of the Treasury;

(b) Receive all revenues collected in connection with the operation of the project;

(c) Be available for the operation and maintenance of the project subject to such limitations as may be imposed by the Congress in annual appropriations acts;

(d) Be available for construction in accordance with the appropriations made therefor;

(e) Pay to the general fund of the Treasury, annually, after completion of any feature or unit, a sum sufficient to return within 50 years, exclusive of authorized development periods, the full reimbursable costs of that unit or feature, including interest on power and municipal water supply investment; and

(f) Provide Congress with a business-type budget for the project annually.

It is anticipated that the above recommendation will provide a sound and understandable continuous accounting of the funds invested in and received from this upper Colorado River project.

In making this presentation to the committee, it is my desire to give special consideration to one feature of the project because of certain unusual circumstances surrounding it and certain personal investigations and recommendations that I have made in this instance. I refer to the Echo Park Dam and reservoir. Inasmuch as this dam and reservoir fall within the confines of the Dinosaur National Monument, there has been opposition to its inclusion. In view of this opposition, the former Secretary of the Interior agreed to study and consider proposals for alternate reservoirs that would be outside the limits of the monument. In keeping with this commitment, Secretary McKay directed that such a study be made and in particular directed me to give it my personal attention.

In accordance with these instructions, I reviewed the reports which have been made by the Bureau of Reclamation and the studies, comments and other information which was made available to me by the National Park Service. I also met with a number of people and organizations who were interested and had expressed opinions both for and against this development. I was furnished with considerable literature and read most of it.

Finally, I made a personal reconnaissance of much of the upper Colorado River Basin area. In particular, and in company with the Commissioner of Reclamation, I went by auto and boat to the vicinity of the Glen Canyon Dam site. I flew over much of the Colorado River and its tributaries from the southern boundaries of Colorado to Vernal via Grand Junction and Salt Lake City.

These rivers are in a region noted for its scenery. I viewed a number of the proposed alternate dam sites, including New Moab, Desolation, and Dewey. Finally, in company with the Director of the National Park Service and the Commissioner of Reclamation together with members of their staffs, I spent 3 days in the Dinosaur National Monument. This included a boat trip through Whirlpool Canyon of Green River from the mouth of Yampa River to Island Park.

I also visited most other major points of interest by jeep and viewed by air the entire length of Lodore Canyon.

As a result of these studies and this field trip, I recommended to the Secretary that the Echo Park Dam and Reservoir be included in the upper Colorado River Basin project. My recommendation to him was in a brief memorandum, dated November 27, 1953, and approved by Secretary Douglas McKay November 30, 1953, which reads as follows:

In accordance with your verbal instructions I have made a study concerning the proposal to build the Echo Park Dam and the Split Mountain Dam as a part of the upper Colorado River Basin development. These two dams, if built, will be located within the Dinosaur National Monument. They were originally proposed to be included in the plan of development of the basin which was prepared by the Bureau of Reclamation and recommended for approval by the Secretary of the Interior in January 1951. Opposition developed to the construction of these two dams in the Dinosaur National Monument, and on December 4, 1952, the then Secretary of the Interior revised his recommendation and proposed that further consideration be given to studies of alternate sites. It was under these circumstances that you directed me to investigate the matter with particular reference to the suggested alternate sites.

In connection with this investigation I have reviewed the reports, sought and been furnished data, and information from both the National Park Service and the Bureau of Reclamation, conferred with various interested parties and organizations, and have, in company with the Director of the National Park Service and the Commissioner of the Bureau of Reclamation, personally visited the two dam sites in question and inspected a considerable portion of the Dinosaur National Monument. I also inspected on the ground and from the air other portions of the upper Colorado River area.

The opposition to the two dams in question arises from persons and organizations interested in the national parks and their desire to preserve the Dinosaur National Monument in its present natural state. The Echo Park Dam, in particular, will create a large reservoir within this monument and will alter its appearance and the existing conditions. It is a matter of personal opinion as to the extent of the harm that may be created by this reservoir. My own feeling is that the alteration will be substantial and if conflicting interests did not exist, I would prefer to see the monument remain in its natural state. However, I do feel that if the dam is built, the beauty of the park will by no means be destroyed, and it will remain an area of great attraction to many people.

It should be noted that neither of these proposed reservoirs will inundate any portion of the quarry where the dinosaur skeletons have been found.

I have examined the proposals for various alternate reservoirs. To be effective these alternates must provide approximately the same storage of water and must waste as little water as possible. The latter is extremely important for the available water for consumptive uses in the upper Colorado River Basin is far less than will be needed for the full economy of this region.

I have been furnished with information on the New Moab, Dewey, Desolation Dam sites, and have considered the possibility of increasing the height of the proposed Glen Canyon Dam. I am particularly impressed with the showing that any of these alternate dam and reservoir sites would result in a net loss of water from evaporation from approximately 100,000 to 200,000 acre-feet per year. Even the lower figure is enough to provide all of the domestic, commercial, and industrial water for a city the size of Denver. In an area where water is so precious this is a matter of very serious consequence. Such lost water cannot be replaced at any cost and the ultimate regional economy would have to be reduced accordingly.

There has been some question as to the accuracy of the estimates of evaporation and the application of the formulas used to compute losses. I have reviewed this matter and, while there may be some error due to a shortage of experimental data, I am convinced that the calculations are reasonable and any error that exists is equally applicable to the calculations for all reservoirs. Therefore, the error in net differences in calculated losses between any two reservoirs must be small.

There would be substantial loss in electric generating capacity if any one of the alternate sites were selected. While this is a matter of economic importance, I do not attach as much weight to it as the loss of water. The power loss could be replaced by steam power at some increased cost.

I share the concern of those who would preserve the beauties of the Dinosaur National Monument in their present natural state, but as between a choice of altering this scenery without destroying it in a basin which is and will remain rich in scenery, or the irreplaceable loss of enough water to supply all the needs of a city the size of Denver, I believe the conservation of the water in the interest of the Nation is of greatest importance.

In view of the foregoing, I recommend that the plan for the development of the upper Colorado River Basin include the Echo Park and Split Mountain Dams and Reservoirs within the Dinosaur National Monument. This is in keeping with the original recommendation made by the former Secretary of the Interior.

Except to the extent that an error was made by the Bureau of Reclamation in a calculation of evaporation losses of the high Glen Canyon Dam and Reservoir, this statement stands. In the case of a high Glen Canyon Reservoir, the increased evaporation compared to that of Echo Park and Split Mountain Reservoirs would be approximately 25,000 acre-feet annually.

However, as pointed out in testimony before the House committee, a high Glen Canyon Dam is not an acceptable alternate. The storage it provides is at the extreme lower end of the upper basin and would, therefore, be very substantially less effective than upstream storage. This would impair needed regulation of the upper section of the river system and have important adverse effects on the operation and economic value of the total development.

In making this recommendation on behalf of the Echo Park Dam and Reservoir, the Department is, of course, on the horns of a dilemma. On the one hand, there is a fundamental desire to preserve the natural beauty of the Dinosaur National Monument. The Department does not subscribe to any policy which contemplates indiscriminate or haphazard construction of reservoirs or other artificial developments in this or any other national park or monument area.

It opposes any development in such areas if this can possibly be avoided without undue and irredeemable losses of some other natural resources. On the other hand, the Department does recognize that in this instance any otherwise acceptable alternate would result in a serious loss of water in a region which will always be short of this commodity and in which water is the limiting factor on the development of the economy and resources of the basin.

Again I point out that the choice is simply one of altering the scenery of the Dinosaur National Monument without destroying it in a basin which is and will remain rich in scenery, or of irreplaceably losing enough water to supply all the needs of a city of more than 600,000 people. In the opinion of the Department of the Interior, in this particular instance, and not as a matter of precedent, we believe that the choice should be in favor of building the dam and reservoir, and that this is to the greatest interest of the Nation. We so recommend to the Congress.

Senator WATKINS. At this point the committee will take a recess. I think the members of the committee would like to be on the floor when the new Senator is sworn in, and the Secretary has immediate appointments downtown.

I would like to inquire of the Senators present if they would like to question Secretary Tudor.

Senator ANDERSON. Yes.

Senator WATKINS. Then we will ask the Secretary to come back at 2 o'clock.

Senator ANDERSON. Senator Kuchel and I would be very appreciative if you would give us an hour to be on the floor and reconvene at 3 o'clock. I am doing this not at the convenience of myself, I assure you, but the Senator from California has too been interested in this, and I would like to stay through the conference if at all possible.

Senator KUCHEL. I urge you, Mr. Chairman, to consider that request.

Senator WATKINS. May I say this: I am not entirely a free agent in this matter. I am acting at the instance of the Chairman of the Subcommittee, and he asked that I recess until 2 o'clock.

Senator KUCHEL. Would you consider recessing until 3 o'clock, Mr. Chairman, so that that extra hour would be available to us? That would be all the time we would spend in our conference committee.

It does represent a 2 weeks' continuance, to 2 o'clock this afternoon, and it would be of great benefit to the junior Senator from California, and certainly the junior Senator from New Mexico is interested in the problem.

If we just had that hour's time, I am sure we could make substantial progress and come back here.

Senator ANDERSON. I will put it this way, Mr. Chairman. If we do come back at 2 o'clock, others can go ahead and question Mr. Tudor as much as desired, but I am going to be back at 3 o'clock and question him all over again. I just hope we can delay it.

Senator WATKINS. You heard the explanation the presently acting chairman made. I don't want to be unreasonable about it. I will go as far as I can. Can you make it at 2:30?

Senator ANDERSON. As far as I personally am concerned, the Senator from California knows I have been opposed to earlier versions of his bill for a long time. It might suit me individually to let the bill die. Unfortunately I am in this group now trying to help individuals get a solution to a problem that has been bothering the people in California a long time. And I would like to see it through.

Senator WATKINS. I will assume the responsibility for recessing until 3 o'clock.

Senator ANDERSON. Thank you.

Senator WATKINS. That means we will probably continue later tonight.

Senator ANDERSON. That is all right.

(Whereupon, at 12:15 p. m. the committee was recessed, to reconvene at 3 p. m. the same day.)

AFTERNOON SESSION

Senator WATKINS. The committee will be in session.

The chairman is advised that the two Senators who wish to examine Mr. Tudor will not be here for a few minutes. They are still in conference on the Santa Margarita bill.

We will call a witness out of order. Hon. L. C. Bishop, Colorado River Commissioner for Wyoming, will be our next witness.

STATEMENT OF L. C. BISHOP, WYOMING STATE ENGINEER

Senator WATKINS. Mr. Bishop, we are very glad to have you with us. You may proceed.

Mr. BISHOP. Mr. Chairman, members of the committee, my name is L. C. Bishop. I am State engineer of the State of Wyoming, and I offer the following statement with reference to the bill that is now before the Senate, for authorization of the upper Colorado River storage project and participating projects. The bill under consideration by this committee proposes the authorization for construction of 5 initial units of the so-called Colorado River storage project, and 16 participating projects. Three of the participating projects are located in Wyoming. None of the proposed storage units are in Wyoming.

The proposed storage units are important, not only to the upper Colorado River Basin but to the State of Wyoming. These storage units are essential to making possible the use of the water by the upper Colorado River Basin States which was allocated to them under the 1922 Colorado River compact. They are essential to meeting the minimum flow obligations at Lee Ferry imposed by the 1922 compact.

The most important of the five proposed storage units to the upper Colorado River Basin and to Wyoming are the Glen Canyon and Echo Park Reservoirs. These two units are essential elements of the team of reservoirs required to permit the use and to meet the obligations resulting from the 1922 Colorado River compact. The power revenue from these two units are necessary in connection with the irrigation development in the upper basin States, since irrigation development cannot be accomplished without a subsidy from power revenues. These two units are essential from the standpoints of (1) maximum water utilization, (2) minimum evaporation loss and (3) most economical power production.

I discussed the Echo Park Reservoir situation at some length at the House hearings on the Colorado River storage and participating projects and I refer you to pages 273-280 of the House committee hearings on this matter.

The three participating projects in Wyoming proposed for construction under this bill are the LaBarge, Lyman and Seedskaadee projects. These projects will irrigate 68,000 acres of new land and provide supplemental supply to about 40,000 acres which are already under irrigation. The total water depletion resulting from these 3 projects will be using only about 35 percent of the water allocated to it under the 1948 upper Colorado River Basin compact.

The completion of the units of the Colorado River storage project and the participating projects proposed under this bill will result in a

total water use in the upper basin which is still well under the use allocated to the upper basin under the 1922 Colorado River compact.

We are convinced that the authorization of the units of the Colorado River storage project and participating projects proposed under this bill is the necessary first step in making possible the full utilization of water resources of the upper Colorado River Basin States. It is essential in the development of the many and unlimited mineral resources of the upper basin. It is a very important step in the enhancement and utilization of the recreational resources of the basin.

Thank you.

Senator WATKINS. Mr. Bishop, in addition to the participating projects which you have just mentioned, there is one which has already been authorized. That is the Eden project. That was authorized on the theory that some help would be forthcoming for it out of this basin fund or this pool of money that will be collected in the Treasury for the benefit of the overall project. Congress, in a way, has already given some sort of approval of that type of financing in the bill authorizing the Eden project.

Mr. BISHOP. That is right.

Senator WATKINS. I am calling it to your attention because I was on the committee when that was considered. In fact, I think I was responsible for the amendment which put it in that group. Otherwise, it might not have qualified as a feasible project, because the costs were rather high.

Are your other Wyoming witnesses here, Mr. Bishop?

Mr. BISHOP. There are none at present.

Mr. NELSON. Will they be here?

Mr. BISHOP. Tomorrow two additional witnesses plan to be here.

Senator WATKINS. Thank you very much, Mr. Bishop.

The committee will recall Mr. Tudor.

STATEMENT OF HON. RALPH A. TUDOR, UNDER SECRETARY OF THE INTERIOR, WASHINGTON, D. C.—Resumed

Senator WATKINS. Senator Anderson, you may continue your examination.

Senator ANDERSON. Mr. Secretary, the last words in your testimony this morning were "we so recommend to the Congress."

That had to do with the Echo Park site. What we have under consideration is Senate 1555. How do you recommend to the Congress on that?

Mr. TUDOR. I am not familiar with the details of S. 1555.

Senator ANDERSON. That is the Senate bill introduced by Senator Millikin, for himself, the junior Senator from New Mexico, Mr. Barrett, Mr. Chavez, Mr. Goldwater, and others.

Mr. TUDOR. We recommend the passage of that bill with amendments which we have furnished your committee, sir.

Senator ANDERSON. Is that in the records of the committee?

Mr. TUDOR. Yes, sir. We sent that to the Senate, I think in March, March 31.

Senator ANDERSON. If it has been put into the record this morning, we only got one carbon copy of it. Could you tell us anything about the recommendation?

Mr. TUDOR. I summarized it, sir, this morning in my statement.

Senator ANDERSON. Starting at the bottom of page 3?

Mr. TUDOR. Yes, sir.

Senator ANDERSON. That recommends the initial construction of two reservoirs.

Mr. TUDOR. That is correct, sir.

Senator ANDERSON. Glen Canyon and Echo Park. The Senate bill contains a recommendation for Curecanti?

Mr. TUDOR. We recommended tentative authorization of the central Utah, Emory County, Florida, Hammond, La Barge, Lyman, Paonia, Pine River extension, Seedskadee, Silt and Shiprock.

We did not recommend others, although our recommendation in the bill is that that is without prejudice.

Senator ANDERSON. Then I understand not only is Curecanti left out, but Navaho Dam is also left out.

Mr. TUDOR. That is correct, sir.

Senator ANDERSON. And you mentioned in your report here that you recommend also some participating projects. I don't see the Navaho on that one, either.

Mr. TUDOR. No, sir; the Navaho is not among the list that we recommend for initial inclusion in this bill, but we do make provision in the bill for the addition of other participating projects as they may be studied and reported upon.

Senator ANDERSON. Mr. Secretary, knowing what a time we are going to have on this bill, with the opposition that is already coming up when all of the upper basin States are together, what chance do you think Navaho project would have by itself with only New Mexico pushing it?

Mr. TUDOR. The Navaho project was referred to in the letter from the Bureau of the Budget to the Secretary, which was made a part of the record, and sent forward to the Senate.

Provisional authorization of the Shiprock unit of the Navaho project would not be in accord with the program of the President at this time. This advice is without prejudice to further consideration of the project when a report is completed indicating its economic justification, the views of the affected States and agencies, and the relation of the project to other potential users of water of the San Juan River.

Senator ANDERSON. That is the point. The cost of that project is about \$178 million, and the plan of the Bureau of Reclamation was that about \$13,500,000 of that would be charged against irrigation. The other \$165 million would come back eventually from the power revenues of the breadwinners, the Grand Canyon Dam and Echo Park Dam.

By leaving it out of this project as a participating project, you promise to give it consideration at a later date, when the whole \$178 million would be placed against 115,000 acres of land. Would you have a little trouble justifying it at a later date?

Mr. TUDOR. I think you would on that basis, Senator.

Senator ANDERSON. Was that the purpose of leaving it out?

Mr. TUDOR. No, sir.

Senator ANDERSON. What was the purpose for leaving it out?

Mr. TUDOR. The reason for leaving it out was because we do not now have adequate information or an adequate report on it.

Senator ANDERSON. Would you say you had better information on the central Utah project than you would have on the Shiprock project on which engineers have been working for years?

Mr. TUDOR. We had a better understanding between the people who were concerned with that, and I think better information. But I would like to have that answered specifically by the engineers who have been working on it. I have not, sir.

Senator ANDERSON. You included the Gooseberry project. Do you have better understanding on the Gooseberry project than you have on the Navaho project?

Mr. TUDOR. That, again, I would like to refer to the engineers working on it, because I am not familiar with the details.

Senator ANDERSON. Are you familiar with the Florida project?

Mr. TUDOR. No, sir.

Senator ANDERSON. Or the Seedska-dee project?

Mr. TUDOR. No, sir.

Senator ANDERSON. Has it been purely a question of the engineers on the Navaho project? Are they the only ones that have some question about it?

Mr. TUDOR. No, I think there is some question in that particular case in the Department and also in the Bureau of the Budget relative to an understanding between the various interested parties, the Indians, and the States involved, sir. But may I point out, sir, that it is not the intention to make that stand on itself. It will have to, and we do contemplate that when and if that is approved and authorized that it be a part of the upper Colorado River project and like the others would share in the revenues from the power projects which are financing it.

Senator ANDERSON. But you say "when and if approved." Of course if we don't get it approved in this original list, you and I probably will not live long enough to see it approved and I doubt if I know anybody that will live long enough to see it approved. Once this upper basin program is approved, the amount of revenue that is going to be available from Glen Canyon and Echo Park is going to be required for a great many projects. Senator Johnson gave a list of the things he would like to have in the State of Colorado. If you leave out the Navaho project and make no mention of that at this time, does anybody in your Department feel there is any hope of having it approved in this generation?

Mr. TUDOR. We have not measured it that way. We have felt that when we do have the studies in better order and a full understanding between the parties, that it could very well be taken up for authorization in the near future.

Senator ANDERSON. Well, you say that you do recommend 11 participating projects. Does that imply sort of a conditional authorization for all 11 recommended projects?

Mr. TUDOR. Yes, sir. The recommendation which we have made as to this legislation does contemplate a conditional recommendation on all of those, and my statement this morning brought that ought. That is, as we come up to each one at a subsequent time, the Secretary would make a certification to the President and to the Congress that that project meets with the proper economic justification.

Senator ANDERSON. I have not seen the LaPlata project in quite a while, but as I remember the study on it, the LaPlata project didn't

have the greatest margin of economic justification, did it? I am trying to say to you that if you approve all of these other projects, running into the hundreds of millions of dollars, naturally every area and every State that had a project approved on this list would find it to its advantage not to hurry the Navaho project through, because it would want to get its own project paid for and fully developed.

I am wondering, if this involves conditional approval of all these projects, what would happen to the remaining New Mexico projects.

Mr. TUDOR. The Congress could bring that up when we have more information.

Senator ANDERSON. It could bring it up, but have you ever seen what happens when one lone State brings it up by itself?

Mr. TUDOR. Perhaps my experience has not been long enough, sir. I don't know.

Senator ANDERSON. Well, it wouldn't be too pleasing sometimes. Let me ask again, does the Department oppose the inclusion of Curecanti as an initial reservoir as included in the House committee's recommendation?

Mr. TUDOR. No, I don't think we oppose it. We are not endorsing it at this time.

Senator ANDERSON. Well, if you do not endorse it, and say "pass the bill without it," is that not almost opposition to it? It certainly is not enthusiastic support, is it?

Mr. TUDOR. No, that is correct; it is not enthusiastic support.

Senator ANDERSON. Does the Department oppose the inclusion of the Navaho Dam?

Mr. TUDOR. Let me put it this way: We do not believe that we have adequate information on it at this time to justify our enthusiastic support of it.

Senator ANDERSON. Do you know how long the Bureau of Indian Irrigation has been working on the Navaho Reservoir?

Mr. TUDOR. I don't know. But I understand it has been quite a while, sir.

Senator ANDERSON. It has been many, many years.

Am I correct in assuming—I don't know whether or not you are sufficiently familiar to answer—but am I correct in assuming that the only real question on the Navaho Dam is the height to which it might be built?

Mr. TUDOR. I am not familiar with what the question is; no, sir.

Senator ANDERSON. The report on the Colorado River some time ago gave the height of the Navaho Dam, as I recall, at about 335 feet above the bed of the stream, above the rock, and then I believe there is about 20 or 30 feet of bedrock. At least the information was sufficient so that years and years ago I could read how many feet it took to get down to the base. Is that not the basis, at least, of the study of a dam?

Mr. TUDOR. That would be from an engineering viewpoint, as to whether you could build it.

Senator ANDERSON. They figured it out so they could reduce the price. They used to list the cost as \$75 million, and at a later time they list it as \$57 million. If they can figure it to the dollar, they must know something about it, do they not?

Mr. TUDOR. I think the ability to build a dam is not the point, sir, but I think it is the whole economic justification for the whole project.

Senator ANDERSON. Then they could go ahead and construct the Navaho Reservoir? They have enough information for that?

Mr. TUDOR. I would prefer to have the engineers answer it in detail, because I am not that familiar with it, sir. We could get the answer for you.

Senator ANDERSON. In this testimony of yours, at page 4, at the top of the page you say:

It is our further recommendation that these 11 new participating projects, including both storage and reclamation developments, be authorized at this time subject to reexamination of the economic justification of each project and further report by the Secretary to the President and the Congress when it is later proposed to proceed with each such project.

Would you translate that for me a little bit and tell me if that is really a conditional authorization?

Mr. TUDOR. That is a conditional authorization, subject to this certification by the Secretary at a later date when it is proposed to seek the funds for its construction, sir.

Senator ANDERSON. So that when the State of New Mexico comes in and asks for conditional approval of three projects in that State, that action is not different from what the Department itself is recommending in the case of these 11 projects?

Mr. TUDOR. It would presumably be subject, and I would so recommend if they are included, they should be subject to the same conditions.

Senator ANDERSON. We do, too. As a matter of fact, S. 1555 if you would read its language, says that these projects for New Mexico be included, the San Juan-Chama project, the Shiprock, South San Juan irrigation project. They are different in our opinion from the Navaho Dam in the Navaho division, but it says that no work on them shall be made or begun until coordinated reports thereon shall have been submitted to the affected States, pursuant to the act of December 22, 1944, and approved by the Congress. You would recognize that as merely a conditional authorization, would you not?

Mr. TUDOR. That is correct, sir.

Senator ANDERSON. So that what the Department itself has recommended for these 11 new participating projects is not greatly different from what the State of New Mexico thinks ought to be done with its projects?

Mr. TUDOR. That is right.

Senator ANDERSON. I have asked you about the Navaho Dam, as to whether you had any objections to it. Merely to keep the record straight, I want to ask you if you have any objection to the South San Juan project, tied into the Shiprock project, or the San Juan-Chama diversion project, as such.

Mr. TUDOR. I know of no objection myself, sir, but I am not familiar with the details of that project, so I would prefer to have Mr. Larson answer that.

Senator ANDERSON. Of these projects that are listed, which you did approve, the first one is the Glen Canyon Dam. I believe Senator Johnson in his testimony said that it would prolong the life of the Hoover Dam for 500 years. That would be of great benefit to the States of the lower division, would it not?

Mr. TUDOR. Certainly it would be. I am not familiar with the figure. That is the first time I ever heard a figure as large as that.

I am sure it would retain some of the silt that would otherwise go into the Hoover Dam.

Senator ANDERSON. I read the House report and it listed something on that.

At page 211 of the House hearings, Mr. Dexheimer gave a figure and he said that the Glen Canyon Dam would hold back two-thirds of the silt that would otherwise go into the Hoover Dam. If it holds back two-thirds of it, and the life of the dam now is something over a hundred years, that would give some basis, perhaps, for Senator Johnson's calculation. At least it would be for a reasonable period of time, would it not?

Mr. TUDOR. I feel confident there would be some benefits.

Senator ANDERSON. What would be the benefits to the upper division by the retaining of that silt? Would there be any?

Mr. TUDOR. No, I don't know of any benefits that would be derived to the upper basin States from that.

Senator ANDERSON. Neither do I. But the water that goes into Glen Canyon is a part of the water that is allocated to the upper basin States, is it not? I mean that of the water that flows into it, 50 percent belongs to the State of Colorado, and 11 percent to the State of New Mexico and so forth, so that these States have an interest in the water that is flowing into the Glen Canyon Reservoir, do they not?

Mr. TUDOR. At the time it gets into that reservoir, it is past the point where they can use it, except for the generation of power.

Senator ANDERSON. Precisely. But they have some interests, do they not, in the water flowing into that area?

Mr. TUDOR. In order to use the water themselves they must provide that storage in order to regulate the downstream flow.

Senator ANDERSON. Are you suggesting to the Navahos, for example, that they should start using the water up in the Navaho Reservation, and not let it get into the Glen Canyon Dam?

Mr. TUDOR. No, sir.

Senator ANDERSON. Then do they not have some economic interest in the water that goes into that dam?

Mr. TUDOR. They have some economic interest in that dam; yes, sir.

Senator ANDERSON. And the proceeds of that dam, the profits that might accrue from the sale of power of that dam might properly be used to develop projects in the State of New Mexico, just as they would in the other States, would they not?

Mr. TUDOR. That is correct, sir.

Senator ANDERSON. Therefore, do you think it is completely fair to build all of the projects in these wonderful States like Utah, Colorado, and Wyoming, and leave New Mexico out of it entirely?

Mr. TUDOR. No. I quite agree that the benefits from Glen Canyon can properly be distributed to the States upstream which contribute the water to that.

Senator ANDERSON. New Mexico gets nothing out of the recommendation that you have made.

Mr. TUDOR. There is no project included in the recommendation here at the present time; no, sir; and unless a project were recommended now or later, they could not benefit from it.

Senator ANDERSON. Now I turn to your testimony again on page 4, where you speak of the economic reexamination, which I refer to as a

conditional authorization, the reexamination of the economic justification of each project.

Do I understand by that that you are going back over these 11 projects and check the economic justification of each one of them?

Mr. TUDOR. Yes, sir.

Senator ANDERSON. Will they all have to stand on their own feet?

Mr. TUDOR. No, sir. I thought that was the point. We do not anticipate that each one will stand on its feet. In fact, it couldn't.

Senator ANDERSON. The one in Utah wouldn't be able to stand on its own feet, would it?

Mr. TUDOR. No, sir. They would have to have financial benefits particularly from Glen Canyon power generation to support them economically.

Senator ANDERSON. You understand, I do not object to that, I endorse that principle very heartily, and I hope the central Utah project is built. I realize that if it doesn't stand on its own feet, power revenues ought to go and be used for it. By the same token, we would like to see some of those power revenues utilized in water projects in the State of New Mexico. We are afraid from the language that we see here that you might take these other projects and approve them and then take a look at the Navaho project, the Shiprock project, the south San Juan and the San Juan Chima projects and say "I can't find an economic justification for that lone project."

Do I understand that when you do examine these projects you will look at them the same way that you looked at the central Utah project?

Mr. TUDOR. That is correct, sir.

Senator ANDERSON. As a part of the whole?

Mr. TUDOR. Yes, sir.

Senator ANDERSON. Then it says:

These further reports shall include certifications that the benefits of each project exceed its cost.

That sounds to me like you did mean each project. That is your own language of this morning.

Mr. TUDOR. No. It could be interpreted that way, I could see that.

Senator ANDERSON. I know it could. That is what frightens me. Don't you mean it to be interpreted that way? Is the language clear?

Mr. TUDOR. The language may not be clear.

Senator ANDERSON. It sounds clear. It says:

These further reports shall include certification that the benefits of each project exceeds its cost.

Mr. TUDOR. If the language is not clear, and I can see where it might not be, our intent is that these projects, as may be necessary, would be benefited by the power revenues from the Glen Canyon, for example, and the others that do generate power and sell it.

Senator ANDERSON. So that if the Navaho project, including the reservoir and the Shiprock division, were brought forward at a subsequent date, they would not have to have economic justification and pay for themselves, but you could apply to them the power revenues from the Glen Canyon Dam and from the other dams and make them feasible?

Mr. TUDOR. That is correct, sir. The intent is that any of these projects that would be authorized would receive the same benefits, so long as they were within the upper Colorado River Basin.

Senator WATKINS. May I break in a minute?

Senator ANDERSON. Yes, indeed.

Senator WATKINS. The statements you have just made recall some diagrams or charts that I have seen, which set out the ratio of benefits to cost. In all of these projects, I think, except one, the ratio was very favorable. That is, the benefits exceeded the costs. Was that just a straight-out apprizement of those projects on their own?

Mr. TUDOR. I can't answer that one, Senator. I think Mr. Larson can. But bear in mind when we talk about benefits here, the term "benefit" does not mean simply the revenues from the project. It is the benefits both direct and indirect.

Senator ANDERSON. I remember those charts.

Mr. TUDOR. There are very few if any of these projects that will pay for themselves out of their own revenues. They must have some support from the power revenues from Glen Caynon.

Senator WATKINS. It is not a question of repayment, when you are evaluating the power itself. Isn't it a question of the benefit to be received, as it compares with the cost?

Mr. TUDOR. That is correct, sir. I am not familiar with the chart you refer to, so I can't comment on that in detail.

Senator WATKINS. For instance, I have a chart on the State of New Mexico. Do you have that before you?

Mr. TUDOR. I have it before me, sir.

Senator WATKINS. It is a mimeographed copy. I don't know where it came from.

Mr. TUDOR. Mr. Chairman, Mr. Larson prepared this, I believe, and he is here and could answer questions relative to this chart much more competently than I could, sir.

Senator WATKINS. I think probably it is only fair to you to ask Mr. Larson. I know you cannot take care of all of this detail yourself on these numerous projects. But inasmuch as you made the statement, I wondered if that was exactly what you meant by the answers that you were giving to Senator Anderson.

I notice, for instance, from this chart on the Navaho, that it is an irrigation project of 44,000 acre-feet; that the Navaho Reservation maintains canal and pumping plants, with a construction cost of \$53,825,000, on a nonreimbursable cost; and repayment by water users of \$6,140,000, with assistance from net power revenues of \$7,939,700.

And yet the benefit-cost ratio to benefits is 1.2 to 1.

In other words, the benefits were two points over the cost.

Mr. TUDOR. There is a difference between the benefits and the revenues. You will notice that the summation of the repayment by water users is \$6,140,000, the assistance from power \$47,685,000, and the summation of those 2 is equal to the cost of the project, \$53,825,000. That is 1 to 1.

Senator ANDERSON. Do you not have to add \$47 million of revenue from the breadwinners, the big projects, in order to bring the benefits cost up to 1.2 to 1?

Mr. TUDOR. 1.1, sir.

Senator ANDERSON. 1.1. It is here.

Mr. TUDOR. That is the point. The benefits that we are talking about there are not the revenues. They include direct and indirect benefits.

Senator ANDERSON. I will ask the question in another way and Mr. Larson can answer it. Take the Navaho Shiprock division, 151,000 acres in it, project construction cost is listed as \$178 million, and a benefit ratio of 1.2 to 1. I recognize that they have to take the power revenues that come from Glen Canyon Dam and the other dams, Flaming Gorge and Echo Park and the rest of them, in order to bring down the cost to irrigation to about \$13 million, but the benefit ratio will be 1.2 to 1.

Mr. TUDOR. You have to bring that money down to pay for it, but there is a difference between the payout and the cost as compared to the benefits-cost ratio. Mr. Larson has the details on that and he can give you those details. I cannot, sir, I do not have them.

Senator ANDERSON. I don't want to start Mr. Larson's testimony now, but if he wants to answer the question as to the benefit of each project exceeding its cost, what you mean by that statement, I would be glad to have him do so.

Senator WATKINS. I think, Senator Anderson, it may be more orderly procedure if we withhold until we get Mr. Larson on the stand. We can get that information from him. Each one of these witnesses only testifies about a certain phase, and we will probably prolong the examination a long time and will not get very much either, unless we limit our questioning to that phase, because they are not all prepared to testify on that particular project.

Senator ANDERSON. I did not want Mr. Tudor to get away and then ask Mr. Larson what Mr. Tudor meant by saying that these reports have to include certification that the benefits of each project exceed its cost. I want to be sure that somebody answers the question about what you mean by the benefits exceeding cost in each particular instance. If Mr. Larson can answer it, fine. But I want to take the Navaho project specifically.

The next sentence of your statement this morning is:

It is also recommended that these further reports include a joint study with the Department of Agriculture on the direct agricultural benefits of each of these projects.

Isn't that a little hard to do? What level of agricultural supports are you going to figure, 90 or 75 percent in that?

Mr. TUDOR. This, as I understand it, and as we recommend it, it is that when we recommend one of these projects which includes agriculture, we will have a report from the Department of Agriculture accompanying our report so that the Congress may have the information from both departments.

Senator ANDERSON. Of course the Department is going to have to guess a little bit in the future on this particular type of thing. This isn't the place where these people will be able to grow a cash crop that has a readily obtainable market value. As I understand it, in the Navaho project they expect to divide this up in to about 60-acre tracts, in which the Navahos may use about 40 acres for grazing. What his pastures are worth for grazing is sometimes indefinite. I have sold alfalfa for \$4 a ton and \$45 a ton. It is now selling for \$25 a ton. The price has a tendency to vary.

Mr. TUDOR. Necessarily the prices will have to be an estimate in any event.

Senator ANDERSON. I am wondering a little bit about this question of the evaporation loss in those dams. The figure you gave originally

was from 100,000 to 200,000 acre-feet per year. And you said, and I am quoting:

There has been some question as to the accuracy of the estimate of evaporation and the application of formulas used to compute losses. I have reviewed this matter.

Subsequently the testimony was that the figures should have been about 25,000.

Mr. TUDOR. That was on the Glen Canyon; yes, sir.

Senator ANDERSON. That is not comparable to this 100,000 figure?

Mr. TUDOR. No; the high Glen Canyon would have an evaporation loss of approximately 25,000 acre-feet more than the combination of the Split Mountain and Echo Park, if it were substituted for the latter two.

Senator ANDERSON. You think, then, that it is proper to leave out of this Senate bill these projects, completely blanketing 1 State out of it at this time?

Mr. TUDOR. It was not done, of course, with the thought in mind that any particular State would be left out. It was done primarily because we do not have as much data on that project as we do on others. It was specifically said that it was without prejudice to that project. Also, the legislation anticipates that additional participating projects may be added from time to time in the future. I would say this, that if it is added, in the wisdom of the Congress, that it should be placed in here, I would recommend that it be placed in here under the same restrictions, contingent authorization, that the other participating projects are included under.

Senator ANDERSON. If it was placed in there under the same conditional authorizations and restrictions which are placed on the other project, would there still be objection to it?

Mr. TUDOR. I don't think there would be any objection to that, sir. It would be a question of a report justifying its feasibility at a later date.

Senator ANDERSON. Well, if it develops subsequently that you have more studies on the shiprock project than you have on the LaPlatta project, then you would say that the shiprock project had more justification, would you not?

Mr. TUDOR. No; I would not say the simple matter of having more studies would be a justification.

Senator ANDERSON. What would be the yardstick? I know there have been studies upon studies of the Navaho project. I went over a great deal of the project when the engineers were at work on it years and years ago. At one time we thought we had the project ready to where a feasibility report could be given on it almost daily. But it has been held up. I wonder if the thought is in the mind of anybody that there is conflict within the State of New Mexico and therefore the easy thing to do is not report on the project.

Mr. TUDOR. I believe there is conflict as to the Indian matters. The Indian matters have not been completed, I believe.

Senator ANDERSON. The Indian matters have not been completely settled. But the Indians have been getting along pretty well with the other people in the State. They have had a very reasonable attitude on the water problem, so far as I can see. All classes of people in New Mexico are anxious that this project get under way at the

earliest possible date. I am trying to find out what it was that kept it out of the preferred list.

Mr. TUDOR. Again I would say this, we would not be too seriously concerned whether that was included or not.

Senator ANDERSON. I am happy to have that, because that is a fine start.

Mr. TUDOR. Mr. Larson has some further information on the details there. But as of today our information is not as good and complete as it is on other projects. But so long as it was restricted as the others are, for contingent authorization, no great harm would be done.

Senator ANDERSON. You say that no great harm would be done by conditional authorization, and I completely agree with you; I do not think any harm would be done. I think a great field of work has been done, a great deal of study has been given to this project, some very fine people have worked on it out in the field, some very fine people have worked on it in the regional offices and in Washington. We would like to see it end so that studies can go forward. Personally, I feel also that the State of New Mexico, having developed a policy on these projects, a policy that is subscribed to by all the members of the congressional delegation, and which was agreed to by the Indians, as near as I can tell, and by everybody else, it would be well to make some headway on it. We get discouraged when we see the bill without mention of our State in it. I think that is all.

Senator KUCHEL. Mr. Chairman, may I ask some questions?

Senator WATKINS. Proceed.

Senator KUCHEL. First of all, Mr. Secretary, has there been prepared by the Department of Interior an official report on the legislation before this committee now?

Mr. TUDOR. There was an official report prepared and sent to the committee, I think, on March 31. It was addressed to the Honorable Richard M. Nixon, President of the Senate.

Senator WATKINS. I will advise the Senator that Senator Millikin had the report of the Department to the committee placed into the record. That was one of the first documents.

Senator KUCHEL. I will ask the chairman on that point, likewise, has the report of the Bureau of the Budget been made a part of the record of these proceedings?

Senator WATKINS. It has.

Senator KUCHEL. Mr. Secretary, I cannot consider myself any expert in any degree on the great questions that are involved in this piece of legislation. I do take it for granted, however, that the Colorado River compact, the Boulder Canyon Dam Act, the treaty between the United States and Mexico all constitute valid statutes or treaties or understanding which it is not the desire of the Bureau to abrogate in advocating the bill before this committee.

Mr. TUDOR. I think that question came up this morning, and my answer was that the recommendations here are intended to be within the compacts and the treaties and the laws that have been passed.

Senator KUCHEL. And it is also true, is it not, that the questions in litigation before the United States Supreme Court, in which the State of Arizona has filed suit against the State of California, do raise matters that would be relevant to the Senate bill?

Mr. TUDOR. I don't know whether they do or not, sir. I am not aware of it, if they do.

Senator KUCHEL. It has been said, for example, that the theory under which the Bureau of Reclamation or the Department would view the apportionment of the 7,500,000 acre-feet per annum means, so far as the Bureau's interpretation is concerned, an average amount over a period of years, so that were less water apportioned 1 year under the reservoirs built pursuant to this bill, there could be a concomitant increase or additional apportionment the following year, so long as the average of 7½ million acres a year were maintained?

Mr. TUDOR. It is my understanding that is 75 million acre-feet over a 10-year period. The effect would be to balance it out over a 10-year period.

Senator KUCHEL. So it would be the Bureau's interpretation that the average annual apportionment would be in keeping with the law and with the compact?

Mr. TUDOR. I think that is correct, sir.

Senator KUCHEL. I am told that in the lawsuit which has been filed, that does constitute one of the issues, whether or not the apportionment should be on a year-to-year basis of 7½ million acres, or whether it would be as the Department believes. So to that extent, if that is true, it would have an effect, that is to say the decision of the Supreme Court would have an effect, would it not, upon the manner in which the Department would administer this legislation?

Mr. TUDOR. I am not familiar with the details of the case to which you refer, so I wouldn't be competent to answer that question, Senator.

Senator KUCHEL. With respect, however, to the Boulder Canyon Dam Act and the Colorado River compact and the treaty, would the Bureau look with favor upon an amendment to this legislation, specifically providing that this bill was not intended to and would not affect any of those instruments?

Mr. TUDOR. Well, I don't see the need for that now, sir. I would like to give it consideration.

Senator KUCHEL. It did represent, I note, one of a group of recommendations which were made by officials representing the government of California, and I wonder if the Department of Interior would study those recommendations and advise the committee of its feelings with respect to them.

Mr. TUDOR. I would be very glad to, sir. I am not familiar with it particularly. Was that the one sent in by the State, commenting on the legislation, sir?

Senator KUCHEL. Yes; I believe so. Or at any rate I could arrange to have them sent to you.

Now, if I understand the legislation generally, it specifically authorizes 2 projects at the moment, and then as Senator Anderson developed, it indicates some type of conditional authorization of some 13 other projects, or at any rate a number of other projects.

Mr. TUDOR. Eleven others; yes, sir.

Senator KUCHEL. And which, if I heard you testify correctly, would not be authorized until Congress took subsequent action and specifically authorized them?

Mr. TUDOR. No, sir. These 11 participating projects?

Senator KUCHEL. Yes.

Mr. TUDOR. No, sir. The conditional authorization is subject to a report by the Secretary to the Congress and to the President, certifying that those other projects at the time appropriations are sought, will meet with certain specific requirements.

Senator KUCHEL. By which the Congress would report to the President.

Mr. TUDOR. No, the Secretary would report to the President and to the Congress, certifying to those two bodies that these particular projects then met with certain minimum requirements.

Senator KUCHEL. So if this bill were enacted into law, we would then have a complete authorization so far as Congress is concerned, to at least the 13 separate projects, and all that would be necessary thereafter would be the appropriations of the requisite amounts of money to proceed to build them?

Mr. TUDOR. To the extent only that the Secretary would have to certify that each of these projects, as he recommends them and seeks appropriation, do meet with certain minimum requirements which are set up in this legislation.

Senator KUCHEL. Would that mean, Mr. Secretary, in your judgment, that it would be impossible now to inform this committee of the cost of the entire series of projects as are envisioned in this bill?

Mr. TUDOR. We could make an estimate of their cost at this time, which we have available. But realize, of course, that the cost of construction at some future date may be different from what it is now. There may be some changes in the design of the project. We might put a rock fill dam in lieu of a concrete dam and reduce the cost, or something like that. But we can give an estimate now of what we think those costs will be.

Senator KUCHEL. Have you supplied that estimate to this committee?

(This point was developed in later testimony.)

Mr. TUDOR. I think we have. If we haven't, we will be glad to do it.

Senator KUCHEL. Can you state on your own information what the total cost is with respect to all the projects authorized by this bill?

Mr. TUDOR. I cannot state from my own memory, but I can get that figure for you right away, I think.

Senator ANDERSON. \$1.100 million is roughly the total cost, is it not?

Mr. TUDOR. It is something of that nature; yes, sir.

Senator KUCHEL. And that is your estimate of the entire cost, were all of the projects authorized or conditionally authorized, on the basis of present costs?

Mr. TUDOR. Of these projects named in the recommended legislation, yes, sir.

Senator ANDERSON. May I ask a question at that point?

Senator KUCHEL. Yes.

Senator ANDERSON. One question I overlooked, Mr. Tudor, was on this statement of yours on the bottom of page 5. You said:

We also recommend a provision be made for financing the entire undertaking through a separate revolving fund to be established in the Treasury of the United States.

Would that fund be available for the projects that are not authorized now, or would it apply only to the 11 recommended participating projects?

Mr. TUDOR. It would include any subsequently authorized projects in the upper Colorado River Basin, sir.

Senator ANDERSON. Therefore, these 11 that are recommended by the Department now would not have a preference or a priority in this financing, if Congress came along subsequently and added the Navaho project to it.

Mr. TUDOR. It is not our intention that it would set up such a preference or priority, sir.

Senator ANDERSON. Thank you.

Senator KUCHEL. You name the administration of the projects if they came into being. If the Department of the Interior were to find that the Supreme Court of the United States ruled against the theory upon which the Department of the Interior was proceeding, I suppose your statement would be that the Department of the Interior would change its ground rules, so-called, and proceed in accordance with the decree of the Court?

Mr. TUDOR. I have no idea of what such a decision might be, but certainly the departments would have to abide by any order of the Supreme Court.

Senator KUCHEL. I go back to the question which is part of the litigation on which Arizona has sued California, and if the Supreme Court found that 7,500,000 acre-feet meant that amount of water to be delivered each year, then obviously the Department of the Interior would abide by that decision, although it was not a party to the lawsuit?

Senator WATKINS. Is that the contention of California, that there must be 7,500,000 delivered each year?

Senator KUCHEL. That is a matter, I might say, Mr. Chairman and members of the committee, that is before the Supreme Court today. So that the chairman and members of the committee will clearly understand the position of the junior Senator from California, I have been here today, this morning, and I intend to be here during the balance of the hearing. I do not think in a discussion of this bill and in the search for the truth of it, recriminations need to be engaged in.

This morning on at least one instance, one brother of mine in the Senate made some rather harsh statements which I do not think are a part or ought to be relevant to these proceedings. Speaking for myself, I am trying to educate myself with respect to the problems that are involved here. If the representatives of the people of California are correct, and if the present legal rights of the people of California were to be interfered with by the legislation, I am sure the Department of the Interior would recognize that it did not want any legislation which would interfere with the rights of California or of any other State. It is on that basis that I am trying to develop this information as much as I can.

Senator WATKINS. I am not criticizing the Senator for trying to develop information. If that is the contention of California, that is the first time I have heard them contend that we have to deliver 7.5 million acre-feet each year. I understood it was generally accepted that we must deliver at least 75 million in a 10-year period.

Senator KUCHEL. At any rate if the Supreme Court were to decide that the compact did so require each year the apportionment of that amount of water, I am sure the Department of Interior would take

notice of that interpretation of the compact by the Supreme Court and abide by it, would it not, Mr. Secretary?

Mr. TUDOR. We could do nothing less than that, sir.

Senator KUCHEL. Mr. Secretary, can you testify as to whether or not there is historic precedent for the type of authorization which this bill contains, that is to say, an authorization as far as Congress is concerned which requires only thereafter the findings by the Department of the Interior of certain facts and a report thereto to the President?

Is there precedent for that type?

Mr. TUDOR. I believe there is, Senator. I am not familiar with it in detail. But as I recall it, the reclamation law did authorize the Secretary to certify to the authorization of certain projects, and if I am not mistaken, such action was taken in the case of the Trinity River project in 1952. Self-authorization it was called.

Senator KUCHEL. How many projects were involved in that authorization?

Mr. TUDOR. That I don't know, sir. I believe that was general authorization rather than specific.

Senator KUCHEL. Is it not true that in that instance there was only one project involved, however, Mr. Secretary?

Mr. TUDOR. I don't know how many times the authorization was used by the Secretary, but it is my impression that there was a general authority for doing it, and that it has been used a number of times. We can, if you would like, collect some data on that.

Senator KUCHEL. Is there precedent for the provision that your bill contains relative to the creation of a revolving fund?

Mr. TUDOR. I don't think there is in this specific instance. I think the effect of this has been used elsewhere, and that this makes it, I believe, on a much better and sounder basis. For example, the matter of a basin account, which really this enunciates, is in effect in the Columbia Basin. It has been implemented by virtue of the postage stamp rate, where the electricity of the various generating plants is sold at a common rate, Hungry Horse, Bonneville and so forth.

The same general effect is also implemented in the Central Valley of California, where the power of Shasta, for example, is used as a fiscal medium for supporting reclamation projects in the valley. They have never been set out in clearcut, crystal procedures such as this, and we believe this is a clear way of doing it.

Senator KUCHEL. Is it not true, however, that in the case of the project in California, its development annually has been entirely dependent upon the annual decision of Congress as to what, if any moneys, are to be appropriated?

Mr. TUDOR. That would be the case here, too.

Senator KUCHEL. By the creation of a revolving fund you would still require appropriations of Congress to feed in moneys as they went out in construction?

Mr. TUDOR. That is correct. For instance, in (c) of my statement—

be available for operation and maintenance of the project, subject to such limitations as may be imposed by the Congress in annual appropriations.

Senator KUCHEL. But with respect to (b), receive all revenues connected with operation of the project.

Presumably those revenues would feed your revolving fund so that the revolving fund thereafter might be used not merely by appropriations but also by revenues for the construction of the projects?

Mr. TUDOR. No, we wouldn't make any expenditures from the revolving fund except with the approval of Congress. It would not be the kind of revolving fund which is at the full disposal of the Secretary.

Senator KUCHEL. Could you point out where in the bill that limitation appears?

Mr. TUDOR. It is in section 4 of the proposed bill, Senator.

Senator WATKINS. The proposed bill you are speaking of, Mr. Secretary, is not S. 1555; is it?

Mr. TUDOR. No, that is not the Senate version. It is the recommended bill that we put in, sir. We recommended those limitations be put on the expenditures.

Senator WATKINS. In other words, it is not in the bill that was introduced?

Mr. TUDOR. No, sir; I think it is not. It is in the recommendations that we made to that bill.

Senator KUCHEL. Could you, Mr. Secretary, supply the committee with the several recommendations which the Department has made that do not appear in the Senate bill so that we could see the distinction between the Department's recommendations and the Senate bill?

Mr. TUDOR. Yes, sir. We will have to build that up and show you the differences between them, but we will do that.

(The information referred to, when received, will be considered by the committee and retained in the committee files.)

Senator KUCHEL. I have no further questions.

Mr. TUDOR. You have our recommendations, but the comparison has not been made.

Senator KUCHEL. Yes. That is so that we have something before us to that we can see where the bill before us is different from the recommendations.

Senator WATKINS. Senator Anderson, have you finished?

Senator ANDERSON. I have. Thank you, Mr. Chairman.

Senator WATKINS. Thank you, Mr. Tudor.

We will next call Mr. E. O. Larson, regional director of the Bureau of Reclamation in Salt Lake City, Utah.

You may proceed, Mr. Larson.

**STATEMENT OF E. O. LARSON, REGIONAL DIRECTOR, REGION 4,
BUREAU OF RECLAMATION, SALT LAKE CITY, UTAH, ACCOMPANIED BY C. B. JACOBSON, PROJECT ENGINEER, COLORADO RIVER STORAGE PROJECT**

Mr. LARSON. My name is E. O. Larson. I am regional director of region 4 of the Bureau of Reclamation, with headquarters at Salt Lake City, Utah.

Senator WATKINS. You will have to speak up. It is a little difficult for us to hear in this end of the room. I am sure the other witnesses will be glad to hear you at the same time.

Mr. LARSON. Before I begin my statement, Mr. Chairman, I would like to point to the map on the wall showing the major dams and

dam sites for river regulation and project works for the entire Colorado River Basin. The Colorado River rises in the high mountains in west central Wyoming.

Senator WATKINS. Mr. Larson, I believe it would probably be a little better if you would go to the map, because we tend to watch the man who is pointing and at the same time try to listen to you, and it is difficult. If we can get the words and pointing together, it would be easier to understand you.

Mr. LARSON. The Colorado River rises in the high mountains in west central Wyoming and flows in a southwesterly direction, a distance of about 1,200 miles, into the Gulf of California.

The map shows the team of 9 reservoirs for the upper basin, the location of the dams and diversion dams constructed along the river in the lower basin, and the 11 participating projects in the upper basin, the location of which are shown by red dots. The Colorado River Basin is very large. It covers 110,000 square miles in the upper basin and 132,000 square miles in the lower basin.

Senator KUCHEL. 132,000?

Mr. LARSON. 132,000; pardon me.

The basin includes the Green River Basin in Wyoming, all of Colorado west of the Continental Divide, all of Utah east of the divide of the Wasatch Mountains, and the San Juan Basin in New Mexico, that is the tributaries of the San Juan River; a small area in the northeast corner of Arizona, down to the dividing line between the upper and lower basins at Lees Ferry, which is a point on the Colorado River in Arizona about 30 miles south of the Utah-Arizona line.

Senator WATKINS. While you are there, would you indicate now the sites on the main stem of the river, the nine storage projects contemplated in this legislation? Point out the location on that map.

Mr. LARSON. Beginning at the top, I first refer to the Echo Park Dam site, just below the confluence of the Yampa and the Green Rivers within the State of Colorado. Immediately above the Echo Park site on the Green is the Ashley Dam site, for the generally known Flaming Gorge Reservoir. Immediately above the Echo Park Reservoir on the Yampa River is the Cross Mountain Dam site. Just below Echo Park is the Split Mountain Dam site. Going on downstream, about 22 miles north of Green River, Utah, is located the Gray Canyon Dam site on the Green River. Over on the Gunnison River, the White Water Dam site is located near Grand Junction. Going upstream the next site is the Crystal Dam site. Up above the Crystal Dam site is the Blue Mesa Dam site for the generally known Curecanti Reservoir. On the main stream of the Colorado River, just a few miles upstream from Lees Ferry, is the largest site of all, the Glen Canyon Dam site. Another large reservoir site pertinent to our discussion and the bill is the Navaho site on the San Juan, just south of the Colorado-New Mexico State line.

Senator WATKINS. Will you indicate, while you are there, the construction that has been done in the lower basin, the projects that have been built?

Mr. LARSON. In the lower basin, beginning at the top, there are the Hoover, the Davis, and Parker Dams—I am not too familiar down there. Of course, the Imperial diversion dam and the Moreles Dam,

the lowest one; also at **Headgate Rock**, there is a diversion and a new dam, I believe, is proposed there.

Senator **WATKINS**. At how many sites in the lower basin do they have powerplants?

Mr. **LARSON**. The large powerplants are installed at **Hoover**, **Davis**, and **Parker**, and there is a powerplant at **Pilot Knob** wasteway on the **All-American Canal**.

Senator **WATKINS**. That is being built by the **Imperial Valley Irrigation District** with its own funds and under its own auspices, is it not?

Mr. **LARSON**. That is my understanding. The important reservoir sites in the lower basin are: the **Marble Canyon** site, a short distance downstream from the **Glen Canyon** site, and the **Bridge Canyon Reservoir** site just above the backwater of **Lake Mead**, and **Hoover Dam**.

Senator **WATKINS**. Do you have a prepared statement or can you give for us a statement on the amount of money that has been spent in the lower basin by the United States through the Bureau of Reclamation.

Mr. **LARSON**. I am sure that figure can be furnished in the morning, Mr. Chairman, but I do not have it here.

(The information requested is as follows:)

Reclamation expenditures in lower Colorado River Basin States through June 30, 1953

	Actual expenditures	Present value (based on English News Record Index)
Arizona.....	\$65, 812, 812	\$190, 276, 400
Arizona-California.....	1 45, 727, 310	94, 174, 900
Arizona-Nevada-California.....	1 337, 196, 753	701, 356, 700
Total.....	448, 736, 875	985, 808, 000

¹ Because of the physical location of certain structures, such as **Hoover Dam**, expenditures cannot be readily separated between States.

In addition to lower Colorado River expenditures the following amounts have been expended elsewhere in those States:

	Actual expenditures	Present value (based on English News Record Index)
California.....	\$433, 998, 206	\$792, 421, 300
Nevada.....	10, 972, 537	43, 978, 100
Nevada-California.....	1, 073, 410	3, 327, 600
Total.....	446, 044, 153	839, 727, 000
Grand total.....	894, 781, 028	1, 825, 535, 000

Senator **WATKINS**. You may take your seat, then, and go on with your statement.

Mr. **LARSON**. The legislation before you is the culmination of many years of effort by State and Federal agencies to develop the water resources of the upper Colorado River Basin. Without this develop-

ment, the economy of a vast area of potential wealth cannot grow, and the States and the Nation will be denied its riches.

I shall briefly review the background of this legislation because an understanding of the problem facing the States of the upper basin in the use of its water, and the steps that have been taken to plan for such use are important in your consideration of this bill (S. 1555). Many of you are familiar with this background, but I believe a repetition of the essential facts is desirable and should be a part of this record.

The Colorado River compact of 1922 requires a delivery at Lee Ferry, the point of division between the upper and lower basins, of not less than 75 million acre-feet over any consecutive 10-year period. There are further provisions in the compact relating to surplus water, but this is the controlling and important limitation. With the uneven flow of the Colorado River—erratic periods of drought and flood—substantial water development in the upper basin is impossible under this limitation without river regulation.

Our studies show that unless there is adequate storage to harvest floodwaters, only 58 percent of the water apportioned to the upper basin could be used, and even that at some risk of periodic shortages.

After some 20 years of investigations, the Bureau of Reclamation issued the Colorado River report in 1946 covering potential development on the entire Colorado River and including over 100 irrigation and power projects in the upper basin. This report was an inventory and served as a guide for planning and compact negotiations.

In 1948 the upper Colorado River compact was signed apportioning the water among the States of the upper basin. This was a comprehensive document covering the many phases of interstate and intrastate river development, and making specific plans for the use of Colorado River water possible. With that as a foundation, the Bureau of Reclamation issued in 1950 the report Colorado River storage project and participating projects with supplements.

Presented in the report was a plan for ultimate development of the upper Colorado River Basin in terms of storage, but only for partial development in terms of water utilization. This plan encompassed a system of 10 major storage reservoirs and powerplants on the main stem and important tributaries of the Colorado River which is designated the Colorado River storage project, and an initial group of participating irrigation and multiple-purpose projects on the tributaries which is called participating projects.

The proposal, however, is such as to permit additions to the plan of other such participating projects as they are investigated and found to be feasible. Recommended in that report for initial construction were 5 storage units and 11 participating projects.

The 10 reservoirs, later reduced to 9 when the Navaho Reservoir was included in the Navaho participating project, were designed to regulate the flow of the river to allow for both the delivery of water to the lower basin and the full use of apportioned water in the upper basin. They would provide 23 million acre-feet of active storage, capacity for minimum power heads, fish propagation, and space for 200 years of sediment deposition; in all 47 million acre-feet. No single site on the Colorado River or its tributaries is capable of storing that amount of water, which is one and a half times as great as the capacity of Lake Mead.

The initial energy output at the powerplants would be 9 billion kilowatt hours annually which would be reduced many years hence to an ultimate 6 billion. Estimated market demands for hydroelectric energy in the upper basin would require the total installed powerplant capacity within 20 years.

The 11 participating projects in the 1950 report, to which was added the Shiprock project at the request of the Bureau of Indian Affairs, were for the utilization of the water made possible by the regulatory functions of the storage reservoirs. These uses include irrigation of new land, supplemental water for presently irrigated lands with inadequate water supplies, water for municipalities and industry, as well as recreation and fish and wildlife purposes.

In December 1953 the Secretary of the Interior submitted his supplemental report to the President proposing authorization of 2 units of the storage project, Echo Park and Glen Canyon, and 12 irrigation and multiple-purpose units. One of these, the Shiprock division of the Navaho project, has since been withdrawn. The proposals in this supplemental report are the basis for S. 1555, now before you, which includes 2 additional units of the storage project and 4 additional participating projects. The Navaho Unit, one of the additional units in the bill, would be developed later under the Department's plan as a reservoir for the Navaho participating project.

I first wish to cover briefly the proposals of the Secretary and to the extent necessary their relation to the plan for ultimate development of the upper Colorado River. I shall also describe the additional units and participating projects in the bill. A controversy has developed over the proposal to build the Echo Park Dam, and confusion exists over the necessity for this unit and reasons for its inclusion in the plan. I shall attempt to clarify this issue in my statement.

The Colorado River storage project: The Echo Park and Glen Canyon units of the storage project are essential parts of the plan for regulation of the upper Colorado River through which the provisions of the Colorado River compact can be met, and apportioned waters can be used in the upper basin. Although the nine regulatory reservoirs proposed in the plan are generally below the major points of diversion in the upper basin, they serve essentially the same purposes as reservoirs above points of diversion. This is achieved through a replacement practice not unusual on western streams where water is diverted upstream in exchange for storage water releases from downstream reservoirs.

Records over a long period of years show that there is an adequate water supply to assure initial filling of these reservoirs even if drought conditions should prevail. The time required for construction and filling them, however, necessitates initiation of the work at least 20 years before the need for supplementing Lee Ferry flows.

The units of the storage projects in addition to their regulatory functions would provide vital sediment control and would generate power desperately needed for continued economic growth of the upper basin. As I shall explain more fully later on, the anticipated net revenues from the sale of energy at an average rate of 6 mills per kilowatt hour delivered to the load centers by either Federal or other means of transmission would be sufficient under the plan to retire with interest the entire construction cost of the storage project allocated

to power. In addition these revenues would furnish financial assistance to irrigation under the participating projects and make possible over a 50-year period complete repayment of the interest free irrigation construction costs of these projects.

The total consumptive use of all constructed projects, those authorized, and projects under construction, is approximately $2\frac{1}{2}$ million acre-feet, or one-third of the $7\frac{1}{2}$ million acre-feet annual allotment to the upper basin. The 11 participating projects being recommended by the Department of the Interior would increase present consumptive uses by an additional 400,900 acre-feet of water annually. With expedited development in the future, it may be that in the next 75 years the remainder of the upper basin's share of Colorado River water will be put to beneficial use.

Glen Canyon unit: Glen Canyon Dam would be on the Colorado River in northern Arizona approximately 13 miles downstream from the Utah-Arizona border, and 15 miles upstream from Lee Ferry. On the basis of preliminary studies it would be a concrete curved gravity-type structure rising 700 feet above bedrock and 580 feet above the river. As the reservoir should be built to its economic capacity, the final design height of the dam will depend on engineering and economic factors, and cannot be determined until precise engineering data are made available during preconstruction activities. The reservoir would offer final regulation for deliveries to the lower basin under the Colorado River compact. Out of a total capacity of 26 million acre-feet, 20 million acre-feet initially would be active capacity. The reservoir when filled would have a normal water surface area of 153,000 acres and would extend about 187 miles up the Colorado River, nearly to the mouth of the Green River, and 71 miles up the San Juan River. The reservoir would be the principal sediment depository in the upper basin. In 200 years at the present rate of sediment flow in the river and with upstream storage developed as planned, sediment deposits would fill all inactive storage space and reduce the active storage space by more than half.

A powerplant would be located near the toe of the Glen Canyon Dam. It would consist of seven generating units for a total installed capacity of about 800,000 kilowatts, or approximately one-half the total capacity contemplated for the entire Colorado River storage project. The total construction cost of the Glen Canyon unit, with an appropriate assignment of transmission costs is estimated at \$421,300,000.

Echo Park unit: The Echo Park Dam would be located in Colorado on the Green River about 3 miles east of the Utah-Colorado State line and 3 miles below the junction of 2 major tributaries, the Green and the Yampa Rivers, in the tricorn area of Colorado, Wyoming, and Utah. The dam would be a concrete curved gravity-type structure rising 690 feet from bedrock and 525 feet above the river. The reservoir would have a storage capacity of 6,460,000 acre-feet, including 5,460,000 acre-feet of live capacity. When filled to capacity, the reservoir would have a surface area of 43,400 acres and would extend 63 miles up the Green River and 44 miles up the Yampa River.

The powerplant at the dam would consist of four 50,000 kilowatt units for a total capacity of 200,000 kilowatts. The construction cost of the Echo Park unit is estimated at \$176,400,000, including an appropriate part of the basic transmission system.

Interconnection Glen Canyon and Echo Park: The first filling of the reservoirs requires electrical interconnection between the Glen Canyon and Echo Park units and existing plants in the lower basin. This interconnection would also permit greater flexibility in power operations, increasing the firm power production of the system, and making possible the delivery of Glen Canyon power to load centers in the upper basin. The initial lines will constitute the backbone of the ultimate transmission grid to which subsequent powerplants would be added as increments in the system regardless of what transmission lines are built by private or preference customers or by the Federal Government.

Justification for Echo Park Dam: The Echo Park Reservoir, with its large capacity and strategic location would regulate the flows of the Green and Yampa Rivers not performed by other upstream sites at Flaming Gorge and Cross Mountain. This same regulation would increase the efficiency of Flaming Gorge, Cross Mountain, Split Mountain, and Gray Canyon units for both storage and power generation. In addition, evaporation losses at Echo Park are lower than at any other sites possessing major storage possibilities in the upper reaches of the Colorado River Basin. This factor alone, in an area where evaporation losses are high and water so precious, is a compelling reason for its inclusion. I wish to stress, too, that Echo Park is in the heavy power market area of the upper basin. In effect, Echo Park is sound from an engineering and economic standpoint, and is a vital part of the total plan.

Opposition to Echo Park is based on its effect on the Dinosaur National Monument. Proponents on the other hand claim that a substantial increase in recreational values of the Dinosaur National Monument will be possible as a result of the building of Echo Park Dam.

Persistent claims have been made that satisfactory substitutes for Echo Park exist. The most favorable alternate site to Echo Park would be Dewey, on the Colorado River 30 miles upstream from Moab, Utah. Annual evaporation from this site is estimated at 215,000 acre-feet. This would involve an additional annual evaporation loss of 120,000 acre-feet over the combined losses of 95,000 acre-feet at Echo Park and Split Mountain. With such a substitution there would also be a loss to the power system of 188,000 kilowatts annually.

Although evaporation losses at the New Moab site on the Colorado River just above Moab, Utah, would be slightly less than at Dewey, this reservoir would inundate a portion of the Arches National Monument and would therefore face the same criticism that has been directed against Echo Park Reservoir.

A higher Glen Canyon Dam has been considered by some as an alternative to Echo Park Dam, but we do not consider such a substitute possible. Regardless of differences or arguments on evaporation, the Glen Canyon Dam should be constructed to the maximum height consistent with economy, safety of the structure, and adequate protection of the Rainbow Natural Bridge. From our preliminary studies a dam rising 580 feet above the river creating a reservoir of approximately 26 million acre-feet would meet these criteria.

Final detailed engineering studies for the safe height of the dam may result in a capacity of slightly more or even less than 26 million

acre-feet. If the capacity is less than the 26 million acre-feet, additional capacity must be sought elsewhere. If it is more than 26 million acre-feet, such increase should be used to compensate for a lowering of the Curecanti Dam and possible changes resulting from final surveys at other sites, to replace capacity of the less attractive upstream sites, or to lengthen the silt retention period beyond 200 years.

Participating projects: The 11 participating projects recommended by the Secretary for construction are: LaBarge, Seedskafee, and Lyman, in Wyoming; Silt, Smith, Fork, Paonia, Florida, and Pine River extension, in Colorado; Emery County and central Utah (initial phase), in Utah; and Hammond, in New Mexico.

Irrigation from these participating projects will bring into agricultural production 132,360 acres of new lands, and in addition supplemental water will be provided 233,930 acres of presently irrigated land having inadequate water supplies. These projects would consume approximately 400,900 acre-feet per annum or about 5½ percent of the waters allocated the upper basin from the Colorado River. Consumption of water by these projects will have no significant effect on the quality of the water now being diverted by downstream users.

The cost of constructing the 11 initial participating projects approximates \$304,356,000, of which \$6,908,000 would be allocated to nonreimbursable purposes such as flood control, fish and wildlife propagation, and recreation. Of this total cost, \$46,699,000 will be repaid with interest by power users, and \$45,500,000 will be repaid with interest by users of municipal water, both under the initial phase of the central Utah project.

In addition to their annual operation and maintenance charges, the irrigators on the 11 participating projects will repay in accordance with their ability \$35,047,000 in 50 years, or about 17 percent of the \$199,749,000 allocated to irrigation. The remainder will be repaid by power revenues of the Colorado River storage project.

Considerable variation exists in the abilities of the irrigators to repay their costs due to several reasons, including the differences in productivity of the land and operation and maintenance costs. The repayment ability of the irrigator, however, is not the controlling factor in determining the economic justification of irrigation projects which result in benefits to the Nation as a whole.

In determining the economic justification, net benefits resulting from these projects must be compared with the appropriate costs. Consequently, in determining the benefit-cost ratio, such costs involve amortization with interest at 2½ percent of the total Federal investment in the participating project and a pro rata share of the irrigation allocation in the storage project plus the necessary costs of operating and maintaining the participating project. The net benefits are those of the irrigator and adjacent populations plus others of national value such as the profits resulting from the manufacture and sale of goods used in farm operations. Using this method all of the recommended participating projects have benefits in excess of their respective costs amortized at 2½ percent interest.

In addition to these 11 participating projects, the Eden project in Wyoming, nearing completion, is included in the Secretary's recommendations as a participating project. This is in conformance with the authorizing legislation of the Eden project.

Brief statements on each of the initial participating projects are attached and further details can be found in the supplements to the Colorado River storage project report.

Legal framework: In a plan of this magnitude the authorities and laws under which the various features would be constructed, administered, and operated would normally present serious problems and certainly would raise grave questions of jurisdiction. The plan before you is happily free of such complications. The storage project with its regulatory reservoirs is of interstate significance, and each of its units would be so treated. These would be constructed, operated, and maintained by the Bureau of Reclamation and, as far as water is concerned, would be operated in conformance with the Colorado River and upper Colorado River Basin compacts, the latter a document so comprehensive that its provisions cover all necessary aspects of such operation. The participating projects are consumptive-use projects intrastate in character. In the proposed plan, these projects would be constructed, operated, and maintained under reclamation law. Water rights would therefore be obtained and administered under the water code of the State in which the project would be built. The participating projects would in general be operated and maintained by the water users after construction. A clear distinction would be maintained between units of the storage project and the participating projects. Should it become necessary at some future time for a State to make consumptive use of a portion of the water in one of the regulatory reservoirs of the storage project, the compact provides for such a contingency.

Repayment schedule: The plan requires payments against irrigation costs by the irrigators up to their ability to repay in 50 years, and the formation of appropriate districts preferably of the water conservancy type which would, through an ad valorem tax or other revenues, assure local participation to the greatest extent in the repayment of construction costs prior to the irrigator's acceptance of assistance from power revenues. The cost of power features of the project would be repaid with interest to the United States Treasury at the going rate for long-term marketable securities on the unpaid balance by project power revenues within a specified 50-year repayment period for individual generating units. The power features recommended by the Secretary could be paid out completely in the first 41 years of operation. Subsequent power revenues would be sufficient to retire the irrigation costs of the storage project prior to the 46th year of operation of the storage project. In addition, power revenues would retire prior to the 50th year of the irrigator's repayment period all irrigation costs in excess of the irrigator's ability to pay for each of the participating projects recommended by the Secretary.

Additional storage project units and participating projects in bill S. 1555: In addition to the Echo Park and Glen Canyon units of the storage project and the 11 participating projects I have covered, S. 1555 as introduced contains the Curecanti and Flaming Gorge units and the Gooseberry, LaPlata, Navaho, and San Juan-Chama participating projects.

Brief descriptions of these proposals are included among the attached statements, but with exception of Gooseberry feasibility reports are incomplete.

Future development: Although the Secretary at this time is recommending only the Echo Park and Glen Canyon storage units and 11 initial participating projects, the plan provides for submission to the Congress from time to time of additional storage project units and additional participating projects. These submissions will be made as the needs for such units and projects arise, and when investigations are complete and feasibility reports are available. Such a procedure, in our opinion, will provide for the greatest possible development of the water and related resources of the upper Colorado River Basin and will offer sufficient flexibility for future changes in economic conditions and Federal budgetary consideration.

Senator WATKINS. Mr. Larson, I suggest, in order to clear up a lot of questions that will be asked, that you proceed now with a statement on these individual participating projects that have been considered. I do not know how long you can stand to read, but I have noted that many times the questions we ask are later answered in the witness' statements.

I personally grow impatient; I want to get the answer right now, but I believe that we will find many of the answers in your statement. If you will proceed to read the additional information, I believe it will help you.

Mr. LARSON. Before I proceed, I should mention that there is attached to my statement, a summary table of Colorado River storage project and participating projects, indicating the lands to be irrigated; the generating capacity of the powerplants; municipal water; stream depletion; total expenditures; nonreimbursable expenditures; the allocations made to power, municipal water, and irrigation; the irrigation allocations repayable by the water users; and the irrigation allocation assigned for repayment from the net revenues of the Colorado storage project.

Senator WATKINS. That will be received and made a part of the record.

(The material referred to follows:)

Summary table—Colorado River storage project and participating projects

Project	State	Land to be irrigated (acres)		Power		Municipal water annually (acre-feet)	Stream depletion annually (acre-feet)	Total (exclusive of nonreimbursable CRDF expenditures)	Non-reimbursable	Construction costs		Irrigation allocation repayable by water users	Irrigation allocation assigned for repayment by net power revenues	
		New	Supplemental	Generating capacity (kw.)	Annual generation (million kw.-hr.)					Reimbursable allocations 2 (exclusive of interest during construction)	Irrigation			
														Power	Municipal water
Colorado River storage project:														
Initial units:														
Echo Park unit.....	Colorado, Utah.....			200,000	1,008		87,000	\$176,426,000		\$128,383,000	\$48,043,000		\$48,043,000	
Glen Canyon unit.....	Arizona, Utah.....			800,000	4,287		526,000	421,270,000		370,974,000	50,296,000		50,296,000	
Subtotal initial units.....				1,000,000	5,245		613,000	597,696,000		499,357,000	98,339,000		98,339,000	
Additional units in the bill:														
Curecanti unit (940,000 acre-feet), Flaming Gorge unit.....	Colorado.....			40,000	225		18,000	49,305,000		41,205,000	8,100,000		8,100,000	
Subtotal additional units.....	Utah, Wyoming.....			72,000	360		56,000	82,942,000		52,042,000	30,900,000		30,900,000	
Subtotal additional units.....				112,000	585		74,000	132,247,000		93,247,000	39,000,000		39,000,000	
11 participating projects:														
La Barge.....	Wyoming.....	7,970					14,200	1,673,300			1,673,300		1,178,300	
Seedskaade.....	do.....	60,720					110,400	23,272,000			23,272,000		18,487,000	
Lyman.....	do.....	40,600					0	10,564,000			10,564,000		8,309,000	
Silt.....	Colorado.....	1,900	5,400				5,800	3,356,000	\$73,600		3,282,400	1,020,000	2,262,400	
Smith Fork.....	do.....	2,270	8,160				7,500	3,367,000	24,000		3,343,000	1,045,000	2,298,000	
Paonia.....	do.....	2,210	14,830				9,000	6,944,000	152,400		6,791,600	2,414,000	4,377,600	
Florida.....	do.....	6,300	12,650				12,900	6,941,500	437,900		6,503,600	1,711,500	4,792,100	
Pine River project extension.....	Colorado, New Mexico.....	15,150					28,300	5,027,000			5,027,000		2,982,000	
Emery County.....	Utah.....	3,630	20,450				15,500	9,865,500	229,000		9,636,500	3,715,500	5,921,500	
Central Utah (initial phase).....	do.....	28,540	131,840		373	48,800	189,400	231,044,000	5,991,000	46,699,000	127,354,000	15,191,000	112,163,000	
Hammond.....	New Mexico.....	3,670					7,900	2,302,000			2,302,000		1,932,000	
Subtotal initial projects.....		132,360	233,930	61,000	373	48,800	400,900	304,356,300	6,907,900	46,699,000	45,500,000	199,749,400	35,046,500	164,702,900

Senator KUCHEL. May I ask a question on that point?

Senator WATKINS. On this exhibit?

Senator KUCHEL. Yes.

Senator WATKINS. Proceed.

Senator KUCHEL. It was this question, so we can understand pretty generally what the bill covers: You state here in your summary table 11 participating projects and 5 additional participating projects in the bill. Then you have also additional units in the bill, Curecanti and Flaming Gorge unit; in addition, that is, to Echo Park and Glen Canyon. Are we to understand, Mr. Larson, that in the present bill to be authorized by Congress are 20 different projects?

Mr. LARSON. No; I do not believe that is correct. May I explain my table, what it is intended to reflect?

Senator KUCHEL. Yes.

Mr. LARSON. There are 20 projects referred to in the bill. Some of them are for conditional authorization.

Senator KUCHEL. For conditional?

Mr. LARSON. Some of them have conditions attached.

Senator KUCHEL. But all, however, are in line with the testimony of the Assistant Secretary of the Interior that this bill authorizes them so far as Congress is concerned, and all that would then remain would be findings by the Department of the Interior; is that not correct?

Mr. LARSON. I think the provisions in the bill speak for themselves. I would not want to interpret them.

Senator ANDERSON. San Juan-Chama project is listed on your list here. But the language in the bill specifically requires that it would have to be approved by Congress. It is particularly in there so that friends of ours in Texas, for example, who are somewhat worried about it, might be reassured about that. I merely want to say that in general I think your statement is correct. Certainly the first four projects that are in the bill would be authorized, except that Curecanti has a conditional authorization to it—in the bill adopted by the House, at least—and it has a conditional authorization in this bill, does it not? I refer you to the language about your Curecanti at the very beginning.

Senator WATKINS. What the bill contains now and what it may contain when we get through with it are probably two different things.

Senator ANDERSON. I merely want to point out, Mr. Chairman, that it says the Curecanti Dam shall be constructed to a height in which it will impound not less than 940,000 acre-feet of water, and so forth. That is a condition on the project; is it not?

It does not mean that it has to come back to Congress, but on the projects that are involved in New Mexico, where there was a controversy, it says they have to come back and be approved by Congress. That is line 10, page 3. So they are a little different from the provisions to which Senator Kuchel referred to a moment ago.

Senator WATKINS. Now if you will proceed with the explanations, I think it will clear up a lot of matters that we want to go through, and then we will go back and give you a workout.

Mr. LARSON. I will begin at the upper end of the basin and come downstream in explaining each of the participating projects.

The LaBarge project in Wyoming includes providing the water supply for 7,970 acres of new land. The principal crops will be hay, pasture, small grain. The farmers have dairy cows and sheep.

Senator ANDERSON. Mr. Chairman, off the record.

(Discussion off the record.)

Senator WATKINS. You may proceed.

Mr. LARSON. Statement of LaBarge project, Wyoming. The potential LaBarge project would make a direct flow diversion from Green River, a principal tributary of the Colorado River, to provide for the irrigation of 7,970 acres of desert lands in Sublette and Lincoln Counties in southwestern Wyoming. Only about 300 acres of these lands receive any irrigation water at the present time. Their meager supply would likely be used on other lands outside the project area if the project was constructed. Water for domestic and stock-watering use on farms in the project area would be taken from project canals and from shallow wells that would be developed by the water users.

Project lands would generally be utilized for the support of livestock enterprises. Climatically adaptable crops, such as hay, small grain, pasture, and some garden crops would be produced. The principal livestock would be dairy cows and sheep. Analyses made indicate that an average farm of about 210 irrigated acres in the project area would provide the farm family with a reasonable standard of living, provide employment for the available family labor, and permit payment of operation, maintenance, and replacement costs and some payment toward construction costs of project facilities.

Detailed land classification surveys show the project lands to be suitable for sustained production of crops under irrigation farming. Water supply studies, based on records of stream flows as they have occurred in the past, indicate that an adequate irrigation supply of 24,300 acre-feet annually would be available for the project from direct flows with permissible shortages in occasional drought years. A water right for the project can be obtained under Wyoming State law.

Construction features of the project would include a main diversion and distribution canal with an initial capacity of 175 second-feet and extending approximately 40 miles along the west side of Green River, a few short laterals, and a few short drains as required. Construction of the main canal and the laterals would require about 2 years. Drains would not be completed until a few years after application of water to the land so that the extent of works required could be determined. A period of 2 to 3 years would be required to construct the project.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the LaBarge project, Wyoming, dated January 1951, a supplement to the Colorado River storage project reported dated December 1950. Results of current (1953) estimates for this project plan are summarized in the attached project summary tabulation.

Senator WATKINS. Now I suggest that we place in the record the summary data of the LaBarge project, Wyoming.

(The material referred to follows):

COLORADO RIVER STORAGE PROJECT

Summary data, LaBarge project, Wyoming

IRRIGATED ACREAGE

New lands, 7,970 acres.

PRINCIPAL AGRICULTURAL PRODUCTION

Hay, pasture, and small grain; dairy cows and sheep.

WATER SUPPLY

	<i>Acre-feet</i>
Average annual increase in direct-flow diversions.....	24,300
Average annual increase in storage yield.....	None
Stream depletion (average annual).....	14,200

PROJECT WORKS

Construction features would include main diversion and distribution canal with initial capacity of 175 second-feet and extending approximately 40 miles along west side of Green River, a few short laterals and a few short drains.

CONSTRUCTION COST AND REPAYMENT

Estimated cost.....	\$1, 673, 300
Reimbursable cost allocated to irrigation.....	1, 673, 300
Nonreimbursable allocation.....	None
Repayment by—	
Irrigation water users.....	\$495, 000
Power revenues from Colorado River storage project.....	1, 178, 300
Total	1, 673, 300
Annual operation, maintenance, and replacement costs.....	14, 700
Benefit-cost ratio.....	2. 12 to 1

Senator WATKINS. I call your attention to the benefit-cost ratio, 2.12 to 1. Probably this would be a good time to let you explain just how you arrived at that benefit-cost ratio. That was the question asked of Mr. Tudor, and I think it would be a good time for us to get this because it will be the same procedure, will it not, for all of these projects. Is that right, Mr. Larson?

Mr. LARSON. Yes, sir. I can give you a brief explanation.

Senator WATKINS. I asked if it would be the same procedure and if you use the same formula to determine the benefit-cost ratio.

Mr. LARSON. Yes; we use the same procedure for all projects. In arriving at the benefit-cost ratio of a project, we must first place the costs on an annual basis. We take the construction cost of the project, add to it the interest during construction and during a 50-year repayment period, and then get the annual equivalent cost, what it would be annually, straight through, for 50 years. That gives you the annual cost.

Then our economists and agriculturalists, who work on the repayment ability, and the payout of the projects determine the net farm income from increased crops and livestock products. Those are direct benefits. They determine, too, the increase in profits to business, increase in processing trade, and other things. They compute the total benefits on an annual basis and compare them with the annual costs.

If the benefits are, say, 1½ times that cost put on an annual basis, then the benefit-cost ratio is 1.5 to 1.

Senator WATKINS. As I understand it, you start out with the actual cost of construction, plus the interest on the money; is that right?

Mr. LARSON. Yes. In the case of the 11 participating projects, it includes the cost of the project, interest both during and after construction, and a pro rata share of the cost of the Colorado storage project units allocated to irrigation.

Senator WATKINS. That is, in the cost?

Mr. LARSON. Yes. If you will remember, in that table for Echo Park and Glen Canyon, we show that 98,339,000 of the cost of those 2 storage units is allocated to irrigation. In our studies for determining the benefit-cost ratio, we include a pro rata share in this cost, in arriving at the annual cost of the participating projects.

Senator WATKINS. What you try to do, when you try to determine the benefit-cost ratio, is determine whether or not the cost of the project based, as you have said, produces something in the end that is worth more than what you spend; is that right?

Mr. LARSON. That is correct.

Senator WATKINS. And you figure that out, as I understand it, based on income from the farm itself.

Mr. LARSON. Yes. It is the net income from increased crop production and livestock.

Senator WATKINS. And then you add to that?

Mr. LARSON. Those are the direct benefits. Then we add the indirect benefits that we can estimate and be reasonably sure of. There are a lot of public benefits and a lot of indirect benefits that we do not include yet we know they do exist.

Senator WATKINS. That is standard procedure in the Bureau of Reclamation, is it not, in measuring these projects as to whether they were worth more than they cost?

Mr. LARSON. Yes. This is the procedure we have been using for some time and are using at the present time.

Senator WATKINS. And that has been recognized by the Congress in passing previous bills authorizing reclamation projects?

Mr. LARSON. Yes. In general, it is the procedure devised by several Government agencies here at the Washington level on costs and benefits.

Senator WATKINS. That includes the Bureau of the Budget and Agriculture and Interior, does it not?

Mr. LARSON. I do not recall just who it includes except the Army engineers and Department of Agriculture. There are 2 or 3 more.

Senator WATKINS. That is generally accepted, is it not, even by the communities in the West, in reclamation areas?

Mr. LARSON. Sir?

Senator WATKINS. I say, that formula has been approved, more or less, by the water users, the power users, industry, and the people generally in areas where these projects are built? I cite you as an illustration of that and as evidence that it is accepted, the fact that the people are ready and willing to organize conservancy districts in which an ad valorem tax is assessed on all of the taxable property within that district to help repay these costs. This is done largely on the theory that there are many indirect benefits that come to the community as a result of our project.

Mr. LARSON. That is correct.

Senator WATKINS. And they have adopted laws of that kind, such as the one operating out in Colorado under the Big Thompson project.

Mr. LARSON. Yes, that project has a conservancy district organization.

Senator WATKINS. And that is true in the Weber Basin project in Utah where one has been just organized?

Mr. LARSON. Yes.

Senator WATKINS. And that project is under construction?

Mr. LARSON. Yes. And one conservancy district is being organized for another project in Colorado, the Collbran project.

Senator WATKINS. In other words, over the years business, industry, and people generally in the communities where reclamation projects have been built, have been receiving large benefits?

Mr. LARSON. Yes, sir.

Senator WATKINS. And they have just recently taken on themselves part of the burden of paying for those benefits. It has all been on the irrigators in the past?

Mr. LARSON. Yes, sir.

Senator WATKINS. That is, in an irrigation project. This formula recognizes the benefits that come to the communities, generally, independent of the water users, and that is one way that ratio is worked out. Then for the country as a whole, some consideration is given, is it not, to what comes to the United States generally?

Mr. LARSON. Yes, sir.

Senator WATKINS. Do you have in mind any project, for instance, in the State of Utah where you could illustrate the benefits that come to the United States, or anywhere else for that matter? It does not matter to me which one you use. I could direct your attention to the Echo project in Utah, which I think is a very good example.

Mr. LARSON. The Weber River project, or Echo project as it is sometimes called, is not to be confused with Echo Park. It is a very good illustration. On that project, in the early days of the pioneers, about 65 percent of the land was used for the growing of grain, and most of the remainder for alfalfa. Today, the area totals about 75,000 acres. Out of that 75,000 acres only about 8 or 10 percent is used for the growing of grain. There are now many very important crops, such as truck crops, and vegetable and fruit crops for canning. For instance, the tomato crop is very large and is canned there. I might say, too, that the total gross crop value of that project, before the construction of the Echo Reservoir, never exceeded about \$1¼ million and most of the time less than that. Since the construction of Echo Reservoir and a full supplemental supply of water made available, the gross crop value of that project has been as high as \$14 million in 1 year, and \$10 million in many years.

Senator WATKINS. Of course, that means increased income taxes paid to the United States.

Mr. LARSON. Several canning factories have been brought in, and there are new businesses of all kinds, and I daresay that increased income tax to the United States as a result of that water is many times the construction payment by the water users.

Senator WATKINS. It has provided for employment of additional men and women? That is a general result, is it not, on a project of that kind?

Mr. LARSON. Yes.

Senator WATKINS. I wanted to make it clear, to bring out through you, what the thinking or philosophy is in back of this benefit-cost ratio, where you have these figures of, for instance, 1.12 to 1, and to find out how it is determined. That question is often asked and I think we have done a good job of clearing it up. There is one additional factor in connection with the use of water on land and under these projects. You mentioned many times a supplemental supply. The people in this room and the Senators here probably know all about that, but there will be many in the Congress and the public generally and some of our writing friends on the newspapers and magazines that do not seem to understand. What do we mean when we say we get a supplemental supply? What does it mean to a farm that is operating just under a line below success?

Mr. LARSON. Many of the projects in the area that we are discussing can raise a variety of crops, we will say, with irrigation totaling 3 or 4 acre-feet annually. The lands in some cases may be short 1 acre-foot, 2 acre-feet, or sometimes more. When lands are short of water, crops must be limited to something like grain or hay, that could be harvested early and do not require later water. A wide variety of crops is not possible without later water.

Furthermore, the yields of alfalfa and grain would not be as great, if only partially irrigated and lacking a full irrigation supply for the entire season. So a supplemental supply might be little or great. It might be as little as a half an acre-foot to the acre or it might go up to 2 acre-feet or some other such figure.

Senator WATKINS. But that additional water makes a success out of the farm that might not otherwise be a success, economically speaking; is that correct?

Mr. LARSON. That is correct. Another point is that the supplemental water supply is nearly always a storage supply.

Senator WATKINS. It is more or less insurance; is it not?

Mr. LARSON. Yes. It is more of an assured supply than a direct diversion which, in dry years, may fall off completely after July 1 or some other date when there is no water at all.

Senator WATKINS. And it presupposes also the fact that the farmer has already a basic primary water right, prior to the bringing in of this additional storage; does it not?

Mr. LARSON. Yes, sir.

Senator WATKINS. And it firms up the water supply so that a farm which may be operating on the margin becomes successful and can actually produce at a profit?

Mr. LARSON. That is correct.

Senator WATKINS. That is the reason why so much of the water that is developed by one of these projects, goes to supplement that which the farmers already have and which is not quite sufficient to make them successful. Is that not the theory back of the whole thing?

Mr. LARSON. That is the theory.

Senator WATKINS. And under those circumstances, farmers can pay a higher rate for water, for supplemental use, than they would be able to pay if they had to buy their whole supply for a farm at this time?

Mr. LARSON. Yes; that is right.

Senator WATKINS. I think that has been worked out time and again in many of the recent projects, not only in Utah, but in many parts of the West; is that not right?

Mr. LARSON. Yes.

Senator WATKINS. Are there any questions of the Senators on this?

Senator ANDERSON. I think that is a very fine statement, Mr. Chairman, both by you and the witness and I appreciate it going into the record. I have just two questions about the project.

You have an operation and maintenance and retirement cost of only \$2 an acre per year. That is a very reasonable cost, is it not, for a project of this nature, even though it is a rather high elevation?

Mr. LARSON. Yes, we think it is. We make quite a study of the operation and maintenance costs of all of the private systems of the area in which we are working, and keep track of the operation costs of our federally constructed projects. We weigh how difficult the canals are, or how simple they are. We go into all of these factors before we make an estimate.

Senator ANDERSON. Two dollar charge per acre per year is certainly not extravagant. Your overall construction cost may be a couple of hundred dollars, but you have charged to irrigation only \$60 an acre. That is a reasonable cost in that type of country; is it not? You could put \$600 an acre against certain lands that we are acquainted with, that have different growing seasons. But in that particular area, with a shorter growing season, \$60 an acre would be a fair charge to put against irrigation, would it not?

Mr. LARSON. I think the charge is more than that on LaBarge.

Senator ANDERSON. The total construction cost on 808,000 acres is \$4,090,000.

Mr. LARSON. The irrigation allocation, divided by the number of acres, I believe, is \$210 per acre.

Senator ANDERSON. Yes, but you are charging part of that to the power revenues, the breadwinners I have been talking about, and the only thing against the farm is \$60, which is all the farmer can possibly have put against him in that altitude with the short growing season; is that correct?

Mr. LARSON. Yes; that is determined to be his ability to pay after paying his operation and maintenance costs.

Senator ANDERSON. I think it illustrates the careful way in which the Bureau of Reclamation goes into these projects and the sensible approach they take to them.

Senator WATKINS. One other question with respect to each of these projects. I assume that your answer will apply to all of them. These projects have been investigated in the field by the engineers, and the feasibility is determined. Soil surveys, and engineering work has been done on the dam sites and all the other facilities, to the point where you know there is a feasible project; is that not a fact?

Mr. LARSON. Yes. For each of the 11 participating projects recommended by the Secretary, there is a detailed authorizing report called a supplemental report to the Colorado storage project on file with your committee and which was submitted to the President through the Bureau of the Budget.

Senator WATKINS. And that report is available to the committee, of course?

Mr. LARSON. Yes. I believe your committee has two copies of each supplemental report.

Senator WATKINS. Not only the committee, but I assume that each member has a copy as well. I think you can proceed, if there are no other questions.

Senator KUCHEL. Mr. Chairman?

Senator WATKINS. Senator Kuchel.

Senator KUCHEL. Mr. Larson, referring to your comments on the legal background, on page 12—

Senator WATKINS. We arrange to have him finish these projects. Some of this may be covered and you may get it without having to ask questions in advance.

Will you proceed with the next project, Mr. Larson, that is covered by this authorization bill? I mean the next unit. I think they ought to be referred to as units of an overall basinwide project. That is actually what they are; are they not?

Mr. LARSON. Yes, they are units, but so they will not be confused with the storage units, they are referred to as participating projects.

Senator WATKINS. Just so we understand the distinction. You are still in Wyoming.

STATEMENT ON THE SEEDSKADEE PROJECT, WYOMING

Mr. LARSON. The potential Seedskadee project would divert water from Green River, a principal tributary of the Colorado River, to provide for the irrigation of 60,720 acres of arable dry lands lying along both sides of the river in Lincoln and Sweetwater Counties in southwestern Wyoming. Of the total area, 51,960 acres would be included in family-sized farm units and 9,030 acres would be used for community pasture.

Water for domestic and stock watering use in the project area would be obtained from project canals and from shallow wells that would be developed by the water users. Fish and wildlife values in the area would probably suffer minor damage as a result of project development. Recreation values would not be materially affected.

With project development, the irrigated lands would be utilized primarily for the support of livestock enterprises, particularly dairy cows and sheep. Climatically adaptable crops, such as grasses for hay and pasture, small grain, alfalfa, and some garden crops would be produced.

Analyses made indicate that an average farm of about 200 irrigated acres in the Seedskadee area would be required to provide the farm family with a reasonable standard of living, provide employment for the available family labor, and permit payment of operation, maintenance, and replacement costs of project facilities and some payment toward construction costs of project facilities.

Detailed land classification surveys shows the project lands to be suitable for sustained production of crops under irrigation farming. Water supply studies based on records of streamflows as they have occurred in the past indicate that an adequate irrigation supply of 225,800 acre-feet annually would be available from direct flows for the project with permissible shortages in occasionally drought years. A water right for the project can be obtained under Wyoming State law.

Principal construction features of the project would include a diversion dam on Green River, a system of main canals and laterals to convey water from the diversion dam and distribute it to project lands, two hydraulic-driven pumps at drops in the distribution canals to lift water to some of the lands, and a few miles of artificial drains.

The Seedskadee diversion dam would consist of a low ogee overflow section 400 feet long, canal headworks, a sluiceway, and a dike 1,000 feet long. The Seedskadee diversion canal would extend along the west side of Green River and would convey water from the river to the project lands. It would be 19 miles in length and would have an initial capacity of 1,350 second-feet. The diversion canal would terminate at a bifurcation structure at the headings of the two main canal distribution systems, one serving lands west of the river and the other serving lands east of the river. Main canals in the distribution system would total about 160 miles in length. A lateral system would be constructed to deliver water from the main canals to individual farm tracts.

A construction period of about 8 years, including the completion of definite plan investigations, would be required to complete all project facilities except the drains. Drains would not be completed until several years after application of water to the lands so that the actual extent of drainings works required could be determined.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the "Seedskadee project, Wyoming" dated November 1950, a supplement to the Colorado River storage project dated December 1950.

Results of current, 1953, Bureau of Reclamation estimates for this project plan are summarized in the attached project summary tabulation. Studies of the upper Green River Basin made subsequent to 1950 indicate that significant modifications in the project plan may be found desirable during the definite planning stage of the investigation.

Senator WATKINS. The summary may be received and made a part of the record.

(The summary referred to is as follows:)

Summary data, Seedskadee project, Wyoming¹

IRRIGATED ACREAGE		<i>Acres</i>
New lands (largely public domain)-----		60, 720
Supplemental-----		None
Total-----		60, 720

¹ Studies in the upper Green River Basin subsequent to 1950 indicate that enlargement of the project area and addition of some storage may be found desirable during the definite plan investigations of the potential project.

PRINCIPAL AGRICULTURAL PRODUCTION

Hay pasture, and small grain, dairy cows and sheep.

WATER SUPPLY		<i>Acres-feet</i>
Increase in average annual direct flow diversions-----		225, 800
Increase in average annual storage yield-----		None
Stream depletion (average annual)-----		110, 400

PROJECT WORKS

Construction features would include a diversion dam on the Green River, a system of main canals and laterals, two hydraulic-driven pumps and a few miles of drains. The diversion canal, 19 miles in length, would have an initial capacity of 1,350 second-feet. Main canals and laterals in the distribution system would total about 160 miles in length.

COST AND REPAYMENT

Estimated cost.....	\$23, 272, 000
Reimbursable cost allocated to irrigation.....	23, 272, 000
Nonreimbursable allocation	None
<hr/>	
Repayment by—	
Irrigation water users.....	4, 785, 000
Power revenues from Colorado River storage project.....	18, 487, 000
<hr/>	
Total.....	23, 272, 000
Annual operation, maintenance and replacement costs.....	136, 600
Benefit-cost ratio.....	1.46 to 1

Senator WATKINS. I note that the benefit-cost ratio for that project is 1.46 to 1.

Any questions about this one? If not, we will proceed to the Lyman project.

LYMAN PROJECT, WYOMING

Mr. LARSON. The potential Lyman project is contemplated as a means of improving the late-season irrigation water supply and thus of bettering agricultural production on 40,600 acres of land near the town of Lyman in Bridger Valley, a part of the upper Colorado River Basin in southwestern Wyoming. The lands are now irrigated with only a partial supply.

Because of the semiarid climate in the area, irrigation is necessary for successful crop production. Only grasses for hay and pasture, alfalfa, and some small grains can be produced to any extent as the growth of most other crops is precluded by a short growing season and untimely summer frosts that characterize the high 6,500- to 7,000-foot elevations of the project lands.

Additional late-season irrigation water is needed to increase yields of the forage and grain crops to bolster the all-important local livestock industry. Principal livestock would be dairy cows and beef cattle.

The Lyman project would provide late-season irrigation water through construction of a dam and reservoir with 43,000 acre-feet total capacity at the Bridger site on Willow Creek to store the spring flood flows of Blacks Fork and its tributary, West Fork of Smiths Fork. Surplus flows of these streams, now largely used for excessive irrigation in the spring run-off season, would be conveyed to the reservoirs by two feeder canals, one diverting from each of the streams. The water would be retained in the reservoir until needed and then released to the Willow Creek channel.

Enlargement of a few miles of this channel and construction of three canals to divert from this enlarged channel would provide the necessary facilities along with the existing irrigation systems in the area to effect the distribution of the water to project lands. The existing canal systems would be improved and extended as necessary. Drains would be provided where necessary to improve the removal

of unavoidable waste and excess surface waters on the irrigated lands and to protect the lands from accumulations of harmful salts.

Senator WATKINS. Off the record.

(Discussion off the record.)

Senator WATKINS. We are going to put into the record your statements that you have prepared on each of these projects. The one you have not finished is the Lyman project, Wyoming. Before I pass on to the next one, is there anything that you want to say in addition about this Lyman project?

(The statement is as follows:)

LYMAN PROJECT, WYOMING

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Preliminary land-classification surveys indicate that project lands would be suitable for sustained irrigation farming although detailed surveys will be necessary to firmly establish their suitability. Some presently irrigated lands that may be found to be nonarable could be abandoned and their water supply transferred to readily accessible arable lands now idle.

Water-supply studies, based on records and estimates of streamflows as they have occurred in the past, indicate the project would increase the irrigation supply from storage by an average of 32,500 acre-feet annually and reduce the present average irrigation shortage of 37 percent to an average of 12 percent. A water right for the project can be obtained for the project as planned under Wyoming State law provided the necessary agreements and adjustments in water rights can be negotiated with holders of prior natural flow rights in the project area.

A period of 5 or 6 years would be required to complete definite plan investigations and construction of the project facilities excepting the drains. The drains would not be completed until a few years after operation of the project and the actual extent of drainage required could be determined.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the Lyman project, Wyoming, dated October 1950, a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) Bureau of Reclamation estimates for this project plan are summarized in the attached project summary tabulation.

Summary data, Lyman project, Wyoming

IRRIGATED ACREAGE

	<i>Acres</i>
New lands -----	None
Supplemental-----	40,600
Total -----	40,600

PRINCIPAL AGRICULTURAL PRODUCTION

Hay, pasture and small grain—dairy cows and beef cattle.

WATER SUPPLY

	<i>Acres-feet</i>
Average annual increase in direct flow diversion-----	0
Average annual increase in storage yield-----	32,500
Stream depletion-----	None

PROJECT WORKS

Construction features would include the Bridger Dam and Reservoir with total of 43,000 acre-feet capacity, enlargement of the Willow Creek channel, construction of three canals and some drainage facilities.

CONSTRUCTION COST AND REPAYMENT

Estimated cost-----	\$10,564,000
Reimbursable cost allocated to irrigation-----	10,564,000
Nonreimbursable allocation-----	None
<hr/>	
Repayment by:	
Irrigation water users-----	2,255,000
Power revenues from Colorado River storage project-----	8,309,000
Total -----	10,564,000
<hr/>	
Annual operation, maintenance, and replacement costs-----	45,900
Benefit-cost ratio-----	1.01 to 1

Mr. LARSON. There is one thing I would like to say.

Senator WATKINS. We will not require you to read them now.

Mr. LARSON. There is one thing I would like to say in addition that pertains to many of these projects. Where I refer to the principal crops being hay, pasture, and small grain, and the stock being dairy cows, beef cattle and sheep, that will be true also of a number of projects in the other States, particularly in Colorado. What I would like to emphasize is the importance of more hay and pasture and grain in these mountainous areas, where it is such an advantage to create a better balance between the farm lands and the vast range lands.

Senator WATKINS. As a matter of fact, the rangelands would not be worth very much if you did not have a farm to go with it on which you could produce the supplemental feed for winter.

Mr. LARSON. That is correct. The range people cannot afford to ship hay and grain long distances to carry their cattle and sheep over the winter. It is very important to raise more hay and grain, so as to make better use of the millions of acres of rangelands that we have in the upper Colorado River area.

Senator WATKINS. And as I have indicated, probably the rangelands would not be worth very much, unless we did have these lands on which to grow the additional supplemental food supply for these animals.

Mr. LARSON. That is correct.

Senator ANDERSON. On this one, you get into a favorable benefit ratio by a pretty slim whisker, do you not? It is 1.01 to 1. If it had been a closer horse race than that, it would have been tough, would it not?

Mr. LARSON. You are correct, Senator Anderson, but I would like to make this comment, that some of the projects such as this one we feel confident that in preparing a definite plan report and by making more detailed studies for it, we should improve the benefit-cost ratio as it should not be that close.

Many of these plans we can improve in the detailed preconstruction surveys.

Senator ANDERSON. This is all supplemental water, is it?

Mr. LARSON. Yes, sir. There are some new lands in that area that might be added after further study, but it will take a definite plan report to cover that.

Senator ANDERSON. The assessment for supplemental water would be about \$55 an acre, even taking into consideration the \$8 million that would come from the power revenues of the dam.

Mr. LARSON. Yes, sir; I would like to say, Senator Anderson, that the benefit-cost ratio for the Lyman was much more favorable when we submitted the report on it in 1950, and when we brought these costs up to date in 1953, our present-day costs, that change cut the benefit-cost ratio materially down.

Senator WATKINS. Costs have increased since the time you first made your estimate.

Mr. LARSON. Yes. The costs in general have increased from 12 to 14 percent over the estimates we made in the 1950 report, as shown in the reports I am submitting today.

Senator ANDERSON. This is about a 7,000-foot elevation and this land will be used mostly for pasture?

Mr. LARSON. That area now is used for hay and grain, with a short water supply. The dairying up there is one of the main industries. The farmers ship the milk out in refrigerated tank trucks to cities. They have a large number of dairy cows in that area.

Senator WATKINS. That will be made a part of the record. Unless you have some special statement for the rest of them, we will put into the record the statements on the Eden project, Wyoming; a statement on the Silt project, Colorado; on Smith Fork project, Colorado; a statement on Paonia project, Colorado; Florida project, Colorado; Pine River extension, Colorado-New Mexico; Emery County project, Utah; central Utah project, Utah.

That is a rather large one. Have you any comments you want to add to that one? As I understand, later there will be testimony given by a qualified engineer on this project specifically, when the Utah people present their statements.

Mr. LARSON. We have a summary statement here for the central Utah which is about as brief as it can be written for such a large project.

Senator WATKINS. I have one here. Is that a copy of the one you have?

Mr. LARSON. Yes; that is it.

Senator WATKINS. This is the one we are placing in the record.

Inasmuch as George (Dean) Clyde is going to present that, we will not do anything more than just put that in evidence now.

Hammond project, New Mexico; Navaho project, New Mexico; San Juan Chama project, Colorado and New Mexico; LaPlata project, Colorado-New Mexico; Gooseberry project, Utah.

I think that covers them.

(The above-referred to statements are as follows:)

STATEMENT ON EDEN PROJECT, WYOMING

When completed, the Eden project in southwestern Wyoming will divert water from the Big and Little Sandy Creeks in the upper Colorado River Basin to irrigate 10,660 acres of arable lands not now irrigated and will replace or otherwise rehabilitate the major features of the irrigation system that heretofore was utilized to irrigate 9,540 acres.

Climatically adapted crops in the area such as alfalfa, pasture grasses, and small grains will be produced on the project lands largely in conjunction with livestock operations centered around dairy cows, beef, and farm flocks of sheep and of chickens.

Construction of the Eden project was originally approved by the President on September 18, 1940, as a water-conservation and utilization project under the act of August 11, 1939 (53 Stat. 1418). Work on the project was about 16 percent completed when stopped by order of the War Production Board in December 1942. Completion of the project was subsequently authorized by act of June 28, 1949 (Public Law 132, 81st Cong., 1st sess.). Construction of the project under the latter authorization is now well advanced, with two major features of the project already completed and work currently under way on some of the other project features. The latter act provided for "such modification in the physical features as the Secretary of the Interior may find will result in greater engineering and economic feasibility: *Provided*, That of the construction costs of the irrigation features of the project not less than \$1,500,000 for the project of twenty thousand irrigable acres, or a proportionate part thereof based on the actual irrigable area as determined and announced by the Secretary of the Interior upon completion of the project, shall be reimbursed by the water users in not to exceed sixty years * * * : *Provided further*, That construction costs of the irrigation features of the project which are not hereby made reimbursable by the water users shall be set aside in a special account against which net revenues derived from the sale of power generated at the hydroelectric plants of the Colorado River storage project in the upper basin shall be charged when such plants are constructed."

The current plan of the project is covered in a definite plan report prepared by the Bureau of Reclamation and dated May 1953. Construction features of the project include:

Big Sandy Dam and dikes (now completed) on Big Sandy Creek to form Big Sandy Reservoir of 39,700 acre-feet total storage capacity.

Means Canal (now completed) to convey water from Big Sandy Reservoir to the west side lateral and to the existing Eden Canal.

West side lateral to serve lands on the west side of Big Sandy Creek.

Eden Creek enlargement and relocation below the terminus of the Means Canal to serve lands east of Big Sandy Creek.

Little Sandy Canal rehabilitation and extension to connect with the upper section of the Eden Canal.

Enlargement of existing lateral system served by Eden Canal to serve both presently irrigated and new lands under that canal.

Project drainage system.

A detailed classification survey shows the lands of the project to be suitable for sustained-crop production under irrigation farming.

Water-supply studies, based on records of streamflows as they have occurred in the past, indicate that an adequate irrigation supply would be available for the project area from direct flows and storage with permissible shortages in occasional drought years.

Project construction costs based on January 1953 prices are currently estimated at \$7,287,000. The project repayment was established by the project authorizing act of June 28, 1949, as \$1,500,000, to be repaid over 60 years. This amount deducted from total project costs leaves \$5,787,000 to be repaid from Colorado River storage project net power revenues under the general repayment

plan of the latter project and in accordance with the Eden project authorizing act of 1949.

Data on the project are summarized in the attached tabulation.

Summary data, Eden project, Wyoming

IRRIGATED ACREAGE	
New land.....	10, 000
Supplemental.....	9, 540
Total.....	20, 200

PRINCIPAL AGRICULTURAL PRODUCTION

Hay, pasture—dairy cows, sheep, beef.

WATER SUPPLY	
	<i>Acres-feet</i>
Increase in average annual direct flow diversions.....	39, 600
Increase in average annual storage yield.....	20, 400
Total.....	60, 000
Stream depletion (average annual).....	32, 400

PROJECT WORKS

Construction features include the Big Sandy Dam, dikes, and reservoir with 39,700 acre-feet total storage capacity (now completed), Means Canal (now completed) laterals and improvements in existing distribution system, along with drainage to serve the project area.

CONSTRUCTION COSTS AND REPAYMENT	
Estimated cost.....	\$7, 287, 000
Reimbursable cost allocated to irrigation.....	7, 287, 000
Nonreimbursable cost.....	None
Repayment by:	
Irrigation ¹	1, 500, 000
Power revenues from Colorado River storage project.....	5, 787, 000
Total.....	7, 287, 000
Annual operation, maintenance, and replacement costs.....	40, 400
Benefit-cost ratio.....	1.3-1

¹ Based on 60-year repayment period as provided under Project Authorizing Act of 1949.

STATEMENT ON SILT PROJECT, COLORADO

The potential Silt project would provide for the full irrigation of 1,900 acres of new land and provide supplemental water to 5,400 acres of partially irrigated land, all in the vicinity of Rifle and Silt, communities in Garfield County of west-central Colorado. The lands are situated in three compact blocks north of the Colorado River between Rifle and Elk Creeks, tributaries of the Colorado River. The project would also provide some enhancement in fish and wildlife values in the area.

The basic type of agriculture in the area would remain unchanged with project development because of climatic and soil conditions. With late season water provided by the project, however, the plantings of row crops would be increased somewhat as would the yield of livestock feeds. Alfalfa, small grains, sugar beets, and potatoes would continue to be the principal crops grown. Principal livestock would be dairy cows, beef cattle, and sheep.

Principal construction features include the Rifle Gap Dam and Reservoir of 10,000 acre-feet total capacity on Rifle Creek, a small hydraulic turbine and direct-connected pump at the dam, reconstruction of one presently abandoned ditch, rehabilitation of the existing Grass Valley Canal and construction of some laterals and drains. Except for minor drainage work, about 3 years would be

required for construction of project features, including the completion of definite plan investigations.

Preliminary land classification surveys indicate that the lands would be suitable for sustained crop production under irrigation farming. A detailed classification of the presently unirrigated lands would be required to confirm the degree of their suitability.

Water supply studies based on records of streamflows as they have occurred in the past indicate that an adequate irrigation supply would be available for the project from direct flows and storage yield with permissible shortages in occasional drought years. A water right for the project can be obtained under Colorado State law.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the "Silt project, Colorado," dated January 1951—a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) Bureau of Reclamation estimates for this project plan are summarized in the attached project summary tabulation.

Summary data, silt project, Colo.

IRRIGATED ACREAGE		<i>Acres</i>
New lands.....	-----	1, 900
Supplemental.....	-----	5, 400
Total.....	-----	7, 300

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grain, sugarbeets, potatoes, dairy cows, beef cattle, and sheep.

WATER SUPPLY		<i>Acres-feet</i>
Average annual increase in direct flow diversion.....	-----	4, 200
Average annual increase in storage yield.....	-----	5, 900
Total.....	-----	10, 100
Stream depletion (average annual).....	-----	5, 800

PROJECT WORKS

Principal construction features include the Rifle Gap Dam and Reservoir with 10,000 acre-feet total capacity, a small hydraulic turbine and direct-connected pump, reconstruction of abandoned ditch, rehabilitation of an existing canal, and construction of some laterals and drains.

CONSTRUCTION COST AND REPAYMENT	
Estimated cost.....	\$3, 356, 000
Reimbursable cost allocated to irrigation.....	3, 282, 400
Nonreimbursable cost allocated to fish and wildlife.....	73, 600
Repayment by:	
Irrigation water users.....	1, 020, 000
Power revenues from Colorado River storage project.....	2, 262, 400
Total.....	3, 282, 400
Annual operation, maintenance, and replacement costs.....	8, 400
Benefit-cost ratio.....	1.71 to 1

STATEMENT ON SMITH FORK PROJECT, COLORADO

The potential Smith Fork project in west central Colorado would regulate surplus flows of Iron Creek and the Smith Fork of the Gunnison River, a tributary of the upper Colorado River, to increase the irrigation supply for 8,160 acres of land now partially irrigated and provide a new supply for 2,270 acres now unirrigated.

Although an improved irrigation supply would permit new lands to be cultivated and result in better crop yields on presently irrigated lands, the cropping program is largely controlled by climatic, soil, and topographic conditions. Most of the acreage would continue to be utilized for the production of livestock feeds with hay, small grains, and pasture predominating. Increased feed production in the area would result mostly in increased dairy cows, with some increase also in beef cattle, hogs, and poultry.

Detailed land classification surveys show the project lands to be suitable for sustained production of crops under irrigation farming.

Water-supply studies, based on records of stream flows as they have occurred in the past, indicate that an adequate irrigation supply would be available for the project from direct flows and storage water with permissible shortages in occasional drought years. A water right for the project can be obtained under Colorado State law.

Construction features of the project include a storage dam and reservoir with 14,000 acre-feet total capacity at the Crawford site on Iron Creek, the Smith Fork diversion dam, the 2.7-mile long Smith Fork feeder canal of 100 second-feet, to divert from Smith Fork to Crawford Reservoir, the 6.6-mile Aspen Canal of 145 second-feet initial capacity to convey water from Crawford Reservoir to part of the project lands and feed existing ditches and 4 small lateral canals. Existing irrigation facilities in the area would be utilized as fully as practicable. A period of 3 to 4 years would be required to complete definite-plan investigations and construct the project works.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the Smith Fork project, Colorado—a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) Bureau of Reclamation estimates for this project plan are summarized in the attached project summary tabulation.

Summary data, Smith Fork project, Colo.

IRRIGATION ACREAGE

	<i>Acres</i>
New lands.....	2, 270
Supplemental.....	8, 160
Total.....	10, 430

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, pasture, and grain, dairy cows and beef.

WATER SUPPLY

	<i>Acres-feet</i>
Average annual increase from direct flow diversions and storage.....	13, 650
Stream depletion (average annual).....	7, 500

PROJECT WORKS

The construction features include the Crawford dam and reservoir, with 14,000 acre-feet of total capacity, Smith Fork diversion dam, the 2.7-mile long Smith Fork feeder canal of 100 second-feet, 6.6-mile long Aspen Canal of 145 second-feet and 4 small lateral canals.

CONSTRUCTION COST AND REPAYMENT

Estimated cost.....	\$3, 367, 000
Reimbursable cost allocated to irrigation.....	3, 343, 000
Nonreimbursable cost allocated to recreation.....	24, 000
Repayment by:	
Irrigation water users.....	1, 045, 000
Power revenues from Colorado River storage project.....	2, 298, 000
Total.....	3, 343, 000
Annual operation, maintenance, and replacement costs.....	8, 400
Benefit-cost ratio.....	1. 27 to 1

STATEMENT ON PAONIA PROJECT, COLORADO

The potential Paonia project would divert water from the North Fork of the Gunnison River in the upper Colorado River Basin to improve the irrigation water supply, and thus the agricultural production, of 17,040 acres of land in west-central Colorado. Of these lands, 14,830 acres are presently irrigated and 2,210 acres are arable but not now irrigated. Fish and wildlife values in the area would be enhanced and flood damages would be decreased.

The general type of farming now practiced in the area would be continued with project development but the additional irrigation supplies would make possible a more intensive crop production. Production of livestock foods and fruit, such as apples, peaches, and cherries, would continue to be the major crops grown. Principal livestock would be dairy cows and beef cattle.

Under the project plan, the Spring Creek Dam and Reservoir would be constructed at a site on Muddy Creek, 1 mile above its junction with the North Fork River. The reservoir would have a capacity of 18,000 acre-feet, of which 11,000 acre-feet would be active and 7,000 acre-feet would be reserved for sediment retention and dead storage. The existing Fire Mountain Canal diverting from the North Fork River 5 miles below the Spring Creek Dam would be enlarged and extended. The enlarged canal would be capable of diverting an increased amount of natural streamflow during the early irrigation season and in the late season its supply would be supplemented by water released from the reservoir. In this manner the irrigation water supply for lands under the Fire Mountain Canal would be improved and through its extension the canal would also serve lands on Rogers Mesa that heretofore have been irrigated from Leroux Creek, a tributary of the North Fork River. The Leroux Creek water thus released from Rogers Mesa would be diverted into the higher Overland Canal, which would be improved and enlarged for this purpose, and used to augment the present irrigation supply for lands on Redlands Mesa. Beginning at a point on the Fire Mountain Canal 9 miles below its head, the Minnesota siphon would be constructed to convey part of the water southward 12,000 feet across the North Fork River to the existing Minnesota Canal.

Water-supply studies based on records of streamflows as they have occurred in the past indicate that with project development the irrigation supply for project lands would be increased by 18,500 acre-feet annually from direct flows and storage yield. The increase in stream depletion attributable to the development is estimated at an average of 9,000 acre-feet annually.

Land-classification surveys indicate that the lands would be suitable for sustained crop production under irrigation farming. Some further detailed classification would be required to confirm the suitability of all the lands, particularly in the Leroux Creek and Minnesota areas.

The project, exclusive of the Minnesota unit, was authorized, under a modification of the above-described plan, by act of Congress on June 25, 1947. Enlargement and extension of the Fire Mountain Canal has been essentially completed under this authorization. Reauthorization of the project, under the revised plan described above, was recommended in the Bureau of Reclamation report on the Paonia project, Colorado, dated February 1951, a supplement to the Colorado River storage project report dated December 1950.

Results of current (1953) Bureau of Reclamation estimates for the physical plan of the project as covered in the Paonia project report of February 1951, are summarized in the attached project summary tabulation.

Summary data, Paonia project, Colorado

IRRIGATED ACREAGE		<i>Acres</i>
New lands.....	-----	2, 210
Supplemental.....	-----	14, 830
Total.....	-----	17, 040

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grain, apples, peaches, dairy cows, and beef cattle.

WATER SUPPLY

	<i>Acre-feet</i>
Average annual increase in direct flow diversions.....	7,500
Average annual increase in storage yield.....	11,000
Total	18,500
Stream depletion (average annual).....	9,000

PROJECT WORKS

The construction features include the Spring Creek Dam and Reservoir with 18,000 acre-feet total capacity, enlargement and extension of the Fire Mountain and Overland Canals and the Minnesota siphon. The enlargement and extension of the Fire Mountain Canal is essentially completed under prior project authorization.

CONSTRUCTION COST AND REPAYMENT

Estimated cost.....	\$6,944,000
Reimbursable cost allocated to irrigation.....	6,791,600
Nonreimbursable cost allocated to—	
Flood control.....	\$74,100
Fish and wildlife.....	70,800
Recreation.....	7,500
Total	152,400
Repayment by:	
Irrigation water users ¹	2,414,000
Power revenues from Colorado River storage project.....	4,377,600
Total	6,791,600
Annual operation, maintenance, and replacement costs.....	11,100
Benefit-cost ratio.....	1.6 to 1

¹ Based on 68-year repayment period as provided under project authorizing act of 1947.

STATEMENT ON FLORIDA PROJECT, COLORADO

The potential Florida project is planned primarily to supply irrigation water to, and thus increase the agricultural production on, 18,950 acres of Florida Mesa and Florida River Valley lands in the upper Colorado River Basin in southwestern Colorado. The lands include 12,650 acres presently irrigated with only a partial supply and 6,300 acres presently not irrigated. Approximately 1,000 acres of the land, including 100 acres partially irrigated and 900 acres now unirrigated, are owned by Indians. In addition to irrigation values, the project would provide some enhancement in fish and wildlife values in the area and effect some decrease in flood damages along Florida River.

With project development, the irrigated lands would be utilized largely for the support of livestock enterprises as now practiced in the area. Climatically adaptable crops, such as small grains, alfalfa, hay, pasture, and some pinto beans, potatoes, apples, vegetables, and berries, would be produced. Analyses made indicate that a family-size farm would provide the farm family with a reasonable standard of living, provide employment for the available labor, and permit payment of operation, maintenance, and replacement costs of project facilities and some payment toward the construction costs of project facilities.

Preliminary land classification surveys indicate that project lands would be suitable for sustained production of crops under irrigation farming. Detailed land classification would be required to confirm the suitability of all the lands.

Water-supply studies based on records of streamflows as they have occurred in the past indicate that an adequate irrigation supply would be available for

the project with permissible shortages in occasional drought years. The increase in irrigation supply would average 23,200 acre-feet annually including 6,900 acre-feet of direct flows and 16,300 acre-feet of storage water. Water rights for the project could be obtained under Colorado State law.

Construction features of the project would include the Lemon Dam and Reservoir with a total capacity of 23,300 acre-feet to store water on Florida River, construction of a new diversion dam on Florida River at the head of the existing Florida Farmers ditch, enlargement and extension of the existing Florida Farmers ditch diverting from Florida River, and some distribution and drainage facilities. Water would be released from the reservoir as needed and conveyed in the natural river channel to heads of various downstream canals and ditches that would divert the flow for distribution to project lands. A 3- to 4-year period would be required to complete construction of the project.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the "Florida project, Colorado" dated January 1951, a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) Bureau of Reclamation estimates for this project plan are summarized in the attached project summary tabulation.

Summary data, Florida project, Colorado

IRRIGATED ACREAGE

	Indian	Non-Indian	Total
New	900	5,400	6,300
Supplemental	100	12,550	12,650
Total	1,000	17,950	18,950

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grains, dairy cows, and beef.

WATER SUPPLY

	<i>Acre-feet</i>
Average annual increase in direct-flow diversions	6,900
Average annual increase in storage yield	16,300
Total	23,200
Stream depletion (annual average)	12,900

PROJECT WORKS

Construction features include Lemon Dam and Reservoir with a total capacity of 23,300 acre-feet, a diversion dam on Florida River, enlargement and extension of existing Florida Farmers ditch, and some distribution laterals and drains.

CONSTRUCTION COSTS AND REPAYMENT

Estimated cost	\$6,941,500
Reimbursable allocation to irrigation	6,503,600
Nonreimbursable allocation to:	
Fish and wildlife	\$208,700
Flood control	229,200
Total	437,900
Repayment by:	
Irrigation:	
Non-Indian lands	\$1,585,500
Indian lands	126,000
Total	1,711,500
Power revenues from Colorado River storage project	4,792,100
Total	6,503,600
Annual operation, maintenance, and replacement costs	12,600
Benefit-cost ratio	1.4 to 1

STATEMENT ON PINE RIVER PROJECT EXTENSION, COLORADO AND NEW MEXICO

The potential Pine River project extension would provide distribution canals to deliver water made available by the existing Pine River project to irrigate 15,150 acres of land now unirrigated in southwestern Colorado and northwestern New Mexico. Of this acreage 1,940 acres are within the boundaries of the existing Pine River Indian irrigation project.

The Pine River project, consisting of Vallecito Dam and Reservoir of 126,280 acre-feet active capacity on Pine River, was authorized for construction in 1937 to provide storage water for 69,000 acres and was substantially completed and placed in operation by the Bureau of Reclamation in 1941. About half of the lands to be served were under canals and partially irrigated at the time of construction and now receive supplemental water from Vallecito Reservoir. The remaining lands had no distribution facilities at the time of construction. Facilities for these lands were not included as part of the original project as it was thought that the works required were relatively minor and could be undertaken by the water users with private capital. The required works proved so costly, however, that they have not been privately constructed. As a result, canal systems for the lands than can be economically developed at the present time are planned for Federal construction as the Pine River project extension.

With development of the extension the irrigated lands would be utilized largely for the support of livestock enterprises as now practiced in the general locality. Major crops that would be produced on the extension lands are hay and small grains with some potatoes, pinto beans, and early maturing vegetables, and berries also grown. Principal livestock would be dairy cows and beef cattle.

The project extension would consist of the enlargement and extension of 8 major canals and ditches diverting from Pine River, the construction of 1 new diversion dam on Pine River, and the construction of a number of small distribution laterals. Over half the extension lands would be served by enlargement and extension of the existing King consolidated canal and construction of a new diversion dam at the head of this canal. The other canals and ditches to be enlarged and extended include the Pine River Canal and the Myers-Asher, Bennet and Myers, Bear Creek and Pine River, Sullivan, Shroder extension, and Thompson Epperson ditches. A period of 3 to 4 years would be required to complete definite plan investigations and construction of the extension works.

Preliminary land-classification surveys indicate the extension lands to be suitable for sustained crop production under irrigation farming. A detailed classification is necessary to confirm the suitability of all the lands.

Water supply studies, based on records of streamflows as they have occurred in the past, indicate that an adequate water supply would be available for the development from direct flows and storage water from the existing Vallecito Reservoir. A water right for the project can be obtained under Colorado and New Mexico State laws.

This statement is based on the physical plan of development presented in the report on "Pine River project extension, Colorado and New Mexico," dated January 1951—a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) Bureau of Reclamation estimates for this development plan are summarized in the attached project summary tabulation.

Summary data, Pine River project extension, Colorado-New Mexico

IRRIGATED ACREAGE			
	Colorado	New Mexico	Total
New lands:			
Indian	1,940		1,940
Non-Indian	12,580	630	13,210
Total	14,520	630	15,150

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grains; dairy cows and beef.

WATER SUPPLY

	<i>Acre-feet</i>
Average annual increase in direct flow diversions.....	31,550
Average annual increase in storage yield.....	13,900
Total	¹ 45,450

¹ Return flow of 4,250 acre-feet would also be diverted making a total diversion of water by extension lands of 49,700 acre-feet.

Storage at existing Vallecito Reservoir of 126,280 acre-feet active capacity of which some 20 to 25 percent of such capacity would be available to the Pine River project extension lands.

Stream depletion (average annual) :

	<i>Acre-feet</i>
Colorado.....	27,200
New Mexico.....	1,100
Total	28,300

PROJECT WORKS

New construction features include enlargement and extension of eight canals and ditches, a diversion dam, and a number of distribution laterals.

CONSTRUCTION COST AND REPAYMENT

Estimated cost.....	\$5,027,000
Reimbursable allocation to irrigation.....	5,027,000
Nonreimbursable cost allocation.....	None
Repayment by:	
Irrigation:	
Indian lands.....	262,000
Non-Indian lands.....	1,783,000
Subtotal	2,045,000
Power revenues from Colorado River storage project.....	2,982,000
Total	5,027,000
Annual operation, maintenance, and replacement costs	18,950
Benefit-cost ratio	2.2 to 1

STATEMENT ON EMERY COUNTY PROJECT, UTAH

The potential Emery County project is planned primarily to improve the irrigation water supply and thus better the agricultural production of 24,080 acres of land in Emery County in east central Utah near the towns of Huntington, Castle Dale, and Orangeville. The project is in the Green River Basin, a part of the upper Colorado River Basin.

The general type of farming now practiced in the area would be continued with project development. Agriculture would continue to center around the livestock industry with more than 90 percent of the irrigated area producing hay and grains. The increased production in livestock feed would permit increased production on the farm of beef, sheep, pork, and dairy products.

Principal construction features of the project would be Joes Valley Dam and Reservoir, with a total capacity of 57,000 acre-feet, to store water on Cottonwood Creek; the Swasey diversion dam on Cottonwood Creek, 10 miles downstream from Joes Valley; and the 17-mile Cottonwood Creek-Huntington Canal, with an initial capacity of 250 second-feet, heading at the Swasey diversion dam. Some canal laterals and drains would be constructed. Existing irrigation facili-

ties in the area would be utilized as fully as practicable. Recreational facilities would be provided at the Joes Valley Reservoir. A construction period of 3 to 5 years, including completion of definite plan investigations, would be required to complete construction of the project.

The project would make available an average of 31,400 acre-feet of water annually for 24,080 acres of land in Emery County, including 20,450 acres now irrigated with only a partial supply and 3,630 acres not now irrigated. In addition, about 1,000 acre-feet of late-season water annually would be made available by exchange for transmountain diversion to lands in the Bonneville Basin now partially irrigated by the Ephraim and Spring City divisions of the existing Sanpete project. Recreational and scenic attractions at Joes Valley Reservoir site would be developed as planned by the National Park Service.

A preliminary land-classification survey indicates that the project lands would be suitable for sustained production of crops under irrigation farming. A detailed classification would be necessary to confirm the suitability of the lands.

Water-supply studies, based on records of streamflows as they have occurred in the past, indicate that an adequate irrigation supply would be available for the project with permissible shortages in occasional drought years. Water rights for the project can be obtained under Utah State law.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the Emery County project, Utah, dated February 1951, a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) Bureau of Reclamation estimates for this project plan are summarized in the attached project summary tabulation.

Summary data, Emery County project, Utah

IRRIGATED ACREAGE	
New land.....	3, 630
Supplemental.....	20, 450
Total.....	24, 080

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grain, peaches, vegetables; dairy cows, beef cattle, and sheep.

WATER SUPPLY		<i>Acres-feet</i>
Average annual increase in direct-flow diversions.....	3, 900	
Average annual increase in storage yield.....	28, 500	
Total.....	32, 400	
Stream depletion (average annual).....	15, 500	

PROJECT WORKS

Joes Valley Dam and Reservoir, with a total capacity of 57,000 acre-feet, a diversion dam, the 17-mile Cottonwood Creek-Huntington Canal with 250 second-foot initial capacity, and some canal laterals and drains are the principal construction features.

CONSTRUCTION COST AND REPAYMENT	
Estimated cost.....	\$9, 865, 500
Reimbursable cost allocated to irrigation.....	9, 636, 500
Nonreimbursable cost allocated to recreation.....	229, 000
Repayment by:	
Irrigation water users.....	3, 715, 000
Power revenues from Colorado River storage project.....	5, 921, 500
Total.....	9, 636, 500

CONSTRUCTION COST AND REPAYMENT—continued

Annual operation, maintenance, and replacement costs:	
Irrigation-----	21, 870
Recreation-----	15, 110
Total-----	36, 980
Benefit-cost ratio-----	1.38 to 1

STATEMENT ON CENTRAL UTAH PROJECT, UTAH

The potential central Utah project would provide for the multiple-purpose use in Utah of water tributary to the Colorado River. Under the general plan of development, streams draining the southern slope of the Uinta Mountains in the Uinta Basin in northeastern Utah would be intercepted and conveyed westerly by gravity flow through the Wasatch Mountains to the Bonneville Basin. The water would be collected by an aqueduct leading to a storage reservoir high in the Wasatch Mountains. From the reservoir the water would drop through a series of hydroelectric powerplants before being used for irrigation, municipal, and industrial purposes. Replacement water and water for additional development in the Uinta Basin would be provided by a major diversion from the Green River and by smaller developments on local streams.

The project would serve an area along the eastern border of the Bonneville Basin. This area, the most highly developed region in Utah, includes the communities of Salt Lake City, Provo, Heber, Spanish Fork, Payson, Nephi, Richfield, Delta, and Fillmore. The flow of small local streams, practically the only source of water, falls far short of irrigation requirements.

In contrast to the Bonneville Basin, the Uinta Basin has abundant water resources as compared with the land resources. Streams flowing south from the Uinta Mountains—the Duchesne River and its major tributaries, together with Ashley Creek and Brush Creek—produce more than ample water for irrigation.

The project is of such magnitude it has been planned in two parts—the initial phase, a unified portion that could be developed and operate independently, and the ultimate phase. The two phases combined make up the comprehensive plan. Detailed investigations have been made only on the initial phase.

INITIAL PHASE OF PROJECT

In the initial phase of the project only Rock Creek and Uinta Mountain streams west of Rock Creek would be diverted into the Bonneville Basin where development would be limited to areas between Salt Lake City and Nephi. Initial phase development in the Uinta Basin would include the Jensen, Vernal, Upalco, and Duchesne River areas.

The initial phase of the project would provide for the irrigation of 28,540 acres of new land and 131,800 acres now irrigated but in need of more water. Full seasonal regulation would be provided for 42,600 acres of land in the Duchesne River area, more than half of which is owned by Indians or has been acquired from them; 48,800 acre-feet of water would be provided annually for municipal, industrial, and other miscellaneous uses. Powerplants with an installed capacity of 61,000 kilowatts would generate approximately 373 million kilowatt-hours of electric energy annually. Approximately 2.2 million kilowatt-hours of energy would be required by the project for irrigation and drainage pumping. Central Utah project powerplants would be interconnected with plants of the Colorado River storage project.

Preliminary land classification surveys of the project lands indicate that they would be suitable for sustained crop production under irrigation farming.

The potential Strawberry aqueduct would intercept flows of Rock Creek, Hades Creek, Wolf Creek, West Fork of the Duchesne River, Currant Creek, Layout Creek, and Water Hollow. Reservoirs to regulate inflow to the aqueduct would be provided on Rock Creek (upper Stillwater), West Fork of the Duchesne River (Vat) and Currant Creek (Currant Creek).

The existing Strawberry Reservoir, terminus of the Strawberry aqueduct, would be enlarged through construction of the Soldier Creek Dam.

The existing outlet tunnel from the Strawberry Reservoir would be enlarged. Below the tunnel outlet would be constructed the Old West powerplant, sixth

water aqueduct, Hammock powerplant, Tanner powerplant, Monks Hollow Dam, the Wasatch aqueduct as far as York Ridge near Santaquin, and the Castilla powerplant. The Mona-Nephi Canal would be constructed from York Ridge to Salt Creek near Nephi. The Mona Reservoir would be enlarged, the Elberta service pipeline and the existing Elberta Canal would be enlarged to distribute water from Mona Reservoir.

Use of Provo River water through exchange would require Bates Dam on Provo River, Hobble Creek Dam on Little Hobble Creek, the West Valley Canal, and the Front Dam. Provo Bay would be diiked and drained and the upper 7 miles of the Jordan River Channel would be enlarged.

An exchange of water between the Bates Reservoir and numerous small storage reservoirs on the upper Provo River would be made to provide supplemental water to areas in the vicinity of Francis and Heber City. The Wallsburg area would be served by a similar exchange in Hobble Creek Reservoir. A dam would be constructed creating Round Knoll Lake for recreational and fish and wildlife purposes.

New project works to provide water for replacement and expanded irrigation and municipal use in the Uinta Basin would include Hanna Reservoir on the North Fork of Duchesne River, Starvation Reservoir on Strawberry River with a feeder canal from the Duchesne River, the Upalco Reservoir offstream from Lake Fork River, the Stanaker Reservoir with a feeder canal from Ashley Creek, and the Tyzack Reservoir on Brush Creek.

Construction of some new distribution laterals and drains would be required where existing facilities are not adequate to serve the area and where new lands are developed.

Necessary distribution and treatment facilities for municipal, and industrial water within the communities would be constructed and financed by local interests.

Transmission lines for delivery of project power would be constructed to Salt Lake City on the north and to Manti on the south.

Facilities would be constructed for development of fish and wildlife, recreation, and forest resources in general as recommended.

Features would be constructed in an orderly sequence, and as water became available irrigation development would be undertaken at different times in 13 areas or blocks extending over a 13-year period, municipal and industrial water would be supplied in 3 different areas with construction extending over a 7-year period, and construction of the 4 hydroelectric plants would require 8 years before reaching full production.

The operation of various existing facilities would require modification for correlation with the construction and operation of works planned for the central Utah project. Among the principal features in the Bonneville Basin affected would be the Strawberry Reservoir outlet tunnel, canals, and powerplants of the Strawberry Valley project; Deer Creek Reservoir, Provo Reservoir Canal, and Salt Lake aqueduct of the Provo River project; Utah Lake; and Mona Reservoir. Principal facilities in the Uinta Basin similarly affected would include Strawberry Reservoir of the Strawberry Valley project, Moon Lake and Midview Reservoirs and canals of the Moon Lake project, works of the Uinta Indian irrigation project, and various other structures on the Duchesne River, Ashley Creek, and Brush Creek systems. There would be a minor effect on some public and private power facilities in both basins.

This statement on the central Utah project, except as otherwise noted in the following paragraphs, is based on the physical plan of development presented in the Bureau of Reclamation report on central Utah project, Utah, dated February 1951—a supplement to the Colorado River storage project report dated December 1950. Significant modifications may be found in the project plan during the definite planning stage of the investigation.

Since preparation of the 1951 report the communities in eastern Duchesne County have constructed a municipal water pipeline, and this feature would, therefore, be excluded from the project. As a result of eliminating the pipeline, about 2,300 acre-feet of Upalco Reservoir water is considered as a supplemental supply to 2,300 additional acres of land in the Upalco area. A refinement of the water supply studies for lands in the Duchesne River area—Indian and white owned—shows that 4,070 acres of "white lands" formerly considered as receiving replacement water would receive supplemental water instead. Allowances for these revisions in plan are incorporated in the results of current estimates as shown on page 6.

Summary data, central Utah project initial phase, Utah

IRRIGATED ACREAGE

New land-----	28, 540
Supplemental-----	131, 840
Total-----	160, 380

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grain, fruit, vegetables, sugar beets, tomatoes; dairy cows, beef cattle, and sheep.

WATER SUPPLY

Average annual increase in supply (acre-feet) :

Purpose	Uinta Basin	Bonneville Basin	Total
Irrigation:			
Direct flow-----		None-----	
Return flow and salvage-----		31, 500-----	
Storage yield-----		97, 500-----	
Subtotal-----	¹ 46, 200	129, 000	175, 000
Municipal and industrial:			
Direct flow-----		None-----	
Storage-----		44, 300-----	
Subtotal-----	¹ 4, 500	44, 300	48, 800
Project summary:			
Direct flow-----		None-----	
Return flow and salvage-----		31, 500-----	
Storage yield-----		141, 800-----	
Total-----	¹ 50, 700	173, 300	224, 000
Stream depletion (Colorado River)-----	47, 600	141, 800	189, 400

¹ Water supplied by direct flow and storage.

PROJECT WORKS

The principal project features would include construction of the 36.8-mile-long Strawberry aqueduct along the south slope of the Uinta Mountains intercepting Uinta Basin streams as far east as Rock Creek, enlargement of the Strawberry Reservoir through construction of the Soldier Creek Dam, an enlargement of the Strawberry Reservoir tunnel, 4 powerplants with a combined generating capacity of 61,000 kilowatts, numerous reservoirs including 5 with capacities over 30,000 acre-feet:

	<i>Acre-feet total capacity</i>
Starvation Reservoir-----	160, 000
Upper Stillwater Reservoir-----	31, 500
Strawberry Reservoir-----	1, 370, 000
Stanaker Reservoir-----	37, 000
Bates Reservoir-----	65, 000

Aqueducts (including the 28.4-mile-long Wasatch), and canals and distribution systems as necessary to deliver and utilize the increased water supply. Drainage would be provided when necessary.

CONSTRUCTION COSTS AND REPAYMENT—INITIAL PHASE

Estimated cost.....		\$231, 044, 000
Reimbursable cost allocated to:		
Irrigation.....	\$127, 354, 000	
Power.....	46, 699, 000	
Municipal and industrial water.....	45, 500, 000	
Ultimate development.....	5, 500, 000	
Total.....		225, 053, 000
Nonreimbursable cost allocated to:		
Flood control.....	\$3, 113, 000	
Recreation.....	2, 830, 000	
Forest resource development.....	48, 000	
Total.....		5, 991, 000
Repayment of reimbursable costs by:		
Irrigation costs:		
From water users.....	\$15, 191, 000	
From central Utah project power revenue.....	27, 838, 000	
From Colorado River stor- age project power reve- nues.....	84, 325, 000	
Total.....	\$127, 354, 000	
Power costs from project power reevnues..	46, 699, 000	
Municipal and industrial water costs by users.....	45, 500, 000	
Total repayment.....		219, 553, 000
Annual operation, maintenance, and replacement costs:		
Irrigation.....	\$253, 930	
Power.....	445, 900	
Municipal and industrial water.....	69, 160	
Total.....		768, 900
Benefit-cost ratio.....		1. 23 to 1

¹ Available from net power revenues from central Utah project powerplants over a 17-year period following payment of CUP power costs but prior to the end of the 50-year repayment period on the last irrigation block.

* A 1-mill tax under the Utah Water Conservancy Act could appreciably reduce this amount.

THE COMPREHENSIVE PLAN

When fully developed the Central Utah project would provide a full irrigation water supply for 200,000 acres of new land, a supplemental supply for 239,900 acres now inadequately irrigated, and 48,800 acre-feet of water to meet foreseeable demands for municipal, industrial, and other miscellaneous purposes. Project powerplants would have an installed capacity of 249,000 kilowatts and generate almost 1.2 billion kilowatt-hours of electric energy annually. Additional power potentialities exist and will be evaluated as the investigations progress.

The flow of all important streams on the south slope of the Uinta Mountains would be intercepted by the potential 110-mile aqueduct and conveyed to the Strawberry Reservoir. The flow of Carter Creek on the Uintas' northern slope would be brought to the southern slope. The western 36.8 miles of the aqueduct, extending from Rock Creek to the Strawberry Reservoir, would consist of two parallel bores.

Water would be released from the Strawberry Reservoir to the Bonneville Basin through two tunnels. In its 12-mile descent to the Bonneville Basin floor, a drop of about 2,600 feet, the water, including the water of the existing Strawberry Valley project, would pass through a series of hydroelectric powerplants, and then would be divided, part continuing to the south and part being diverted to the north.

During the irrigation season the water continuing south would be distributed for irrigation and other purposes in areas as far south as Fillmore. During the nonirrigation season water used through the powerplants and continuing south would be stored in the Dyer Reservoir for irrigation of the lands in the vicinity of Fillmore. Water of the Sevier River could be stored in existing reservoirs by exchange and used for irrigation of lands along the upper reaches of the river, principally near Richfield and on the lower reaches near Delta.

Water diverted during the irrigation season to the north would be used for irrigation and other purposes in the area from Santaquin to Springville, now partially served by the Strawberry Valley project. During the nonirrigation season releases would flow down Spanish Fork River to Utah Lake replacing Provo River water stored in the potential Bates Reservoir on the Provo River and the potential Hobble Creek Reservoir, a tributary. Project water stored in Bates and Wallsburg Reservoir would be used for irrigation, municipal, and industrial purposes in the Heber-Francis-Wallsburg areas and in the Provo-Salt Lake City region as well as the western part of the Jordan River Valley.

Where practicable the project reservoirs would impound water for recreational and fish and wildlife purposes, thus providing partial compensation for damages to these purposes.

A dike would be constructed across the mouth of Provo Bay, an arm of Utah Lake, and the bay drained, reducing evaporation losses and reclaiming 9,340 acres of land. The diking of Goshen Bay of Utah Lake, authorized as a part of the Provo River project but not yet undertaken, would permit the south 28,000 acres of Utah Lake to be drained, reducing the average annual evaporation by 80,000 acre-feet.

A 7-mile section of the Jordan River channel between Utah Lake and Jordan Narrows would be enlarged. The channel improvement was authorized as a part of the Provo River project. Improvement of the river channel from Jordan Narrows to Great Salt Lake is being investigated by the Corps of Engineers.

In order to replace water now used in the Uinta Basin that would be exported and to provide additional water for further development within this basin, water would be diverted from the Flaming Gorge Reservoir that would be constructed on the Green River as a feature of the Colorado River storage project. Under an alternative plan of development Green River water could be supplied to the Uinta Basin from Echo Park Reservoir, another potential feature of the Colorado River storage project and would be pumped an average lift of 170 feet.

Project powerplants and transmission systems would be interconnected with the system proposed for transmission of electric energy produced by plants of the Colorado River storage project.

Rights to flows of Uinta Basin streams have been acquired by both white settlers and Indians. The Central Utah project would largely control the Uinta Basin's surplus waters. Much of the water would be exported, but that needed for further development in the Uinta Basin would be provided directly from the Green River.

Annual depletions to the Colorado River at the sites of use are expected to average 800,600 acre-feet, or one-half of the water available to Utah under the terms of the upper Colorado River Basin compact.

HAMMOND PROJECT, NEW MEXICO

The potential Hammond project would divert waters of San Juan River to provide an irrigation supply for 3,670 acres of arable land now unirrigated. The lands lie along the south side of the river in a narrow 20-mile strip opposite the towns of Blanco, Bloomfield, and Farmington, in northwestern New Mexico.

The principal crops that would be grown on the lands with project development would be alfalfa, apples, corn, beans, and barley. Most of the farms are of the fruit-crop and dairy-field crop types.

Preliminary land-classification surveys indicate that the lands would be suitable for sustained crop production under irrigation farming. A detailed classification would be necessary to confirm the suitability of all the lands.

Water-supply studies, based on records of streamflows as they have occurred in the past, indicate that an adequate irrigation supply of 18,400 acre-feet annually would be available for the project from direct flows with permissible shortages occurring in occasional drought years. A water right for the project can be obtained under New Mexico State law.

Project works would include the Hammond diversion dam on San Juan River, a 28-mile main gravity canal, a hydraulic turbine-driven pumping plant, the east high-line lateral, the west high-line lateral, minor distribution ditches, and a drainage system. A period of about 2 or 3 years would be required to complete definite plan investigations and construction of project works except the drains. A few years' operation of the project would be necessary to determine the extent of drainage actually required.

This statement is based on the physical plan of project development presented in the Bureau of Reclamation report on the Hammond project, New Mexico dated November 1950, a supplement to the Colorado River storage project report dated December 1950. Results of current (1953) estimates for this project plan are summarized in the attached project summary tabulation.

Studies of the potential nearby Navaho project subsequent to 1950 indicate that it might be found desirable to materially modify the plan for serving the Hammond project lands during the definite plan investigations.

Summary data, Hammond project, New Mexico

IRRIGATED ACREAGE

New land—3,670 acres.

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grains, beans, some fruit—dairy cows and sheep.

WATER SUPPLY

	<i>Acres-feet</i>
Average annual increase in direct flow diversion.....	18, 400
Average annual increase in storage yield.....	None
Stream depletion (average annual).....	7, 900

PROJECT WORKS

Construction features include Hammond diversion dam on San Juan River, a 28-mile 86-second-foot main gravity canal, a small hydraulic turbine-driven pump, distribution laterals, and drains.

CONSTRUCTION COST AND REPAYMENT

Estimated cost.....	\$2, 302, 000
Reimbursable allocation to irrigation.....	2, 302, 000
Nonreimbursable allocation.....	None
Repayment by:	
Irrigation water users.....	370, 000
Power revenues from Colorado River storage project.....	1, 932, 000
Total.....	2, 302, 000
Annual operation and maintenance and replacement costs.....	16, 100
Benefit-cost ratio.....	2.8 to 1

NAVAHO PROJECT, NEW MEXICO

The potential Navaho project (formerly called the Shiprock and south San Juan projects) would provide for the irrigation of about 151,000 acres of arable dry lands lying along the south side of San Juan River, a principal tributary of Colorado River, near the towns of Bloomfield, Farmington, and Shiprock in northwestern New Mexico. Of the lands that would be irrigated 122,000 acres are located in the Navaho Indian Reservation and 29,000 acres are outside the reservation. All the lands within the reservation and some of the project lands outside the reservation are Indian owned. Remaining lands outside the reservation are publicly owned or privately owned by non-Indians.

The general plan of the project includes the Navaho Dam and Reservoir on San Juan River and a main highline canal to divert from the reservoir at a point near the dam and at an elevation well above the stream bed. This main highline canal would divert the water to a point about 28 miles downstream from Navaho Dam where the water would be dropped through a direct connected

turbine pumping plant to a lower main canal that would extend westerly about 60 miles to serve the major portion of the project lands by gravity. The dropping water would energize the pump to lift a part of the water to serve the portion of the project lands inside and outside of the reservation that are too high to be served by the gravity diversion. A distribution system would extend beyond the pump lift to deliver the pumped water to the high lands. A system of drains would be provided as required to prevent seepage of project lands. A certain balance between the various canal elevations and the acreages to be served by gravity and by pumping is necessary in properly planning and designing the project.

Planning investigations of the Navaho project are in progress and are being carried on jointly by the Bureau of Indian Affairs and region 4 of the Bureau of Reclamation. The project is an integral part of the Indian Affairs program to bring relief to the Navaho Indians from their very low family incomes and to make them self-sustaining.

The active storage capacity required for the Navaho project at Navaho Reservoir is dependent on the scale of development of the potential San Juan-Chama project. The latter project is a potential transmountain diversion to the Rio Grande Basin from the headwaters of San Juan River. This diversion project is being investigated by region 5 of the Bureau of Reclamation. Coordination of the Navaho and San Juan-Chama project investigations are being made by the two regions of the Bureau of Reclamation and the Bureau of Indian Affairs in cooperation with the State of New Mexico.

Navaho project lands range from about 5,200 to 6,100 feet in elevation and have a semiarid to arid climate with an average frost-free season of about 150 to 160 days. Annual precipitation averages less than 9 inches with about half occurring during the growing season, making irrigation necessary for successful crop production. With irrigation, climatic conditions are favorable for growing most field crops, a variety of garden crops, and such fruits as apples, pears, peaches, cherries, and apricots. Most of the project acreage would be utilized for production of livestock feeds, with smaller acreages being utilized for fruit and garden crops. Principal livestock would be dairy cows and sheep.

The 151,000-acre project would require an average annual irrigation diversion of about 630,000 acre-feet. Permissible shortages in meeting this requirement would occur in occasional drought years under project operation. The average annual stream depletion that would result from the development would be about 341,000 acre-feet.

Preliminary estimates to date indicate that the total construction cost of the 151,000-acre Navaho project would be about \$232,650,000 exclusive of added storage replacement costs at Navaho Reservoir that would be required with upstream diversions to the San Juan-Chama project. Essentially all of the construction cost would be allocable to irrigation. Annual operation, maintenance, and replacement costs would approximate \$563,000 and would be allocable to irrigation. Preliminary studies also indicate that the farm income would be sufficient for project water users, after meeting operation, maintenance, and replacement costs and maintaining a reasonable standard of living to repay about 8 percent of the construction cost without interest in 50 years after delivery of water and following a suitable farm development period. This would leave about \$213,210,000 of the construction cost to be met from net power revenues of the Colorado River storage project under the general repayment plan of that project. The payment capacity of the Indian-owned land, estimated on the basis of being equal to that of the land under non-Indian farming, would be subject to elimination or adjustment under an extension of the Leavitt Act of July 1, 1932 (47 Stat. 564), authorizing the Secretary of the Interior to adjust reimbursable debts of Indians.

The estimates to date indicate a project benefit-cost ratio approximating 1.2 to 1.

A construction period of about 15 years would be required for efficiently completing definite plan investigations and construction of the project excepting the completion of drains. The desirable construction period, however, would be affected by the actual rate of land settlement as the construction progresses. A development period of 5 to 10 years would be desirable following delivery of water to the various land tracts before making assessments for construction costs.

Data on the project are summarized in the attached tabulation.

Summary of reconnaissance data, Navaho project, New Mexico (details of plan are in process of formulation)

IRRIGATED ACREAGE

	Navaho Indian Reservation	Nonreservation	Total
New land, total	122,000	29,000	151,000
Gravity	104,000	3,000	107,000
Pump (hydraulic)	18,000	26,000	44,000

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grains, pastures, beans, some fruit and vegetables, dairy cows, sheep.

WATER SUPPLY

	<i>Acres-feet</i>
Average annual increase in storage and direct flow diversions	630,000
Stream depletion (average annual)	341,000

PROJECT WORKS

Construction features would include Navaho Dam and Reservoir on San Juan River, with approximately 1,300,000 acre-feet total capacity (500,000 acre-feet active), a 28-mile main highline canal to divert from reservoir about 275 feet above stream bed at dam, a drop from highline canal to a lower main gravity canal extending about 60 miles from the drop, a turbine-driven pump at the drop to lift water to about 30 percent of project lands, a main canal extending from pump lift, distribution laterals, and drains.

CONSTRUCTION COSTS AND REPAYMENT

Estimated cost	¹ \$232,650,000
Reimbursable cost allocated to irrigation	232,650,000
Repayment by—	
Irrigation water users	² 19,440,000
Power revenues from Colorado River storage project	213,210,000
Total	232,650,000
Annual operation, maintenance, and replacement costs	563,000
Benefit-cost ratio	1.2 to 1

¹ Includes approximately \$37,825,000 for capacities in Navaho Reservoir and main highline canal for pump lands and \$18 million cost for pumping plant, distribution system, and drains to serve pump lands. Excludes approximately \$9 million cost of additional Navaho Reservoir capacity required to permit upstream diversion averaging 235,000 acre-feet annually to potential San Juan-Chama project.

² Based on assumption that Indian lands could repay at about same rate per acre as non-Indian-owned lands, or that such costs would be deferred under the provisions of the Levitt Act of July 1, 1932 (47 Stat. 564).

SAN JUAN-CHAMA PROJECT, COLORADO AND NEW MEXICO

The San Juan-Chama project would divert water from the headwaters of San Juan River, a principal tributary of the Colorado River, into the Rio Grande Basin for the purposes of providing supplemental water for existing irrigation projects and of providing water for municipal and industrial uses and for development of hydroelectric power. Although water for diversion would be collected from tributaries of the San Juan located in both Colorado and New Mexico, all of the water would be used in New Mexico in the Rio Grande Basin. By exchange the project would also increase the use of water in New Mexico in the Canadian River Basin. The present plan provides for the diversion of 235,000 acre-feet of Colorado River Basin water annually out of the total amount allocated to New Mexico under the provisions of the upper Colorado River Basin compact.

With project development, an adequate supply of excellent quality water would be available to satisfy the rapidly growing municipal and industrial requirements of the cities and towns in the middle Rio Grande Valley area. In addition water would be available to supplement the now deficient supply to over 200,000 acres of irrigated land in the area. Hydroelectric power would be developed to aid in supplying electrical energy for the development of the resources in the basin. The plants would be designed and operated primarily to meet peak loads and to permit efficient operation of an integrated fuel and hydro power system. In addition the project would provide an opportunity for further development of recreation, fish and wildlife facilities in the center of one of the more important tourist and recreational areas of the country.

Construction features of the project are described under the following three subparagraphs:

1. *Collection and diversion element.*—Three reservoirs having a total capacity of 190,000 acre-feet located on the West Fork, East Fork, and Rio Blanco tributaries of the San Juan River. A feeder canal and conduit system to collect and transport the water to the head of Willow Creek in the Rio Grande Basin. The conduit system would be about 48 miles in length and would have a terminal capacity at the outlet of the tunnel through the Continental Divide of 1,000 cubic feet per second.

2. *Regulation and power production element.*—Three reservoirs would be constructed on Willow Creek and the Rio Chama which, when integrated with the existing El Vado Reservoir and the authorized Chamita Reservoir, would provide facilities needed to regulate water releases for irrigation and municipal and industrial uses and for generation of hydroelectric power. Power development would comprise the installation of 145,000 kilowatt of plant capacity of which 95,000 would be utilized for peaking power and 50,000 for base power. The capacities of the 3 new reservoirs would be 228,000, 400,000, and 40,000 acre-feet. This capacity would be supplemented by the existing 198,000 acre-feet of capacity at El Vado and an additional 85,000 acre-feet planned to be provided in connection with construction of a multiple-purpose reservoir at a site toward the lower end of the Rio Chama as part of the authorized middle Rio Grande project.

3. *Water-use element.*—Construction features for irrigation purposes would comprise regulatory reservoirs, rehabilitation of distribution systems, and some relocation and extension of canals and laterals on existing irrigation projects on Rio Grande tributaries. Water for these projects would be made available by operation under exchange agreements. The present plan does not include construction features for delivery of municipal and industrial water to the cities and towns beyond the reservoirs on the Rio Chama. Such features could be added later as part of the project if the local interests desire Federal construction and financing.

Construction of project features would be accomplished over a period of about 15 years including the installation of all power units.

This statement is based on the physical plan presented in Bureau of Reclamation's interim report on the San Juan-Chama project dated March 1952. The financial data and analysis of the project was revised in December 1953 to conform to current policy and procedure. Project investigations to date are of reconnaissance degree of detail and the construction costs used, which are based on December 1951 prices, were prepared sufficiently conservative as to require no readjustment for the small change in construction prices since that date. Results of the reconnaissance estimates, along with other project data, are summarized in the attached project summary tabulation.

Summary Data, San Juan-Chama project, Colorado and New Mexico

IRRIGATED ACREAGE	
New land.....	None
Supplemental	Over 200, 000
Total	Over 200, 000

WATER SUPPLY

Average annual increase in diversion of 235,000 acre-feet from storage and direct flow from Colorado River :

	<i>Acre-feet</i>
Irrigation -----	113, 900
Municipal and industrial -----	110, 100
Power -----	11, 000

Stream depletion (average annual from Colorado River Basin) -- 235, 000

CONSTRUCTION COSTS AND REPAYMENT

Estimated cost -----	¹ \$228, 141, 000
Reimbursable cost allocated to—	
Irrigation -----	99, 308, 000
Power -----	73, 459, 000
Municipal and industrial water -----	55, 374, 000
Total -----	228, 141, 000
Nonreimbursable cost -----	None
Repayment by—	
Irrigation costs	
Irrigation water users -----	32, 335, 000
Power revenues ² -----	66, 973, 000
Total -----	99, 308, 000
Power costs -----	² 73, 459, 000
Municipal and industrial water -----	² 55, 374, 000
Total -----	228, 141, 000
Operation, maintenance, and replacement costs :	
Irrigation -----	306, 000
Power -----	852, 000
Municipal and industrial water -----	114, 000
Total -----	1, 272, 000
Benefit-cost ratio -----	1.6 to 1

¹ Exclusive of replacement storage costs required for the potential Navaho project in the San Juan River Basin and also exclusive of past expenditures for investigations from nonreimbursable Colorado River development fund.

² From Colorado River storage project and San Juan-Chama project.

³ Interest during construction amounting to \$4,028,000 on municipal and industrial water costs and \$2,396,000 on power costs in addition to the amounts shown would be repaid by the project beneficiaries.

LA PLATA PROJECT, COLORADO-NEW MEXICO

The potential LaPlata project would store and divert waters of the LaPlata River to improve the irrigation water supply, and thus the agricultural production of 9,800 acres of arable lands in southwestern Colorado and northwestern New Mexico now irrigated with an inadequate supply. Of the total area 6,000 acres are in Colorado and 3,800 acres are in New Mexico. The project would also decrease flood damages along the lower stretch of LaPlata River. LaPlata River is a tributary of the San Juan River in the upper Colorado River Basin.

The general type of farming now practiced in the area would be continued with project development. Agriculture would continue to center around the livestock industry with most of the irrigated area producing alfalfa and small grains for livestock feeds. Livestock would be predominantly dairy cows and beef cattle.

Features of the project would include construction of a 12,000 acre-foot reservoir at the offstream Long Hollow site and a reservoir at the State line site on LaPlata River with a normal capacity of 17,000 acre-feet, of which 12,000 acre-feet would be active for water conservation and 5,000 acre-feet would be dead storage, and a surcharge capacity of 15,000 acre-feet for flood control. A 400 second-foot feeder canal would be constructed to divert surplus LaPlata River flows to the Long Hollow Reservoir and a 70 second-foot outlet canal would deliver storage water from Long Hollow Reservoir to existing irrigation canals.

Project water would be distributed to individual farm tracts by existing irrigation systems.

Water supply of storage water studies based on records of streamflows as they have occurred in the past indicate that the project would increase the irrigation supply of storage water at canal headgates by an average of 12,000 acre-feet annually. Water rights could be obtained under Colorado and New Mexico State laws. Under project operation the average annual increase in stream depletion would be about 5,800 acre-feet in Colorado and 3,200 acre-feet in New Mexico.

Preliminary land classification surveys indicate that the project land would be suitable for sustaining crop production under irrigation farming. A detailed classification would be necessary to confirm the suitability of the lands.

Results of preliminary estimates, made at 1953 construction prices, at a projected long-term price level of 180 (1939 equals 100) for operation, maintenance, and replacement costs, and at a price level of 215 (1910-14 equals 100) for benefits and repayment, are summarized in the attached project summary tabulation.

Alternative plans are currently under investigation.

Summary data, LaPlata project, Colorado-New Mexico

(Alternative plans are currently under investigation)

IRRIGATED ACREAGE

Supplemental:	
Colorado.....	6,000
New Mexico.....	3,800
Total.....	9,800

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, grains, dairy cows, and beef.

WATER SUPPLY

	<i>Acre-feet</i>
Average annual increase in direct flow diversion.....	None
Average annual increase in storage yield.....	12,000
Stream depletion (acre-feet annually)	
Colorado.....	5,800
New Mexico.....	3,200
Total.....	9,000

PROJECT WORKS

Construction features include Long Hollow Dam and Reservoir, 12,000 acre-feet total capacity; State Line Dam and Reservoir, 17,000 acre-feet total capacity; a 400 second-foot feeder canal; and a 70 second-foot Long Hollow Reservoir outlet canal. Project water distributed by existing irrigation systems.

CONSTRUCTION COSTS AND REPAYMENT

Estimated cost.....	\$9,958,500
Reimbursable allocation to irrigation.....	9,184,700
Nonreimbursable allocation to flood control.....	773,800
Repayment by—	
Irrigation water users.....	1,245,000
Power revenues from Colorado River storage project.....	7,939,700
Total.....	9,184,700
Annual operation, maintenance and replacement costs.....	14,080
Benefit-cost ratio.....	0.8 to 1

GOOSEBERRY PROJECT, UTAH

The potential Gooseberry project would divert water from a headwater tributary in the Colorado River Basin to improve the irrigation water supply and thus the agricultural production, of 16,400 acres of arable lands in the Bonneville Basin in Sanpete County, central Utah. The project would also enhance recreational values for the population in the general vicinity of the project. A small net loss would probably result in fish and wildlife values. A net benefit to forest resource development would result from relocation of roads in connection with construction of project storage facilities.

The general type of farming now practiced in the area would be continued with project development. Agriculture would continue to center around the livestock industry with more than 95 percent of the irrigated area producing alfalfa, pasture, and small grains for livestock feed. Principal livestock would include dairy cows, beef cattle and sheep.

Under the project plan surplus flows of Gooseberry Creek would be regulated at the 17,200 acre-foot capacity reservoir that would be constructed at the Mammoth site on the creek and would then be conveyed in the potential 2.4-mile Mammoth tunnel through the Colorado-Bonneville Basin Divide to Cottonwood Creek. The water would be diverted from Cottonwood Creek into existing canals and the potential Gooseberry Highline Canal for conveyance to project lands. The water would be distributed to individual farm tracts by existing laterals that would be rehabilitated as necessary as a part of the project development. Usable return flow would be collected in natural channels that would be cleaned and improved as part of the project. Drains would be provided for land with a high water table and the San Pitch River Channel would be improved as necessary to provide an outlet for the drainage system. Boating, camping, and picnicking facilities would be provided at Mammoth Reservoir as recreational features of the project. As part of the reservoir construction, 3 miles of forest roads and sheep corral would be relocated and 2 miles of connecting roads would be constructed. A 3- to 5-year period would be required to complete construction of the project.

Water supply studies based on records of streamflows as they have occurred in the past indicate that with project development the irrigation supply for project lands would be increased by an average of 14,000 acre-feet annually including 11,700 acre-feet of direct diversion of storage water and an increase of 2,300 acre-feet of usable return flows. Water rights for the project can be obtained under Utah State law.

A preliminary land classification survey indicates that the project lands would be suitable for sustained production of crops under irrigation farming. Detailed land classification would be required to confirm the suitability of all the lands.

Results of current (1953) Bureau of Reclamation estimates for the physical plan of the project, as covered in the Gooseberry project report dated January 1953, are summarized in the attached project summary tabulation.

Summary data, Gooseberry project, Utah

IRRIGATED ACREAGE	
New land.....	None
Supplemental.....	16,400
Total.....	<u>16,400</u>

PRINCIPAL AGRICULTURAL PRODUCTION

Alfalfa, pasture, grain, dairy cows, beet cattle, and sheep.

WATER SUPPLY	
Average annual increase in return flow.....	<i>Acres-feet</i> 2,300
Average annual increase in storage yield.....	11,700
Total.....	<u>14,000</u>
Stream depletion.....	12,500

PROJECT WORKS

The construction features would include the Mammoth Dam and Reservoir with a total capacity of 17,200 acre-feet, the 2.4-mile Mammoth tunnel, the Gooseberry Highline Canal, and some rehabilitation of existing canals and laterals.

CONSTRUCTION COST AND REPAYMENT

Estimated cost.....	\$5,760,500
Reimbursable cost allocated to irrigation.....	5,727,500
Nonreimbursable cost allocated to recreation.....	33,000
<hr/>	
Repayment by—	
Irrigation water users.....	2,375,000
Power revenues from Colorado River storage project.....	3,352,500
<hr/>	
Total	5,727,500
<hr/>	
Annual operation, maintenance, and replacement costs :	
Irrigation.....	11,020
Recreation.....	2,540
<hr/>	
Total	13,560
Benefit-cost ratio.....	1.2 to 1

Senator ANDERSON. I certainly wanted to ask a great many questions about the Navaho project and the San Juan-Chama project.

Mr. LARSON. May I make one explanation, Mr. Chairman?

The statement here on the San Juan-Chama project was prepared by region 5 of the Bureau of Reclamation, with headquarters at Amarillo, Tex. In the statement for the Navaho project, that portion covering the south San Juan division was prepared by region 4 of the Bureau of Reclamation, and the remainder, the Shiprock division of the Navaho project, was prepared by the Bureau of Indian Affairs. The Shiprock division is an Indian project, a project for the Navaho Indians. I should mention that there are Indian lands and white lands under the pump canal and Indian and white lands under the gravity canal of the Navaho project. The Bureau of Reclamation has studied the white lands and the Indian Bureau has studied the lands for the Indians, all as described in this statement.

Senator WATKINS. Have you given us all the general statement that you intended to make?

Mr. LARSON. Yes, sir.

Senator WATKINS. I have one question to ask?

Mr. LARSON. That is all I can think of at this time.

Senator WATKINS. I had not noticed anything much on the power development, whether you wanted to go into any detail on that, the power output from these various storage dams. I assume somebody will want to ask you some questions about that. There has been a question raised about the family-size farm. What have you to say about that? You mentioned it several times, the family unit.

Mr. LARSON. Of course, we have the present 160-acre land provision, but in making our economic analyses of projects at these higher elevations, we have recognized the fact that a family-size farm in some cases requires more than 160 acres and we have simply put in our report exactly what we found.

Senator WATKINS. In other words, you have not tried to fit it to any theory at all?

Mr. LARSON. No. Our determinations show 200 acres for the Seed-skadee project and a slightly greater acreage for the La Barge.

Senator ANDERSON. What do you do about the law?

Mr. LARSON. We simply pass our findings on to the President and to the Congress, and I think it is then in the hands of the Congress.

Senator ANDERSON. The 160-acre limitation does not apply if Congress does not do something about it?

Mr. LARSON. I assume it does apply if Congress does not modify it.

Senator ANDERSON. Do you recommend, then, the amendment of the 160-acre limitation?

Mr. LARSON. In this case, our report is in effect a recommendation. We are telling you what we think a family-size farm is.

Senator ANDERSON. It just happens that I have long agreed with you on this 160-acre limitation at high altitudes. I supported a bill that, I believe, Senator Millikin introduced, with reference to an area in Colorado, where it was quite obvious that they needed more than 160 acres. I wanted to make sure that the Bureau of Reclamation was not opposed to the 160-acre limitation.

Mr. LARSON. I am not attempting to speak for the Commissioner, of course. He is here.

Senator WATKINS. Congress has already made a determination on this high-altitude program. We have already allowed an expansion of the 160-acre farm up to a larger acreage in order to take care of the situation that actually exists. You cannot farm on a theory. You have to farm on a practical situation. Those farms have to be operated that way.

In other words, you have to be realistic or we will not have any opportunity to put to use the waters allocated to us in the upper basin States. Is that not right?

Mr. LARSON. Yes, sir.

Senator WATKINS. I think that is one thing we have to keep in mind, and the Congress and the people of the United States have to keep in mind, to make this a realistic program. If it takes a larger farm to make a family unit, that is what we will have to do. And it is up to Congress to make that decision.

Well, I think we can go back now to the general statement made by Mr. Larson. We will start with you, Senator Anderson.

Senator ANDERSON. I want to refer to page 4 of your statement, Mr. Larson, where you refer in the first paragraph to the two units of the storage project, Echo Park and Glen Canyon, with the multiple purpose units. You say one of these, the Shiprock division of the Navaho project, has since been withdrawn. Can you give us the circumstances of that withdrawal?

Mr. LARSON. That withdrawal was by the Secretary, and I think someone from the Secretary's Office should answer that.

Senator ANDERSON. When we were talking about Mr. Tudor a short time ago, he did not have the information, but he said you were here.

Mr. LARSON. I would say, as I have mentioned, that for the 11 participating projects plus Eden, there are detailed authorizing reports for each one. There is not a detailed authorizing report for the Navaho project. The La Plata had an unfavorable benefit-cost ratio and its plan is being revised.

Senator ANDERSON. I have a copy of a document called Project Planning Report No. 4-8a.81-1. It is a report of the Bureau of

Reclamation on Colorado River storage project and participating projects of the upper Colorado River Basin, dated December 1950, put out in Salt Lake City, and I assume from your office. Is that correct?

Mr. LARSON. Yes, sir. I signed that report.

Senator ANDERSON. In that report, there is a schedule in chapter 3, which says the designs and estimates of certain projects are, and then illustrate the ones that have been, I assume, pretty carefully worked over. I just want to read you the headings in there: Cross Mountain unit, Crystal unit, Curecanti unit, Echo Park unit, Flaming Gorge unit, Gray Canyon unit, Navaho unit, Split Mountain unit, Whitewater unit. It seems in 1950, they all stood on about the same footing, did they not?

Mr. LARSON. I can explain that, Senator Anderson. In 1950, the Navaho Reservoir was considered 1 of the 10 for the Colorado storage project, that is 1 of the 10 Colorado storage project units. The site was drilled and a cost estimate prepared in conjunction with the Chief Engineer's Office, and a very good estimate prepared. Then later the reservoir was found necessary for the individual irrigation projects in New Mexico.

Of course, the cost estimate is still good. But, there were not comparable detailed estimates on the canal for the south San Juan division and the Shiprock division of the Navaho project.

Senator ANDERSON. Therefore, the Navaho Reservoir is as far along as the Echo Park, Flaming Gorge, or any of those, is it not?

Mr. LARSON. Yes, sir.

Senator ANDERSON. So that if we decide we wanted to authorize the Navaho Dam, that could be authorized without any difficulty, could it not?

Mr. LARSON. As far as preliminary engineering is concerned, yes. We have drilled the dam site and made an estimate.

Senator ANDERSON. That is what I wanted to get. As far as preliminary engineering is concerned, it is just as far along as any of the others. As a matter of fact, the Navaho unit is shown at page 40 of the 1950 report, and there's a great deal of information about it. It indicates, as I said this morning, and I am glad to find out that my memory was correct, that the dam was to rise 335 feet above the stream bed, by means of a cutoff trench to the extent of 25 additional feet in bedrock. So you have done work, you have drilled it, so far as I know, nobody has ever challenged the correctness of the work being done, is that true?

Mr. LARSON. There is one difference in Echo Park and Glen Canyon with respect to the Navaho Reservoir. The capacity there is used for the benefits of all States, whereas the Navaho Reservoir will be for individual uses in New Mexico, the costs must be allocated against whatever projects use it. That, of course, has not finally been done yet, and will not be until the detailed reports are available.

Senator ANDERSON. In many of the projects, and we have just gone through them today, project after project, \$2 million would be assessed against the project, and \$8 million more would come from the general revenues. So this project would be no different than any other. The cost of the Navaho Dam could be maybe \$50 million, and some of that would have to be assessed against the general revenues coming from the big breadwinners, and then in addition there would be money

coming from the Navaho project and from the development of the irrigated lands.

I hope my questions did not sound as if I were critical at all of the work the Bureau of Reclamation has done, or the Indian service has done or what has been done by the Amarillo office. I think all of these offices have done a fine work and we can do nothing but commend them for the good work they have done. I was trying to point out that in 1950 the Navaho Dam seemed to be as far along as some of these other dams, and studies had been made. I was trying to get the answer that I was happy to get from you, that if the Navaho Dam is included there is sufficient work on the dam itself, so that construction could proceed on that.

Now, as to the rest of the project, would you be the person to testify, or should the Indian Irrigation Service testify as to the so-called Shiprock part?

Mr. LARSON. I would like to make one brief explanation and then the Shiprock division, if that is what you are interested in, should be explained by the engineer for the Bureau of Indian Affairs. I would like to just clear up one point.

The Navaho project consists of the Navaho Reservoir on the San Juan River, and then a main canal leading down on the south side of the river for many miles, until it comes to the irrigable lands of the south San Juan project. Below that point, the lands at a higher elevation would be covered by a pump canal, and the main canal would go on and cover the gravity lands.

In other words, if you will turn to the summary statement, out of the 151,000 of new lands, 122,000 acres are Navaho Indian Reservation lands and 29,000 are nonreservation lands. Out of the 122,000 acres of Navaho lands, 104,000 acres would be under the gravity canal and 18,000 acres would be under the hydraulic pump on the south San Juan division. Out of the 29,000 acres of nonreservation lands, 3,000 acres would be under the gravity canal and 26,000 acres would be under the hydraulic pump.

I just wanted to clear up that point. And one thing further, the Bureau of Indian Affairs and Bureau of Reclamation makes—

Senator ANDERSON. You are talking now about the things that would be beyond the dam, the takeoffs from the reservoir. But I would like to take it step by step, if we might. I am concerned first with the dam itself, the reservoir that is going to be constructed there. Then, from that, there will come a canal. I do not know whether it is going to carry 175 second-feet or what it is going to carry, but it is going to be a large canal. It is going to get to a certain point where there may have to be a lift. Those are secondary steps. The third step beyond that is how much of the Indian land and white land in the Shiprock project we are going to put under cultivation. The Indian people can discuss that.

But I did hope that we might recognize that the dam itself and the reservoir that is to be up there, could be constructed with the work that was done on the original surveys, and the drillings that were made and the engineering studies that were made.

Mr. LARSON. I think I made the point clear that we have drilled the site and have the detailed estimate.

Senator ANDERSON. Yes, you did, and I appreciate the fact that you have drilled the site and made the detailed estimate.

Now, the second step, how far are we along with the canal?

Mr. LARSON. The Bureau of Indian Affairs and the Bureau of Reclamation have been working very closely together. The Bureau of Reclamation, region 4, has agreed to do the work on the detailed estimate on the main canal down to the pumping plant. Then the Bureau of Reclamation, region 4, is making the estimate of the pumping plant and the pump canal. The Bureau of Indian Affairs is taking the project from there on and they are preparing what might be termed a detailed project report. We will furnish them a writeup on the south San Juan division.

Senator ANDERSON. How far along is region 4 with the study of the canal?

Mr. LARSON. I believe that can best be described by Mr. Keesee, the area engineer. He is handling the details of the work and working very closely with our agency. He is here and can explain that better than I.

Senator WATKINS. Would you come forward while we are talking about that, Mr. Keesee?

For the record, please give your name and address.

STATEMENT OF G. B. KEESSEE, CHIEF OF THE BRANCH OF IRRIGATION FOR THE NAVAHO RESERVATION, GALLUP, N. MEX.

Mr. KEESSEE. My name is G. B. Keesee. I am the Chief of the Branch of Irrigation for the Navaho Reservation located at Gallup, N. Mex.

Senator ANDERSON. It would be a little foolish for me to start out asking if you are familiar with this project, but I think for the record I should ask you anyhow.

Mr. KEESSEE. Yes, I am.

Senator ANDERSON. Very familiar with it?

Mr. KEESSEE. I have been there since October 1950.

Senator ANDERSON. Your headquarters are at Gallup?

Mr. KEESSEE. Yes, sir.

Senator ANDERSON. But you cover the entire area of the Navaho Reservation in your work?

Mr. KEESSEE. That is right.

Senator ANDERSON. Now, Mr. Keesee, it is contemplated that a canal would be built from the dam known as the Navaho Dam, to carry water down toward the Shiprock project. Do you know how far along the studies are on that proposal?

Mr. KEESSEE. The tentative location has been made on paper.

Senator ANDERSON. Is it on the bank of the river?

Mr. KEESSEE. No, it is back from the river, several miles. The canal will have a capacity of about 2,700 second-feet. Unfortunately, I do not have those exact figures with me. I have them at the office, but I do not have them with me here, Senator.

Senator ANDERSON. You have done a considerable amount of work on it?

Mr. KEESSEE. Yes.

Senator WATKINS. Are they available here in Washington?

Mr. KEESSEE. Yes, I have them available at the Indian Service Office.

Senator ANDERSON. Roughly, how long would it take to be ready to build the canal, if authorization was to be given by this Congress?

Mr. KEESEE. I would say approximately 3 years.

Senator ANDERSON. Three years?

Mr. KEESEE. The designs would have to be made, Senator, and the final location would have to be made in the field for the canal. You see, the final plans or designs for the Navaho Dam have not been made. I imagine it would take the chief engineer approximately 2 or 3 years to do that, do you not think so, Mr. Larson?

Mr. LARSON. I do not think it would take 3 years, no.

Mr. KEESEE. What would be your estimate?

Mr. LARSON. It would depend, of course, on what priority it got.

Senator ANDERSON. That is it. If we did not get a priority, of course it would take quite awhile. But you know the general route that the canal will follow, do you not?

Mr. KEESEE. Yes, sir.

Senator ANDERSON. I saw Mr. Keesee in New Mexico just about 10 days ago. I left Farmington early in the morning and flew to Albuquerque, and the man who was piloting the plane thought he knew pretty generally where that canal would go.

It is pretty well known, is it not?

Mr. KEESEE. Yes, it is pretty well known.

Senator ANDERSON. Once you have made the tracings, an ordinary concrete-lined canal, which I assume it would be, would not take too long to construct would it?

Mr. KEESEE. It will be tunnels, siphons, lined sections and open earth sections.

Senator ANDERSON. And you think it might take 2 or 3 years?

Mr. KEESEE. In other words, if we got the priority, for instance, on the Navaho Dam, we have located all of the necessary material for the dam, the top of the dam site has been taken and preliminary designs have been made.

Now, on a priority, with the Chief Engineer of the Bureau of Reclamation to make the design, he might get it out in 6 to 8 months. The canal itself, under the same priority, probably could be handled equally as rapidly. But we have in the neighborhood, as I recall it, close to 30 miles of main canal to build, of which the first section is about 10 miles of tunnel. That would come from the dam site to Largo Canyon.

Senator ANDERSON. You also have in your office a fairly complete study of the Navaho project itself, the Shiprock project, so-called?

Mr. KEESEE. Yes, sir.

Senator ANDERSON. Those studies are fairly complete, are they not, on over 100,000 acres of grounds?

Mr. KEESEE. They cover 129,000. We have a canal located on that on the ground.

Senator ANDERSON. You have a canal located?

Mr. KEESEE. On the ground, yes, sir.

Senator ANDERSON. I am just trying to find out some way of asking whether or not the work on that project is almost as far along as it is on some of these other projects being included.

Mr. KEESEE. I would almost say it was a little farther along.

Senator ANDERSON. I would, too. I am happy to have your confirmation.

Mr. KEESEE. We have all our studies made as to drainage. We have our land classification all made. We have located our main canal. We have selected our project area. Our economic studies are being drafted now to go into the report, and our final estimates are being prepared at the present time.

Senator ANDERSON. Now, can I revert back and ask, with reference to some of these other projects that were read off here today—I will talk to Mr. Larson now—is not that as far along Mr. Larson, as you are on some of these other projects, in fact farther?

Mr. LARSON. No. On the 11 participating projects, we have a detailed report already on file. On the Navaho they do not have a detailed report yet. I think that is the difference. Are you talking about the other projects we are working on, those we do not have a report on—which project are you comparing it with?

Senator ANDERSON. On the 11 projects included in here, are all of them farther along than the Navaho and Shiprock project?

Mr. LARSON. Yes, the 11 projects are farther along to this extent, we have a detailed report already on file, showing the economic justification and engineering feasibility.

Senator ANDERSON. He has that, too. He has economic feasibility. Do you not, Mr. Keesee?

Mr. KEESEE. Yes, in 1951, there is a report submitted to the Bureau of Indian Affairs on the lower project with our low line. That was submitted March 1951.

Senator WATKINS. It was a completed survey at that time?

Mr. KEESEE. That is right.

Senator WATKINS. In connection with this, part is for white people and part for Indians, is that right?

Mr. KEESEE. The 129,000 acres I spoke of a moment ago is all on Navaho land and would serve—that would be in the Navaho project for the Navaho Indians alone. In coming down with our main canal from the Kutz Canyon pump plant we would serve in the neighborhood of some 3,000 acres of land which would be served out of our main canal.

Senator WATKINS. I call your attention to section of the bill:

(c) in constructing, operating, and maintaining the Shiprock-South San Juan Indian irrigation project, the Secretary shall be governed by the laws relating to the development of irrigation projects on Indian reservation where applicable; and (d), as to Indian lands within, under or served by either or all participating projects, payment of construction costs shall be subject to the act of July 1, 1932.

You understand those laws?

Mr. KEESEE. Yes, sir.

Senator WATKINS. That means so long as the Indian owns it he never has to pay except for operating costs?

Mr. KEESEE. Yes, but it remains as a lien against the property.

Senator WATKINS. Yes, that is true but that would be one of those things probably Congress would have to make an appropriation to take care of the Indian part of it if the bill is adopted as drafted here.

Mr. KEESEE. That is correct.

Senator WATKINS. So that the economic justification for that would have to be something different than is submitted for these projects for the white people.

Senator ANDERSON. Let us be careful about that because it does not have to be something different. Whatever the Indian has in this public law he got in perfectly open fashion, Congress granted it to him and said that should be his preferred status.

Senator WATKINS. That is right but he does have a different status than the white people. Since there will be nothing paid by the Indian as long as the Indian owns it, we will have to look to Congress for a direct appropriation under that act.

Senator ANDERSON. Yes, but the situation happens to be that the project, once it is outlined, the Indian has his rights and the assessment goes against his land just as against the white land.

There is not a particle of difference, so many dollars an acre against each.

The difference is that Congress has said that since the Indian is a ward of the Government he will never be billed for that as long as he lives on and operates that land. Congress might have to make a contribution to that, but it should not change the economic feasibility.

Senator WATKINS. It would have to have a favorable benefit-cost ratio but at the same time it is in a different status from the projects that have to be repaid by white people. The basinwide project is charged to make it pay for these Indian lands that will not be repaid by the Indians, or at least nobody knows when. You cannot count on the Indians to pay back as long as it stays in Indian hands.

The economic studies are based as though it were white owned, and the economic studies are made the same as though it were for a white owned project.

Senator ANDERSON. It is not true that not one acre of Indian land would dip into this fund that comes from the breadwinners, those dams, in any different fashion than the white land?

Mr. KEESEE. That is right.

Senator ANDERSON. That extra money would come from congressional appropriation.

Senator WATKINS. I am talking about the money the irrigators would have to repay.

Mr. KEESEE. If they could pay say \$2 an acre over a 50-year period that \$100 would be deferred. The remaining costs of development would be paid out of the Colorado River Basin revenue.

Senator WATKINS. They could make it a bookkeeping operation and defer that amount that the overall project would have to pay and make it up out of the direct appropriation.

Senator ANDERSON. I am inclined to say I do not think the overhead the general fund raised by sale of power from Glen Canyon or Echo Park Dam would take care specifically of the Indian portion. The Congress has to appropriate for the Indian portion.

Senator WATKINS. That is what I meant. Because it is under a different law and if this bill is adopted as drafted that project, with respect to the payments the Indians have to make, would be governed by the other law.

Senator ANDERSON. The feasibility of it is as if every acre were white owned, is that right?

Mr. KEESEE. That is right.

Senator KUCHEL of California. On the question, Senator Anderson asked why the different treatment for San Juan-Chama, Shiprock, South San Juan Indian and also central Utah project what is the

difference, the reason for the different treatment in the bill? There you have projects which do specifically require additional specific authorization. Why was that provided for in this bill?

Senator WATKINS. The Indian lands would be benefited under the central Utah, isn't that true?

Mr. LARSON. Yes, sir, the Indians would get some regulated water under the initial development.

Senator WATKINS. Some of the lands now held in trust by the United States for Indians would be benefited by the smaller divisions of the central Utah project?

Mr. LARSON. Yes, sir.

Senator WATKINS. That is the reason for passing it the same as the Indian program in the Navaho reservation?

Mr. LARSON. We do not get to the large Indian holdings in this first phase.

Senator WATKINS. In the first phase we do not take it in?

Mr. LARSON. No.

Senator KUCHEL. You take it in in the first phase?

Senator WATKINS. Not until the second phase.

Mr. LARSON. We only go to Rock Creek in the first phase.

Senator KUCHEL (reading):

Provided further, That no appropriation for or construction of any part of the central Utah project, beyond the initial phase thereof, shall be made or begun until a report thereon shall have been submitted to the affected States pursuant to the Act of December 22, 1944 and approved by the Congress.

You have got that same restrictive language on the other two and I ask why that distinction.

Mr. LARSON. You are talking about conditional authorization of the ultimate phase of Central Utah?

Senator KUCHEL. And those two that Senator Anderson was speaking of San Juan-Chama and Shiprock.

Mr. LARSON. I did not attempt to report on the ultimate phase of central Utah.

Senator ANDERSON. The reason I think in our particular instance that there has been some dispute about taking water of the San Juan and putting it over in the Rio Grande Valley in New Mexico and in order that the people in Texas and lower New Mexico would not be alarmed by it and in order that California would not have to worry about diversion of water outside of the natural basin of the river, we put this language in to make sure the States would be adequately protected.

Senator KUCHEL. Does that statute which is cited in the bill require that the States involved approve it before Congress?

Senator ANDERSON. That is in the flood control act. It has to be submitted to them for comments but the Congress approves it. Not the States.

Senator KUCHEL. You are postponing the day of decision?

Senator ANDERSON. Yes.

Senator WATKINS. I want to hear what they say about it and after they get through we go ahead and do everything that ought to be done.

Senator ANDERSON. Mr. Chairman, I would like at a subsequent time to get the representative of the Bureau of Reclamation, of the Amarillo office stationed at Albuquerque, I would like to have him for question-

ing. I just wonder if there is objection to terminating it now that the Senate has adjourned.

Senator WATKINS. Mr. Dexheimer, will the gentleman mentioned by Senator Anderson be available?

Mr. DEXHEIMER. We will have someone here.

Senator ANDERSON. Mr. Mutz was the man I had in mind.

Senator WATKINS. You do not want to question him tonight, I take it?

Senator KUCHEL. Mr. Larson, just a couple of questions to clear up that question in my mind on the legal framework comments you make.

Is it true whether we talk about so-called storage project regulatory reservoirs with an interstate significance or participating projects which you suggest of an intrastate significance—it is true, nevertheless, that the Colorado River compact affects both of them, is it not?

Mr. LARSON. Yes, sir, but the intrastate are the main water consuming projects and the others are regulatory reservoirs and the only water they consume is evaporation.

Senator WATKINS. But there still is an overriding responsibility even in the intrastate project to comply with the Colorado River compact, is that not so?

Mr. LARSON. Yes; they are all under the Colorado River compact. I was putting them in the two categories to explain how they would be operated.

Senator WATKINS. And that the water law of the States involved would control the way the waters were placed to use?

Mr. LARSON. Yes; and the upper basin compact and the 1922 compact would control the others.

Senator WATKINS. What is that?

Mr. LARSON. For instance, in releasing water from the upper basin through the Glen Canyon and Echo Park Reservoir the findings of the upper Colorado River Commission as to water supply would be the control under which we would operate those reservoirs so long as it is in conformity to the 1922 compact.

Senator WATKINS. But likewise the 1922 compact where relevant would apply and control the intrastate participating projects, is that not true?

Mr. LARSON. Yes, sir.

Senator KUCHEL. On your summary table the cost per acre to the water users is not listed. It is easily obtained but I just wondered if you could make that available?

Mr. LARSON. You mean the cost per acre of providing the water?

Senator KUCHEL. Yes, the next to the—what is it, the penultimate, the next to the last column in this schedule says irrigational indication repayable by water users but do you have the figures broken down by acres?

Mr. LARSON. I can give you the next to the last column "irrigational allocation repayable by the water users" and divide it by the total acres. I can give you that figure for each of the projects.

Senator KUCHEL. Just file that with the chairman for the record.

Mr. LARSON. We will do that.

(The information referred to follows:)

ELEVEN PARTICIPATING PROJECTS

Project (1)	Total acres irrigated (2)	Irrigation allocation repayable by water users (3)	Col. 3 divided by col. 2 (dollars per acre) (4)
La Barge.....	7, 970	\$495, 000	\$62
Seedskadee.....	60, 720	4, 785, 000	79
Lyman.....	40, 600	2, 255, 000	56
Silt.....	7, 300	1, 020, 000	140
Smith Fork.....	10, 430	1, 045, 000	100
Pacoma.....	17, 040	2, 414, 000	142
Florida.....	18, 950	1, 711, 500	90
Pine River project extension.....	15, 150	2, 045, 000	135
Emery County.....	24, 080	3, 715, 000	154
Central Utah (Initial phase).....	160, 380	15, 191, 000	95
Hammond.....	3, 670	370, 000	101
Subtotal, initial projects.....	366, 290	35, 046, 500	96

ADDITIONAL PARTICIPATING PROJECTS IN THE BILL

Eden.....	20, 200	1, 500, 000	74
Gooseberry.....	16, 400	2, 375, 000	145
La Plata.....	9, 800	1, 245, 000	127
Navaho.....	151, 000	19, 440, 000	129
San Juan-Chama.....	200, 000	32, 335, 000	162
Subtotal, additional projects.....	397, 400	56, 895, 000	143
Grand total.....	763, 690	91, 941, 500	120

Senator KUCHEL. That is all the questions I have.

Senator WATKINS. At this point the committee will recess until tomorrow morning at 10 o'clock.

(At 6:10 p. m. the committee recessed until 10 a. m., June 29, 1954.)

COLORADO RIVER STORAGE PROJECT

TUESDAY, JUNE 29, 1954

UNITED STATES SENATE,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION
OF THE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room 457, Senate Office Building, Washington, D. C., Senator Eugene D. Millikin, Colorado (chairman of the subcommittee), presiding.

Present: Senators Eugene D. Millikin, Colorado (chairman of the subcommittee); Arthur V. Watkins, Utah; Clinton P. Anderson, New Mexico; and Thomas H. Kuchel, California.

Also present: Senator Wallace F. Bennett, Utah.

Also present: Elmer K. Nelson, staff consulting engineer; and N. D. McSherry, assistant chief clerk.

Senator MILLIKIN. The meeting will come to order.

Mr. Larson? You may proceed with your testimony now, Mr. Larson.

Senator ANDERSON. Mr. Chairman, we were at the point where I had asked questions about the elimination of the New Mexico projects, and Mr. Keesee, who is the head of the Indian irrigation service with headquarters at Gallup, had been brought up and he and Mr. Larson were more or less answering the questions together.

Senator MILLIKIN. Are you together now?

Senator ANDERSON. Mr. Keesee is back there.

Senator MILLIKIN. Come forward, please.

STATEMENT OF E. O. LARSON, REGIONAL DIRECTOR, BUREAU OF RECLAMATION, SALT LAKE CITY, UTAH, ACCOMPANIED BY C. J. JACOBSON, PROJECT ENGINEER, COLORADO RIVER PROJECT, AND G. B. KEESSEE, CHIEF OF THE BRANCH OF IRRIGATION FOR THE NAVAHO RESERVATION, GALLUP, N. MEX.

Senator ANDERSON. Mr. Keesee, have you any agreement with region 4 of the Bureau of Reclamation looking toward the joint development of the final report on the Navaho project?

Mr. KEESSEE. Yes, sir.

Senator ANDERSON. Will you tell me when that agreement was made?

Mr. KEESSEE. It was made the early part of June 1953.

Senator ANDERSON. How did that come about? Was there a directive or did instructions come from anybody to work together, comparable to the instructions that had been given 3 or 4 years ago working up to the joint project?

Mr. KEESEE. A directive from Secretary McKay, dated May 20, 1953.

Senator ANDERSON. May 20, 1953?

Mr. KEESEE. That is right.

Senator ANDERSON. To whom was the directive addressed?

Mr. KEESEE. It was addressed to both Commissioners of Reclamation and the Indian Service.

Senator ANDERSON. I have before me now a memorandum to the Commissioner of the Bureau of Indian Affairs and the Assistant Commissioner of the Bureau of Reclamation, from the Secretary, dated May 20.

Mr. KEESEE. That is right.

Senator ANDERSON. In connection with that, was there any distribution of work as to what you should do and what the Bureau of Reclamation should do?

Mr. KEESEE. Yes. We worked up a program for the distribution of the work between the two organizations.

Senator ANDERSON. Can you tell me how the work was to be divided? Were you supposed to do the fieldwork on the Shiprock project, for example, and were they supposed to do the work on the dam, or what was the agreement?

Mr. KEESEE. Well, insofar as the material investigations of the dam, we performed that part of it. We made the investigations. The Bureau of Reclamation drilled it. We had the field parties in. We also furnished information, topographic maps, in respect to the location of the main canal, and also made some studies or joined in the studies of the water reservoir studies.

Senator ANDERSON. Who furnished the money for this work?

Mr. KEESEE. We put up about \$37,000.

Senator ANDERSON. When did you put that up? Did you put it up to region 4?

Mr. KEESEE. Yes, region 4. There were two transfers of money. One was, as I recall it, about August or September of 1953, and the other one was in March of 1954.

Senator ANDERSON. How much in 1953 and how much in March of 1954?

Mr. KEESEE. There was \$33,000 in 1954 and I believe \$47,000 in 1953. Those both were 1954, Senator.

Senator ANDERSON. What was region 4 supposed to do with the money?

Mr. KEESEE. That was our share to pay for the investigations, our cost of the investigation necessary for the joint project works.

Senator ANDERSON. I am trying to pinpoint what they were supposed to do and what you were supposed to do. Was there any division of work such as what you were supposed to do and what part they were supposed to do, or were you both working generally over the whole field?

Mr. KEESEE. Yes, there was. They were supposed to carry out all parts, the greater part, of the work for the joint works investigations.

Senator ANDERSON. Did they have the responsibility for having the plans for the Navaho Dam in shape?

Mr. KEESEE. Yes.

Senator ANDERSON. Who was to take charge of the canal that runs from the dam down to the Kutz Canyon pumping plant?

Mr. KEESEE. That was a part of their work, of the division.

Senator ANDERSON. Who was to take the canal from Kutz Canyon?

Mr. KEESEE. We were.

Senator ANDERSON. The Indian Irrigation Service?

Mr. KEESEE. That is right.

Senator ANDERSON. How far along are you with your survey from Kutz Canyon?

Mr. KEESEE. We have our line all in, surveyed.

Senator ANDERSON. How much have they done on the survey from the dam down to Kutz Canyon?

Mr. KEESEE. There has been a paper location made on a contour map.

Senator ANDERSON. And with the work on the dam itself, have they given you a final report on the dam?

Mr. KEESEE. No, sir.

Senator ANDERSON. Did you set any time limit when you expected that report to be ready in the discussion between the two of you?

Mr. KEESEE. No, sir.

Senator ANDERSON. When did you expect it to be ready?

Mr. KEESEE. Well, I anticipate it will probably be ready this year, by June 30.

Senator ANDERSON. Mr. Larson, how far along is the plan on the Navaho Dam?

Mr. LARSON. Senator Anderson, the drilling for the Navaho Dam was done prior to this agreement.

Senator ANDERSON. The drilling was done a long time ago. I mean since the agreement was perfected. Maybe I can get at it this way. They allotted you \$40,000 or so. Have you spent it?

Mr. LARSON. I don't know what part of that money has been spent, but we have been working very closely with the data obtained by Mr. Keesee's office on the land, dam materials, getting, you might say, better information. But we do have a preliminary design of the dam for the 1950 report prepared by the chief engineer of the Bureau of Reclamation, which I testified yesterday was in as good a shape as the other dams have for initial construction.

Senator ANDERSON. But that is the 1950 report. Has nothing been done since the 1950 report?

Mr. LARSON. Yes, considerable work has been done, you might say, leading to a definite plan report or a more detailed report now scheduled for completion—I don't know what date—by the Bureau of Indian Affairs. We will contribute certain parts to that report. Our contributions being the data on the dam, and the—

Senator ANDERSON. Stop right there. Is the data on the dam ready?

Mr. LARSON. I think so.

Senator ANDERSON. All right, that is ready. You can give that to them. What else can you give them?

Mr. LARSON. We are working jointly on the design of the 2,700 second-foot main canal for the Navaho project; we have worked out preliminary estimates for the hydraulic pump, and we have located the canal on the South San Juan division. We are prepared to contribute the chapter on economics and repayment for the South San Juan division, and to turn it over to the Bureau of Indian Affairs for incorporating in a detailed project report covering the entire Navaho project.

Senator ANDERSON. The economic report is ready?

Mr. LARSON. Not yet. We are scheduling our work to fit in with Mr. Keesee's program of completing the entire report.

Senator ANDERSON. If the paper location for this canal has been made, based upon field surveys and topography, don't you have sufficient data to determine the costs?

Mr. LARSON. I think the estimate is quite far along. Mr. Keesee probably knows better than I do how far along our joint forces are on it.

Mr. KEESEE. Terrell, from the chief engineer's office, came down last month to go over the site on the ground to prepare to begin the design studies and estimates. That was in May.

Senator ANDERSON. May of 1954?

Mr. KEESEE. Yes.

Senator ANDERSON. What is his name?

Mr. KEESEE. Mr. Terrell, from the chief engineer's office.

Senator ANDERSON. Can I get back to this money question. If they turned over to you some \$33,000 in March of this year, who would know how much of that has been spent?

Mr. LARSON. My office would know. A certain portion of that, quite a portion, was turned over to the chief engineer's office at Denver for preparing the plans and estimates of this very complicated and expensive canal. It has a large capacity, 2,700 second-feet, and is on quite a difficult location. The estimates and designs are being prepared by the chief engineer's office at Denver.

Senator ANDERSON. You wouldn't know whether they have spent any of the money, though?

Mr. LARSON. I can get that information by teletype from our Salt Lake office for you.

Senator ANDERSON. Would you do that, please?

Mr. LARSON. Very well.

Senator ANDERSON. The reason I asked the question, Mr. Larson, is that my information was that a good deal of the money is still not touched, maybe as much as twenty or twenty-five thousand dollars of it.

Mr. KEESEE. I can clear it up, Senator.

Senator ANDERSON. Thank you.

Mr. KEESEE. I received a report from Mr. Larson's office, as of May 30, and there was approximately \$30,000 of the \$33,000 unexpended as of June 1.

Senator ANDERSON. \$30,000 of the \$33,000 still unexpended as of June 1?

Mr. KEESEE. Yes, sir.

Senator ANDERSON. If you are going to have this completed by June 30, it would seem to me you ought to be spending some of that money, shouldn't you, Mr. Larson?

Mr. LARSON. It may be that it isn't all required, I don't know. I think we are keeping up pretty well with our part of the program.

Senator ANDERSON. I am only trying to find out why this Navaho Dam isn't in the bill and why it isn't ready to go. If money was turned over for the completion of these assignments, in March, some \$33,000, and \$30,000 of it was still unexpended June 1, not much work has been going on. Is that right?

Mr. LARSON. Well, I think most of this money is for the canal, not the dam.

Senator ANDERSON. The two go along together. They are indivisible, they have to go together. If they build a dam, they want some place to put the water. We had testimony that the dam is ready, that you have the necessary information on the dam. You made borings in 1950. Your 1946 report has a great deal of information on it. I went over the area in 1948 and there were crews that had been working for a long time. Quite obviously a great deal of information exists on the dam. And you say it can be prepared at once.

Why do we not get that step out of the road? If all that information was in, then we might have some reason to add this dam to the other additional projects. I like the bill as originally introduced, and I would like to see the authorization go to the Glen Canyon Dam, the Echo Park Dam, to the Curecanti Dam in Colorado, which the House committee inserted, and to the Navaho Dam in New Mexico, which were the four initial projects under this bill.

For some reason the Navaho Dam isn't recommended now. It was recommended 6 months ago. It is gone now.

Senator MILLIKIN. Why is not the Navaho Dam in here?

Mr. LARSON. The Navaho Dam is on the San Juan River a short distance downstream from the Colorado-New Mexico line.

Senator MILLIKIN. I would like to have someone tell me why the dam isn't here.

Mr. LARSON. Sir?

Senator MILLIKIN. I would like to know why the Navaho Dam isn't in the bill. If you cannot tell us, is there anyone here who can tell?

Mr. LARSON. I will clear that up in just a moment, Mr. Chairman.

I tried to make it clear yesterday, Senator Anderson, that we had sufficient information on the Navaho Dam in the 1950 report for authorization.

Senator ANDERSON. Yes, you did make it clear, and I thought that was a fine contribution, and I appreciated it. If the material was ready in 1950, so it could be included in this report, it certainly is also ready in 1954 and could have been included in this report.

Senator MILLIKIN. Senator, I have a question that I am trying to get answered. Why is not the Navaho Dam in the present proposal?

Mr. DEXHEIMER. The Secretary did at one time recommend the Navaho Dam as one of the storage projects. You had put into your record yesterday a letter from the Executive Office of the President, the Bureau of the Budget, dated March 18, 1954. Paragraph 6 of that letter reads as follows:

Provisional authorization of the Shiprock unit of the Navaho project would not be in accord with the program of the President at this time. This advice is without prejudice to further consideration of the project when a report is completed indicating its economic justification, the views of the affected States and agencies and the relation of the project to other potential uses of water of the San Juan River.

With that letter of the Bureau of the Budget, it was taken out of the Secretary's recommended projects.

Senator MILLIKIN. Could it be put in with later determinations of feasibility?

Mr. DEXHEIMER. Yes, sir.

Senator ANDERSON. Has it not been determined that it is not a question of feasibility on the dam? The reservoir has to be there to regulate streamflow, doesn't it?

Mr. DEXHEIMER. Yes, sir.

Senator ANDERSON. So it is not a question of feasibility on the dam. You do not prove feasibility on a single dam, do you? If so, we would throw out a good many of the ones in this project, wouldn't we?

Mr. DEXHEIMER. Yes.

Senator ANDERSON. Can you determine feasibility of Curecanti just on that dam alone?

Senator MILLIKIN. Senator Anderson, may I suggest that you state what you want to have in the bill?

Senator ANDERSON. I want the Navaho Dam put in the bill as an initial project, as the House put in the Curecanti Dam and as we have the Glen Canyon Dam and Echo Park Dam. The Navaho Indians in the first place feel that they have rights in this matter.

Senator MILLIKIN. Now, Mr. Dexheimer, why cannot the Navaho Dam be put in the bill in accordance with Senator Anderson's suggestion?

Mr. DEXHEIMER. There is no reason at all, Senator. It could be put in on that provisional basis the same as others. There is only one point I would like to make, and that is the question of what we are going to do with the water after we build the dam.

Senator MILLIKIN. Thank you very much.

Senator ANDERSON. We can suggest what to do with the water after we get the dam.

Senator MILLIKIN. I suppose your arguments will be persuasive on that point.

Senator ANDERSON. Mr. Chairman, if we could get some sort of agreement to leave the Navaho Dam in the bill on the basis as in your original bill, and leave the other projects on a conditional basis, then I am perfectly happy.

Senator MILLIKIN. This isn't the time for that. That will be settled in executive session. This is not the time to settle that. But has not the witness given you what you want?

Senator ANDERSON. Yes, but the trouble was that when they finished with the House hearings there had been no presentation of information on these New Mexico projects and they just proceeded to take them out of the House bill on the basis that there was no justification for them.

Senator MILLIKIN. Aren't you satisfied now as far as we have gone, short of a meeting of the executive committee?

Senator WATKINS. Yesterday we put in evidence the detail about this project.

Senator ANDERSON. I believe if I can ask Mr. Keesee a question which does not relate to the economic justification, it would be helpful. If these figures are available for which money has been contributed, how long would it take you to get a complete feasibility report?

Mr. KEESEE. Probably about 3 months, ready for submission to the States and the other Federal agencies?

Senator ANDERSON. May I ask, Mr. Larson, how far along are you with the area comprising the 29,000 acres of white land? Are you in a similar situation on the 29,000 acres owned by the whites?

Mr. LARSON. We are just as far along with that as the Indian Bureau is with the shiprock division, I would say.

Senator ANDERSON. I have no further questions.

Senator KUCHEL. May I inquire, among the statistical data which you presented yesterday, have you included the financial operation studies of the reservoir relative to pay out? I remember one printed form, which I do not have in front of me now. Do you have statistical information with respect to the pay-out periods of the various reservoirs?

Mr. LARSON. We have pay-out schedules for the Glen Canyon and Echo Park units of the Colorado storage project and the 11 participating projects recommended by the Secretary.

Senator KUCHEL. Those are now in the record, Mr. Larson?

Mr. LARSON. No, they are not in the record.

Senator KUCHEL. May they be placed in the record, Mr. Chairman?

Mr. LARSON. Yes, sir; we have copies available for the record.

Senator KUCHEL. Will they also include the projects to which Senator Anderson has referred?

Mr. LARSON. No, sir.

Senator KUCHEL. Could that be put in?

Mr. LARSON. We have another schedule with the additional projects in the bill.

Senator KUCHEL. Including the ones to which Senator Anderson has referred?

Mr. LARSON. No, we do not have the pay-out schedule, with the Navaho Dam included.

We can prepare it, but we do not have it now.

Senator KUCHEL. Is that not a relevant fact for the committee to determine? I think that information is something that should be in the record.

Mr. LARSON. If it is information the committee wants, we can work a pay out with the Navajo Dam added.

Senator KUCHEL. I would ask, Mr. Chairman, that that information be supplied and put into the record.

Senator MILLIKIN. Can you supply it?

Mr. LARSON. We can supply it. It will take a day or two, but we can supply it and it will be put into the record.

(The following table was subsequently received for the record:)

Colorado River storage project and participating projects—Financial operation study for examination of investment repayment from power revenues
 (Colorado River storage project consisting of Glen Canyon, Echo Park, and the power features of the initial phase of the central Utah project)

[Units: Cols. 3 to 7, million kilowatt-hours; cols. 8 to 18, thousand dollars]

Year of study	Fiscal year	Sales of electric energy				Power revenues sales of electric energy				Revenue deductions			Net power revenue, (10)-(13) ¹	Power investment during year including interest during construction ²	Amortization of power investment		Irrigation assistance from net power revenues
		Central Utah		Glen Canyon firm		Pumping at (3.0 mills)	Firm at (6.0 mills)	Total, (8)+(9)	Provisions for emergency expense	Operation, maintenance, overhead, and replacement	Total, (11)+(12)	2½ per cent interest on unpaid balance			(16)	(17)	
		Pumping	Firm	Echo Park unit, firm	Tota												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
0	1961			592	1,164	1,743	0	\$10,458	\$10,458	\$195	\$1,972	\$2,097	\$8,301	\$864,970	\$9,124	\$864,970	
1	1962	0	17	1,117	1,740	2,874	0	17,244	17,244	125	3,101	3,316	13,928	53,830	10,489	410,563	
2	1963	0	23	1,111	2,312	3,446	0	20,675	20,675	125	3,861	3,986	16,690	30,366	10,489	446,408	
3	1964	0	23	1,104	2,880	4,007	0	24,042	24,042	125	4,531	4,656	19,388	30,366	11,682	471,328	
4	1965	0	23	1,097	3,444	4,364	0	27,384	27,384	125	5,208	5,323	22,088	31,373	11,753	494,091	
5	1966	0	25	1,091	4,003	5,119	0	30,714	30,714	125	5,898	6,023	24,091	26,235	12,852	515,798	
6	1967	0	25	1,084	4,599	5,198	0	31,188	31,188	125	6,588	6,713	24,945	26,235	12,894	529,196	
7	1968	0	362	1,077	5,975	5,414	0	32,484	32,484	125	6,278	6,403	26,081	19,700	13,280	557,581	
8	1969	0	362	1,071	6,961	5,394	0	32,364	32,364	0	6,403	6,403	26,961	13,113	11,153	511,682	
9	1970	0	362	1,064	7,947	5,373	0	32,238	32,238	0	6,403	6,403	27,846	12,762	12,762	498,689	
10	1971	0	362	1,057	8,933	5,352	0	32,112	32,112	0	6,403	6,403	28,731	12,406	12,406	465,396	
11	1972	1.3	361	1,051	9,919	5,331	\$4	31,986	31,990	0	6,403	6,403	29,606	12,049	12,049	432,103	
12	1973	2.2	360	1,044	10,904	5,308	7	31,860	31,855	0	6,403	6,403	30,481	11,692	11,692	400,291	
13	1974	2.2	360	1,037	11,889	5,287	7	31,722	31,729	0	6,403	6,403	31,356	11,335	11,335	370,169	
14	1975	2.2	360	1,031	12,876	5,267	7	31,602	31,609	0	6,403	6,403	32,231	11,000	11,000	341,422	
15	1976	2.2	360	1,024	13,862	5,246	7	31,476	31,483	0	6,403	6,403	33,106	10,684	10,684	314,327	
16	1977	2.2	360	1,017	14,848	5,225	7	31,350	31,357	0	6,403	6,403	34,000	10,388	10,388	290,550	
17	1978	2.2	360	1,011	15,834	5,205	7	31,224	31,237	0	6,403	6,403	34,914	10,100	10,100	269,550	
18	1979	2.2	360	1,004	16,820	5,184	7	31,104	31,111	0	6,403	6,403	35,848	9,828	9,828	250,550	
19	1980	2.2	360	998	17,806	5,162	7	30,974	30,979	0	6,403	6,403	36,792	9,572	9,572	233,550	
20	1981	2.2	360	992	18,792	5,141	7	30,844	30,851	0	6,403	6,403	37,746	9,326	9,326	218,550	
21	1982	2.2	360	986	19,778	5,120	7	30,714	30,781	0	6,403	6,403	38,700	9,090	9,090	205,550	
22	1983	2.2	360	980	20,764	5,099	7	30,584	30,659	0	6,403	6,403	39,664	8,864	8,864	194,550	
23	1984	2.2	360	974	21,750	5,078	7	30,454	30,531	0	6,403	6,403	40,638	8,648	8,648	185,550	
24	1985	2.2	360	968	22,736	5,057	7	30,324	30,401	0	6,403	6,403	41,622	8,442	8,442	178,550	
25	1986	2.2	360	962	23,722	5,036	7	30,194	30,271	0	6,403	6,403	42,616	8,246	8,246	173,550	
26	1987	2.2	360	956	24,708	5,015	7	30,064	30,141	0	6,403	6,403	43,620	8,060	8,060	170,550	
27	1988	2.2	360	950	25,694	4,994	7	29,934	29,980	0	6,403	6,403	44,634	7,884	7,884	169,550	
28	1989	2.2	360	944	26,680	4,973	7	29,804	29,850	0	6,403	6,403	45,658	7,718	7,718	170,550	
		2.2	360	938	27,666	4,952	7	29,674	29,720	0	6,403	6,403	46,692	7,562	7,562	173,550	
		2.2	360	932	28,652	4,931	7	29,544	29,590	0	6,403	6,403	47,736	7,416	7,416	178,550	
		2.2	360	926	29,638	4,910	7	29,414	29,460	0	6,403	6,403	48,790	7,280	7,280	185,550	
		2.2	360	920	30,624	4,889	7	29,284	29,330	0	6,403	6,403	49,854	7,154	7,154	194,550	
		2.2	360	914	31,610	4,868	7	29,154	29,200	0	6,403	6,403	50,928	7,038	7,038	206,550	
		2.2	360	908	32,596	4,847	7	29,024	29,070	0	6,403	6,403	52,012	6,932	6,932	221,550	
		2.2	360	902	33,582	4,826	7	28,894	28,940	0	6,403	6,403	53,106	6,836	6,836	239,550	
		2.2	360	896	34,568	4,805	7	28,764	28,810	0	6,403	6,403	54,210	6,750	6,750	261,550	
		2.2	360	890	35,554	4,784	7	28,634	28,680	0	6,403	6,403	55,324	6,674	6,674	287,550	
		2.2	360	884	36,540	4,763	7	28,504	28,550	0	6,403	6,403	56,448	6,608	6,608	318,550	
		2.2	360	878	37,526	4,742	7	28,374	28,420	0	6,403	6,403	57,582	6,552	6,552	355,550	
		2.2	360	872	38,512	4,721	7	28,244	28,290	0	6,403	6,403	58,726	6,506	6,506	400,550	
		2.2	360	866	39,498	4,700	7	28,114	28,160	0	6,403	6,403	59,880	6,470	6,470	455,550	
		2.2	360	860	40,484	4,679	7	27,984	28,030	0	6,403	6,403	61,044	6,444	6,444	523,550	
		2.2	360	854	41,470	4,658	7	27,854	27,900	0	6,403	6,403	62,218	6,428	6,428	607,550	
		2.2	360	848	42,456	4,637	7	27,724	27,770	0	6,403	6,403	63,402	6,422	6,422	721,550	
		2.2	360	842	43,442	4,616	7	27,594	27,640	0	6,403	6,403	64,596	6,426	6,426	871,550	
		2.2	360	836	44,428	4,595	7	27,464	27,510	0	6,403	6,403	65,800	6,430	6,430	1,063,550	
		2.2	360	830	45,414	4,574	7	27,334	27,380	0	6,403	6,403	67,014	6,434	6,434	1,303,550	
		2.2	360	824	46,400	4,553	7	27,204	27,250	0	6,403	6,403	68,238	6,438	6,438	1,603,550	
		2.2	360	818	47,386	4,532	7	27,074	27,120	0	6,403	6,403	69,472	6,442	6,442	1,973,550	
		2.2	360	812	48,372	4,511	7	26,944	26,990	0	6,403	6,403	70,716	6,446	6,446	2,433,550	
		2.2	360	806	49,358	4,490	7	26,814	26,860	0	6,403	6,403	71,970	6,450	6,450	3,003,550	
		2.2	360	800	50,344	4,469	7	26,684	26,730	0	6,403	6,403	73,234	6,454	6,454	3,703,550	
		2.2	360	794	51,330	4,448	7	26,554	26,600	0	6,403	6,403	74,508	6,458	6,458	4,553,550	
		2.2	360	788	52,316	4,427	7	26,424	26,470	0	6,403	6,403	75,792	6,462	6,462	5,573,550	
		2.2	360	782	53,302	4,406	7	26,294	26,340	0	6,403	6,403	77,086	6,466	6,466	6,773,550	
		2.2	360	776	54,288	4,385	7	26,164	26,210	0	6,403	6,403	78,390	6,470	6,470	8,153,550	
		2.2	360	770	55,274	4,364	7	26,034	26,080	0	6,403	6,403	79,704	6,474	6,474	9,723,550	
		2.2	360	764	56,260	4,343	7	25,904	25,950	0	6,403	6,403	81,028	6,478	6,478	11,493,550	
		2.2	360	758	57,246	4,322	7	25,774	25,820	0	6,403	6,403	82,362	6,482	6,482	13,473,550	
		2.2	360	752	58,232	4,301	7	25,644	25,690	0	6,403	6,403	83,706	6,486	6,486	15,673,550	
		2.2	360	746	59,218	4,280	7	25,514	25,560	0	6,403	6,403	85,060	6,490	6,490	18,103,550	
		2.2	360	740	60,204	4,259	7	25,384	25,430	0	6,403	6,403	86,424	6,494	6,494	20,773,550	
		2.2	360	734	61,190	4,238	7	25,254	25,300	0	6,403	6,403	87,798	6,498	6,498	24,683,550	
		2.2	360	728	62,176	4,217	7	25,124	25,170	0	6,403	6,403	89,182	6,502	6,502	29,933,550	
		2.2	360	722	63,162	4,196	7	24,994	25,040	0	6,403	6,403	90,576	6,506	6,506	36,733,550	
		2.2	360	716	64,148	4,175	7	24,864	24,910	0	6,403	6,403	91,980	6,510	6,510	44,183,550	
		2.2	360	710	65,134	4,154	7	24,734	24,780	0	6,403	6,403	93,394	6,514	6,514	52,383,550	
		2.2	360	704	66,120	4,133	7	24,604	24,650	0	6,403	6,403	94,818	6,518	6,518	62,433,550	
		2.2	360	698	67,106	4,112	7	24,474	24,520	0	6,403	6,403	96,252	6,522	6,522	74,453,550	
		2.2	360	692	68,092	4,091	7	24,344	24,390	0	6,403	6,403	97,696	6,526	6,526	88,55	

Senator MILLIKIN. That will be all for the time being.

Please hold yourself available.

The next witness is the Honorable Norman W. Barlow, president of the Green River Development Co. and assistant interstate stream commissioner for Wyoming.

Is the gentleman in the room?

The next witness is the Honorable Joseph L. Budd, assistant Colorado River commissioner for Wyoming.

Senator ANDERSON. You know that old story, if nobody else has anything to say, we can say a few words about Los Angeles.

Mr. WILL. Mr. Chairman, the additional Wyoming witnesses were delayed. I wonder if we might proceed with the delegation from Utah?

Senator MILLIKIN. Mr. Budd is not here?

Mr. WILL. No, sir; he has not arrived yet.

Senator MILLIKIN. Our next witness is the Honorable George D. Clyde, commissioner of interstate streams for the State of Utah.

STATEMENT OF GEORGE D. CLYDE, COMMISSIONER OF INTERSTATE STREAMS FOR UTAH

Mr. CLYDE. Mr. Chairman and members of the committee. It is an honor to appear before this body as a representative of the State of Utah to present its case relative to the upper Colorado River storage project.

My name is George D. Clyde. I am a civil engineer and commissioner of interstate streams for Utah, and appear here as a representative of the State of Utah.

In order to save time, Mr. Chairman, I submit for the record my formal written statement which I will now briefly summarize for the committee.

Senator MILLIKIN. It will be included in the record.

(Mr. Clyde's statement follows:)

STATEMENT OF GEORGE D. CLYDE, COMMISSIONER OF INTERSTATE STREAMS FOR UTAH, RELATING TO THE COLORADO RIVER STORAGE PROJECT AND ITS PARTICIPATING PROJECTS

My name is George D. Clyde. I am a civil engineer and commissioner of interstate streams for Utah and appear here as a representative for the State of Utah. I have spent 25 years in the field of irrigation, hydrology, and water supplies and their utilization in the 17 Western States. I am familiar with the characteristics of flow and uses of water from western streams and particularly the Colorado River.

Utah is one of the four upper division States as defined by the Colorado River compact of 1922. The only source of water in these States is the precipitation which falls upon them. That water is essential to human, animal, and plant life and basic to the welfare of these States. It is necessary to public health. It is required for the processing of raw materials. These are all consumptive uses and for such uses there is absolutely no substitute for water.

The upper Colorado, the last large undeveloped and uncontrolled western river, drains an area noted for its abundant but dormant natural resources. Approximately 90 percent of the flow of the entire Colorado River system originates in the upper Basin States and lacking facilities for river control and use, this flow, except for some 2 million acre-feet annually now consumptively used in the upper basin, discharges into the lower basin and a considerable amount passes unused into the Pacific Ocean. River controls at the Hoover, Parker, and Davis Dams have reduced floods and provided water and power for irrigation, municipal, and industrial purposes, all of which have made possible economic growth in the lower basin unparalleled in the history of our country.

The upper Basin States, with their enormous agricultural and industrial possibilities, can never develop and overcome this economic disparity until facilities for the control and use of the water and power in the upper Colorado River Basin, to which they are entitled under the Colorado River compact, are made available to them. It is no exaggeration to say that the future of the upper Basin States (Utah, Colorado, Wyoming, New Mexico, and Arizona) is dependent upon the beneficial consumptive use of the waters allocated to them under the Colorado River compact from their "last water hole," the upper Colorado River.

The climate of Utah is arid. The annual precipitation varies from about 5 inches on the desert areas to as much as 40 inches in the high mountains. Most of the precipitation occurs during the winter months and comes in the form of snow which accumulates on the high watersheds and forms the principal source of the streams and springs. The runoff from the melting snow usually occurs before July 1 and the remaining late season runoff is not sufficient to meet the water requirements for agricultural or other purposes. Utah's land area consists of the rugged Wasatch Mountain Range running north and south through the center of the State, the high Uintah Mountains running east and west along a portion of the north boundary of the State, valleys of deep fertile arable soil, and extensive desert areas for the most part nonarable due to topography, poor soil, or salt accumulations. The Wasatch Range divides the State into two parts—the west half, the Bonneville Basin, and the east half, the Colorado Basin. The raw materials basic to industrial development are found in both basins.

Irrigation agriculture, as an industry, was born in Utah and has played a major role in the development of the State and the West. Agriculture is the basic industry in the State in spite of the fact that only about 6 percent of the State's area is arable and 3.2 percent now cropped. Utah's agriculture is characterized by the production of general farm crops, fruits and vegetables for canning, and sugar beets. It is intimately tied up with livestock, dairying, and poultry production. It is the irrigated area in Utah that makes it possible to utilize the large areas of range and forest lands for grazing purposes. The crops produced in Utah are not in competition with the major crops of the Nation. Except for fruits, vegetables, canning crops, and sugar beets, the crops are harvested largely through livestock. The crop production in Utah will not greatly influence the total national production.

The irrigated area in Utah is 1,167,000 acres, less than 2.2 percent of the area of the State. The participating projects in Utah proposed in S. 1555 (central Utah, Gooseberry, and Emery County) cover lands in both the Bonneville Basin and the upper Colorado River Basins in Utah. Within these projects there are 400,000 acres of irrigated land needing a supplemental water supply and 600,000 acres of irrigable land needing a full water supply. There is not enough water in the Colorado and Bonneville Basins to meet the total needs of these lands, most of which are in the Bonneville Basin. It is proposed in the 3 participating projects in Utah to irrigate 32,200 acres of new land and furnish supplemental water for 168,670 acres of land now irrigated under the initial authorization, and ultimately to irrigate about 200,000 acres of new land and furnish a supplemental water supply to 250,000 additional acres (see report of hearings on H. R. 4449, 83d Cong., 2d sess., January 18-28, 1954, pp. 369-373).

Although Utah's arable land area is limited, the lack of water is the real bar to its future growth. Utah's principal source of water is the snow which accumulates on the high watersheds. Runoff from snow-fed streams does not coincide with irrigation or power demands. On streams not regulated by storage, most irrigation water supplies are exhausted by midsummer. In Utah, in spite of considerable development of storage, more than 60 percent of the currently irrigated land suffers severe water shortages annually. In total, there is ample water in the State of Utah to satisfy reasonably well its municipal, agricultural, and industrial needs but this water is not available in the right amounts, at the right time, or in the right place. For example, the last remaining major water source in Utah is the Colorado River. The major land resources are not in the Colorado River Basin, but in the Bonneville Basin. Therefore, in order for Utah to utilize consumptively its share of the waters of the Colorado River, which amounts to 1,714,000 acre-feet annually, these waters must first be controlled by storage and then conveyed from the points of storage to the points of use. This means, in Utah, that storage for regulation, irrigation water by exchange and power must be provided on the main stem of the Colorado River and that water from its high tributaries be diverted and conveyed by gravity across the mountains to the Bonneville Basin. There is ample water within Utah's share of the Colorado River to satisfy all the needs of the Colorado drainage area in Utah and to provide water for transmountain diversion to the Bonneville Basin.

Utah is a vast storehouse of raw materials, both metallic and non-metallic. It contains basic materials for a great chemical industry. It has major supplies of coal, oil, shale, ferrous and nonferrous minerals, oil and gas, sand and gravel, limestone and salt. It lacks adequate supplies of water and low-cost power with which to process them.

Utah has long been a feeder State. Its raw materials have been shipped to other centers for processing. Its children have had to seek employment elsewhere. The development of Utah's industrial resources will provide urgently needed processed materials for use locally and nationally and provide employment for its people. It will expand and stabilize the State's economy. Such development of the ferrous and nonferrous metal industries will require large quantities of water and power. The chemical and fertilizer industries for

which all the raw materials are available, require large quantities of water and power. Utah has great coal and oil shale deposits. The processing of these materials requires large quantities of water and power.

Utah's power market, consisting of rural farm, city, and urban residential, commercial, industrial, and special requirements, is growing rapidly. An analysis of future power requirements in Utah shows that by 1970 the Utah power market could absorb nearly the entire power output of Echo Park and Glen Canyon powerplants. An analysis of the water requirements for industrial development and related domestic and municipal uses shows a potential use by 1970 of 200,000 acre-feet annually (see report of hearings on H. R. 4449, 83d Cong., 2d sess., January 18-28, 1954, pp. 361-367).

Since 1940, the population of Utah has increased 27.9 percent and by 1970 is expected to be 1,100,000. Population increases mean more water for municipal and industrial uses and bigger power demands. More people require more food and fiber and more job opportunities. Increased agricultural production made possible by more water will provide more food and fiber. At the recent Mid-Century Conferences on Resources for the Future, it was ably demonstrated that within 25 years, this country will urgently need 40 to 45 million additional acres of productive land. It will take 25 years to fully develop even the initial phase of the central Utah project. Therefore, the construction of these proposed projects will not create overproduction.

The Colorado River is Utah's last waterhole. The proposed Colorado River storage project and the participating projects in Utah will make possible the beneficial consumptive use of Utah's share of the river. The proposed Echo Park and Glen Canyon Dams will provide the storage necessary for the initial regulation of the river in order that the upper basin States may meet their commitments to the lower basin States as set forth in the Colorado River compact, provide for the generation of power, the revenues from which, after the power features are paid for with interest, will be used to help pay the reimbursable costs of the participating projects above the ability of the irrigation water users to pay. These two dams, and the reservoirs created by them, will provide the major portion of the storage and power requirements. There are no substitutes for either of them. It has been determined by many careful engineering investigations that the Echo Park Dam is the key structure in the entire project. It must be included in any combination of reservoirs if minimum power costs, minimum water losses, and access to power load centers in the upper basin are to be obtained. Evaporation losses in excess of 100,000 acre-feet per year will be incurred with any combination of reservoirs not including Echo Park. Such water losses cannot be tolerated in order to satisfy those who would, in the name of conservation, bottle up forever urgently needed resources.

Utah's participating projects, as set forth in the bill which is the subject of this hearing, are:¹

1. Central Utah (initial phase).
2. Gooseberry.
3. Emery County.

¹ For detailed data relating to these projects, refer to hearings before the Subcommittee on Irrigation, Committee on Interior and Insular Affairs, House of Representatives, 83d Cong., 2d sess., H. R. 4449, January 18-28, 1954, pp. 369-374.

The central Utah (initial phase) will provide for the storage and conveyance of water from Colorado River tributaries for use in the Uintah Basin, which is a part of the Colorado River Basin in Utah, and the Bonneville Basin, where limited water supplies are preventing agricultural, municipal, and industrial development. The central Utah project will provide a full water supply for 28,540 acres of new land and a supplement supply for 131,840 acres of land which is now partially irrigated. It will provide 48,000 acre-feet of water annually for municipal and industrial purposes. These consumptive uses will deplete the flow of the Colorado River an estimated 189,000 acre-feet annually. The central Utah project will have 61,000 kilowatts installed electrical generating capacity and will generate 373 million kilowatt-hours annually. The estimated total cost of the project as of 1953 is 231 million dollars of which 6 million is nonreimbursable. Of this total, power will repay \$47 million, municipal water will repay \$45 million, and 127 million will be charged to irrigation. Of this, the water users will repay 15 million and the balance will come from power revenues from the Echo and Glen Canyon powerplants. The power, municipal, and irrigation allocations will be paid out within 50 years. This project will provide for flood protection, and water and power for agricultural and municipal uses and for the rapidly growing iron, steel, metal alloy, chemical, and fertilizer industries in Utah.

The Gooseberry project located in central Utah consists of a storage reservoir on the Price River, a tributary to the Colorado, and a transmountain diversion tunnel to the San Pitch River, a tributary to the Sevier River in the Bonneville Basin. The Sanpete Valley which is supplied with water from the San Pitch River, is an established agricultural area. Its agricultural production, however, is limited to subsistence by annual water shortages. These annual water shortages will be practically eliminated on 16,400 acres of land by the construction of this project which will provide supplemental water for this area and stabilize its agriculture.

This project will deplete the flow of the Colorado River by 12,500 acre-feet annually. It will cost \$5,760,500, of which \$33,000 is nonreimbursable. Of the reimbursable costs, the water users will repay \$2,375,000 and \$3,352,000 will come from power revenues.

The Emery County project is located in the Colorado River Basin and is similar to the Gooseberry in that it will provide a supplemental supply of water to an established agriculture area, except that in the Emery County project some new land will be included. The project consists of a storage reservoir, a diversion dam, and a main canal to distribute the storage water to the existing irrigation companies. The Emery County project will provide a supplemental water supply for 20,450 acres of land and a full supply for 3,630 acres. This additional water will expand the agriculture of the area through the introduction of late season crops and stabilize both the production of forage and the livestock industry which is dependent on it.

The Emery County project will deplete the flow of the Colorado River, by 15,500 acre-feet annually and will cost \$9,865,500, of which \$229,000 is nonreimbursable. Of this reimbursable cost, the water users will pay \$3,715,000 and the balance of \$5,921,000 will come from power revenues.

These projects have been shown by the United States Bureau of Reclamation to have both engineering feasibility and economic justi-

fication when measured by the criteria established for considering a participating project. The irrigation water users can pay their annual operation, maintenance, and replacement costs and that portion of the reimbursable costs fixed by the ability of the farmers to pay. The costs allocated to power and municipal water will be paid out with interest at $2\frac{1}{2}$ percent in 50 years. The revenues from the Colorado River storage project, after repayment of storage project costs with interest, will be available to pay that portion of the construction costs of irrigation facilities above the ability of the farmers to pay. The benefit-cost ratio of each of these projects is greater than one.

These projects will do more than bring into production new acres, provide supplemental water for acres now irrigated and provide power for industrial development. The new water will stabilize the agriculture of the State by increasing the number of late season crops that can be grown. It will increase the value of the fall, summer, and spring ranges which make up the greater portion of the State's area by making possible the production of more feed to carry the livestock through the winter. The new water and power will provide the basic elements for an expanding industrial development in the fields of ferrous and nonferrous metals, chemicals, fertilizers, carbons and hydrocarbons, and synthetic fuels.

From a military standpoint, these projects are important nationally. Central Utah already houses several large defense installations such as Army supply depot, Naval supply depot, Desert chemical depot, Tooele ordnance depot, Ogden Arsenal, and Hill Air Force Base. The entire economy of Utah and its ability to help maintain a strong, strategically located source of military supplies is dependent upon adequate water and power.

The initial plan on the Colorado River storage project and its participating projects in Utah, as set forth in SB-1555 now under consideration, will, upon authorization and ultimate construction, provide for the initial stages of the development of Utah's remaining water, land, raw materials, and power resources. This project has the full and complete endorsement of the people of Utah.

This endorsement consists of a resolution passed by the Utah State Legislature, in special session in December of 1953, a copy of which is herewith submitted for the record, a letter from J. Bracken Lee, Governor of the State of Utah, directed to this honorable body, through its chairman, and statements from substantial and representative citizens and groups of citizens of the State who have over many years, been connected with the development of the State's resources, and who express the thinking of a broad cross section of the people of Utah.

More than 259 letters, statements and resolutions endorsing this project and urging its authorization have been received from individuals; water users association (18); county commissions (19); cities and towns (26); industrial groups (11); labor unions (3); civic clubs (33); women's clubs (36); chambers of commerce (13); junior chambers of commerce (8); educational institutions (5); county political committees (7); American Legion, professional engineers, wildlife groups (7); cattle and horse growers associations, wool growers associations, soil conservation districts, broadcasting companies (6); financial institutions, canning crop associations, farm bureaus, farmers unions and parent-teacher associations. These en-

dorsements represent, conservatively, more than 600,000 people of the State of Utah.

I wish to quote briefly from a typical letter from a group of water users under the proposed Gooseberry project :

The limitations on agriculture on which we in this valley depend, are imposed by direct flow irrigation of our agricultural lands from a short steep watershed. The spring and early summer are bounteous with precipitation and streamflow from melting snows but midsummer finds the farmers in an annual drought. The farmers have made the capital investment in the purchase of their farms, machinery, equipment and livestock with which to operate them but the most vital resource and ingredient of his farm operation (water) decreases rapidly as late summer approaches and his crops dry up and die. The visions of the spring evaporate as does the midsummer moisture, bringing failure to late crops and disappointment and economic loss to the operators.

Our last and only hope is the transmountain diversion of storage water from the Colorado River drainage to our valley. We have acquired all the other facilities for a well-rounded agricultural operation and the addition of late season irrigation water would make farming within the project area a profitable, going concern. It would stabilize the economy of the people, provide an occupation for our young folks and induce the return of many of our people who are maintaining vacant homes here in hopes that some day they may live again in this valley.

The 12,000 acre-feet average annual yield of the Gooseberry Reservoir would provide a supplemental water supply for irrigation during the latter half of the summer. Immediate effect of the project would be to double the amount of forage available for livestock which is the base of our agriculture. It would result in a more intensive feeding of sheep and cattle and a better grade of product. Dairying would be expanded with more forage crops from irrigated lands and poultry and hog production would be increased. The result would be an increased annual income in excess of the increased annual costs of the project. This increased agricultural production would contribute to the volume of wholesale and retail business transactions and transportation in the immediate area as well as in distant regions. Added feed and forage in the valley would make possible a more complete utilization of the range lands surrounding the project area and would aid in stabilizing the livestock industry during periods of drought.

This petition stems from a vital need. It is not an idle dream. It is the voice of a community in a mortal struggle for existence. We love our homes in the valley where we live, our desires are only that we shall be able to maintain ourselves in a respectable manner, give our children approximately the same opportunities which America hopes to provide for all of its citizens. Your earnest efforts in our behalf will be greatly appreciated. If you desire, you may read or file this letter at the hearing before the congressional committees considering the Colorado River development and the central Utah projects.

The water users of the State have endorsed this project as evidenced by the following resolution :

Now, therefore, be it resolved, That the Utah Water Users Association, speaking for the water users of our State and in the interests of the development of the water and mineral resources of the State of Utah, believes that the authorization of the Colorado River storage project and its participating projects by the passage of Senate bill 1555 will be in the State and national interest, and this bill is hereby fully and completely endorsed by this organization.

The following quotation is from a letter from Dean Carl J. Christensen, College of Mines and Mineral Industries, University of Utah, expressing the feelings of the people of Utah with respect to conservation of its resources :

A word as to conservation, to me the term "conservation of natural resources" implies the most beneficial use of these resources for rapidly expanding national and world population. Not to develop the upper Colorado River in manner outlined by the Bureau of Reclamation is to waste (fail to conserve) a tremendous natural resource of water and power potential which could be a benefit to thousands every day. All this would be lost so a dozen or so citizens yearly might enjoy a ride in a rubber liferaft over dangerous rapids in a river running between sheer raw walls of barren rock. For true conservation and for the best interests of a rapidly developing and growing nation, we must have a sound

engineering development of the upper Colorado River. This the Colorado River storage project and participating projects will provide.

The proposal before the committee, Senate bill 1555, seeks to authorize specific initial units of the Colorado River storage project and its participating projects. It proposes that the storage project and its participating projects be treated and accounted for as one project. This proposal is based upon the results of many years of detailed investigations by competent engineers in the Bureau of Reclamation and is set forth in Report No. 4-8a.81-2 dated December 1950, supplemented by a number of revisions and special reports.

The sole purpose of the proposed development is:

(a) To provide such storage on the main stem of the river as necessary to regulate the runoff at Lee Ferry so that the upper basin States may use fully and consumptively the 7½ million acre-feet per annum allocated to it by article 3 (a) of the Colorado River compact and at the same time assure that under article 3 (d) of the Colorado River compact the flow of the Colorado River at Lee Ferry would not be depleted below 75 million acre-feet in any 10 consecutive years. The purpose of the main stem reservoirs on the Colorado River is to provide river regulation, silt storage, power generation and irrigation water by exchange. It is true that no water will be diverted directly out of Glen Canyon for irrigation purposes in the upper basin. Water may be diverted directly out of Echo Park Reservoir. Both, however, serve as irrigation reservoirs by exchange. The waters which are used in the Imperial Valley, for example, come largely from the upper basin. It is quite likely that any one acre-foot of water used in the Imperial Valley may have originated in the Uintah Mountain of Utah. That acre-foot of water may belong to the Imperial Valley or some other irrigation district in the lower basin. If that acre-foot of water should be diverted and transported to Salt Lake Valley, it would no longer be available to the irrigation district in the lower basin. Before this acre-foot of water can rightfully be diverted to Salt Lake Valley, it would have to be replaced by an acre-foot of water from some other source. Such replacement would be provided from the water in storage on the main stem of the river. Therefore, the proposed storage reservoirs, Glen Canyon and Echo Park, and in the ultimate phase other reservoirs are essential to the irrigation of land in the upper basin, because without such storage the upper basin States could not meet their commitments to the lower basin at Lee Ferry as fixed by the Colorado compact and at the same time use consumptively the waters allocated to the upper basin by the same compact.

(b) To provide local storage, conveyance and control works necessary to deliver water, either directly or by exchange, for irrigation, domestic and industrial purposes, to the land and facilities to be served in the upper basin States.

(c) To provide power generation capacity and transmission systems to load centers as a part of the storage and participating projects, the revenues from which, after the cost of such facilities has been paid back with interest, would be used to pay the cost of the irrigation works over and above the ability of the irrigation farmers to pay. The power features of the Colorado River storage project and its participating projects are a means to an end and not the end in itself. It has long been the policy of the Reclamation Bureau to develop the power features of all irrigation projects. The primary purpose of this project is to make water available for beneficial consumptive uses

in the upper basin States from the Colorado River system. All other benefits resulting therefrom, be they large or small, are incidental to it. Power from hydroelectric plants is one of those benefits. This power, in addition to its value as a source of energy urgently needed for the development of the material resources of the upper basin, will provide revenues which are essential to pay for the indirect public benefits which cannot and should not be paid for by the direct users of the water. Therefore, the power features of this project are closely related to and a necessary part of the irrigation features.

The use of power revenues to pay off a portion of the irrigation costs is not a subsidy to irrigation. There are many indirect benefits to citizens in both the local and State, and the national areas. Property values increase where agriculture is stabilized. Business improves when the farmers are making money. The tax base is broadened and industries and services are established in prosperous agricultural communities. It is the accepted national policy that reclamation projects be supported with interest free money for construction because of the indirect benefits accruing to the general public at all levels. The water users and the indirect beneficiaries from an irrigation project are the same people. Therefore, the use of power revenues to pay for indirect benefits is not a subsidy but an equitable method of assessing indirect beneficiaries for their share of the cost of the irrigation works. Interest free money for irrigation works is no more a subsidy than the use of Federal funds for flood control or river and harbor improvement, none of which costs are ever repaid. The use of power revenues to pay costs of irrigation works above the ability of the water users to pay is not a subsidy and this money does not come out of the taxpayers' pocket. It is compensation for the use of the water belonging to the upper basin States for the purpose of producing power. The upper basin States are the owners of the right to use the water allocated to them by the Colorado River compact for all beneficial purposes, including power. It, therefore, follows that if these waters are used to make hydropower, the upper basin States are entitled to compensation for such use. The upper basin States are not asking for all the revenues from this use but only sufficient to pay a portion of the irrigation costs. The power revenues from this project will be sufficient to pay the cost of power facilities with interest and the cost of irrigation facilities, without interest, over and above the ability of the irrigators to pay in a period of 50 years. After that time the recurring water will produce power revenues in addition to the annual cost of operation, maintenance, and replacement of \$15 to \$20 million a year which will pour into the Public Treasury.

Recently the Congress passed the Tidelands Act giving to the States the oil found in the States' tidelands. Oil is a form of energy. Falling water is a form of energy. If the oil in Texas' tidelands belongs to Texas, by the same reasoning, the energy from falling water in Utah belongs to Utah.

Agriculture is the foundation of our national economy. Without sound agriculture, nations perish. Population pressures are already crowding the ability of this country to produce the necessary food and fiber to meet its demands. The arid West and particularly the Colorado River Basin, is limited to arable land resources and water supplies. It is mandatory that all of the arable land in this country be

brought into production. To bring the remaining arable land and the water supplies in the Colorado River Basin States together is a costly undertaking which will require a long period of time. This project, however, is fully justified as an irrigation project because it will bring together good land and firm water supplies which, if properly managed, will produce food and fiber for the generations to come. In addition, this project will provide necessary water for domestic and industrial purposes in a growing and rapidly expanding economy well supplied with vast quantities of raw materials.

Engineering investigations and studies have been made on the Colorado River for more than 40 years. Since the completion of the Boulder Dam, \$500,000 annually in power revenues, together with contributions from the various States, have been used by the Bureau of Reclamation to make detailed investigations of reservoir sites, dam sites, water supplies, conveyance and control structures, water requirements, arable lands, cropping systems, power potentials and requirements, municipal and industrial needs, and costs. Hydrologic studies have been made of water requirements and uses. Historic and virgin flows at Lee Ferry and other key points have been determined and currently measurements of both quantity and quality of flow are being made by the United States Geological Survey at many points on the main stem and the tributaries of the Colorado River. These studies have been directed toward a specific objective, namely the determination of development potentials and the works required to permit the development of such potentials within the limits of the Colorado River compact. Out of these investigations has come the proposed Colorado River storage project and participating projects, a valid and consistent proposal which, when carried out, will provide for the beneficial consumptive use of 7½ million acre-feet of water annually in the upper basin and at the same time meet the Lee Ferry requirements as set forth in the Colorado River compact.

Specifically, with respect to Utah, the development of its remaining land and raw material resources is absolutely dependent upon an increased supply of regulated and controlled water for irrigation, municipal, industrial, and other miscellaneous uses and on a greatly increased supply of electrical energy. The central Utah (initial phase), Gooseberry, and Emery County participating projects will provide the water and power needed at a cost significantly below the value of the benefits. The construction of these projects, together with the Echo Park and Glen Canyon Dams for river regulation, sediment control, and power, will provide the only practical means of securing a substantial quantity of new water and power urgently needed in the State and the only means by which the State of Utah can make beneficial consumptive use of its share of the water and power resources of the upper Colorado River Basin.

The Colorado River storage project and its participating projects is a valid, feasible, and urgently needed project. It will take 25 to 30 years to complete the initial phases and 75 to 100 years to complete the ultimate phases. It will provide for the full and complete utilization of the water and power resources of the Colorado River. It is self-liquidating and water, being a recurring resource, will yield net revenues to the public in perpetuity. It means a hundred years of steady, consistent growth. It means opportunity for the people in the upper basin States and is an investment in the future for the region and the Nation.

The Colorado River is a renewable resource, both water and power, worth literally billions to those who establish rights to its use. Water runs downhill and prevention of use, by any means whatsoever, upstream automatically gives that water and power to the users in the lower basin. Unless the upper basin States can put their share of water to use, either consumptively or for generating power, and the Colorado River storage project and participating project is absolutely essential to this end, the Colorado River compact will not protect them indefinitely in their rights to a portion of the waters of the Colorado River.

Failure to authorize the upper Colorado River storage project and its participating projects is tantamount to giving away the resources of the upper Colorado Basin States to the States of the lower Colorado River Basin and Mexico.

Mr. CLYDE. Utah is 1 of the 4 upper division States as defined by the Colorado River compact of 1922. The only source of water in these States is the precipitation which falls upon them. That water is essential to human, animal, and plant life and basic to the welfare of these States. It is necessary to public health. It is required for the processing of raw materials. These are all consumptive uses and for such uses there is absolutely no substitute for water.

Approximately 90 percent of the flow of the entire Colorado River system originates in the upper basin States and lacking facilities for river control and use, this flow, except for some 2 million acre-feet annually, now consumptively used in the upper basin, discharges into the lower basin and a considerable amount passes unused into the Pacific Ocean.

River controls at the Hoover, Parker, and Davis Dams have reduced floods and provided water and power for irrigation, municipal, and industrial purposes, all of which have made possible economic growth in the lower basin unparalleled in the history of our country. The upper basin States, with their enormous agricultural and industrial possibilities, can never fully develop until facilities for the control and use of the water and power in the upper Colorado River Basin, to which they are entitled under the Colorado River compact, are made available to them. It is no exaggeration to say that the future of the upper basin States—Utah, Colorado, Wyoming, New Mexico, and Arizona—is dependent upon the beneficial consumptive use of the waters allocated to them under the Colorado River compact from their last water hole, the upper Colorado River.

Irrigation agriculture, as an industry, was born in Utah and has played a major role in the development of the State and the West. Agriculture is the basic industry in the State in spite of the fact that only about 6 percent of the State's area is arable and 3.2 percent now cropped. Utah's agriculture is characterized by the production of general farm crops, fruits and vegetables for canning, and sugar beets. It is intimately tied up with livestock, dairying, and poultry production. It is the irrigated area in Utah that makes it possible to utilize the large areas of range and forest lands for grazing purposes. The crops produced in Utah are not in competition with the major crops of the Nation. Except for fruits, vegetables, canning crops, and sugar beets, the crops are harvested largely through livestock.

Although Utah's arable land area is limited, the lack of water is the real bar to its future growth. Utah's principal source of water is the

snow which accumulates on the high watersheds. Runoff from snow-fed streams does not coincide with irrigation or power demands. On streams not regulated by storage, most irrigation water supplies are exhausted by midsummer. In Utah, in spite of considerable development of storage, more than 60 percent of the currently irrigated land suffers severe water shortages annually. In total, there is ample water in the State of Utah to satisfy reasonably well its municipal, agricultural, and industrial needs but this water is not available in the right amounts, at the right time, or in the right place.

In order for Utah to utilize consumptively its share of the waters of the Colorado River, which amounts to 1,714,000 acre-feet annually, these waters must first be controlled by storage and then conveyed from the points of storage to the points of use. This means that storage for regulation, irrigation water by exchange, and power must be provided on the main stem of the Colorado River and that water from its high tributaries be diverted and conveyed by gravity across the mountains to the Bonneville Basin. There is ample water within Utah's share of the Colorado River to satisfy all of the needs of the Colorado drainage area in Utah and to provide water for trans-mountain diversion to the Bonneville Basin.

Utah is a vast storehouse of raw materials, both metallic and non-metallic. It contains basic materials for a great chemical industry. It has major supplies of coal, oil, shale, ferrous and nonferrous minerals, oil and gas, sand and gravel, limestone, and salt. It lacks adequate supplies of water and low-cost power with which to process them.

Utah's power market, consisting of rural farm, city and urban residential, commercial, industrial, and special requirements, is growing rapidly. An analysis of future power requirements in Utah shows that by 1970 the Utah power market alone could absorb nearly the entire power output of Echo Park and Glen Canyon powerplants. An analysis of the water requirements for industrial development and related domestic and municipal uses shows a potential use by 1970 of 200,000 acre-feet annually.

Utah's participating projects, as set forth in the bill which is the subject of this hearing, are:

1. Central Utah (initial phase).
2. Gooseberry.
3. Emery County.

The central Utah project will provide a full water supply for 28,540 acres of new land and a supplemental supply for 131,840 acres of land which is now partially irrigated. It will provide 48,000 acre-feet of water annually for municipal and industrial purposes. These consumptive uses will deplete the flow of the Colorado River an estimated 189,000 acre-feet annually. The central Utah project will have 61,000 kilowatt installed electrical generating capacity and will generate 373 million kilowatt-hours annually. The estimated total cost of the project as of 1953 is \$231 million, of which \$6 million is non-reimbursable. Of this total, power will repay \$47 million, municipal water will repay \$45 million, and \$127 million will be charged to irrigation.

Of this, the water users will repay \$15 million and the balance will come from power revenues from the Echo and Glen Canyon power-

plants. The power, municipal, and irrigation allocations will be paid out within 50 years. This project will provide for flood protection and water and power for agricultural and municipal uses and for the rapidly growing iron, steel, metal alloy, chemical, and fertilizer industries in Utah.

The Gooseberry project located in central Utah consists of a storage reservoir on the Price River, a tributary to the Colorado, and a transmountain diversion tunnel to the San Pitch River, a tributary to the Sevier River in the Bonneville Basin. The Sanpete Valley which is supplied with water from the San Pitch River, is an established agricultural area.

Its agricultural production, however, is limited to subsistence by annual water shortages. These annual water shortages will be practically eliminated on 16,400 acres of land by the construction of this project which will provide supplemental water for this area and stabilize its agriculture.

The Emery County project is located in the Colorado River Basin and is similar to the Gooseberry in that it will provide a supplemental supply of water to an established agriculture area, except that in the Emery County project some new land will be included. The project consists of a storage reservoir, a diversion dam, and a main canal to distribute the storage water to the existing irrigation companies. The Emery County project will provide a supplemental water supply for 20,450 acres of land and a full supply for 3,630 acres. This additional water will expand the agriculture of the area through the introduction of late-season crops and stabilize both the production of forage and the livestock industry which is dependent on it.

These projects have been shown by the United States Bureau of Reclamation to have both engineering feasibility and economic justification when measured by the criteria established for considering a participating project. The irrigation water users can pay their annual operation, maintenance, and replacement costs and that portion of the reimbursable costs fixed by the ability of the farmers to pay. The costs allocated to power and municipal water will be paid out with interest at 2½ percent in 50 years. The revenues from the Colorado River storage project, after repayment of storage project costs with interest, will be available to pay that portion of the construction costs of irrigation facilities above the ability of the farmers to pay. The benefit-cost ratio of each of these projects is greater than one.

These projects will do more than bring into production new acres, provide supplemental water for acres now irrigated, and provide power for industrial development. The new water will stabilize the agriculture of the State by increasing the number of late season crops that can be grown.

Senator MILLIKIN. Could I interrupt you? Tell us the mechanics of how you are going to get this water, and using it the right way. Tell us the mechanics of it.

Mr. CLYDE. The mechanics, Mr. Chairman, of putting the water to use under these three projects are these:

First of all, the central Utah project is dependent upon river regulation by storage in order that Utah may meet its share of the commitment to the lower basin as fixed by the Colorado River compact of 1922.

Senator MILLIKIN. Tell us in ordinary language where do you get your water, how does it get into the area, how does it get out of there, so we have a visual picture of what your water situation is.

Mr. CLYDE. The water will be stored in Glen Canyon and Echo Park Reservoirs to provide the water necessary to meet those commitments. The water that will be used in the great basin portion of the central Utah project will be secured from the streams draining the south slope of the Uintah Mountains.

Senator MILLIKIN. Is there a map that illustrates this? If so, let's get it up. I do not want to disturb your talk.

Mr. CLYDE. May I step to the map, Mr. Chairman?

Senator MILLIKIN. Please do.

Mr. CLYDE. Mr. Chairman, this range of mountains represents the Uintah Mountains. These run east and west. The streams draining the south side of that range are producers of large quantities of water. The elevation of that range is as much as 13,000 feet in places. The water which is available for diversion to the Bonneville Basin comes from tributaries which are a part of the Colorado River system. The specific diversions for use in Utah are from the Green River and the Duchesne, one of its tributaries.

The central Utah project will provide the necessary facilities to get the water from the Colorado River to the Bonneville Basin where the lands and the industries are. This involves crossing the high Wasatch range, and to do that without pumping requires a rather unique project. The project is unique to this extent: It utilizes a reservoir located at the top of the Wasatch Mountains at an elevation of 7,500 feet. From that reservoir, a feeder canal is taken eastward across the south slope of the Uintah Mountains, at an elevation of between 8,000 and 9,000 feet, intercepting each of the streams draining the south slope of the Uintah Mountains, and at each point of interception the water is diverted into a feeder canal and conveyed to the Strawberry Reservoir, from which it is taken by tunnels into the Bonneville Basin via the Spanish Fork River.

Senator MILLIKIN. The Strawberry Reservoir?

Mr. CLYDE. The Strawberry Reservoir is between the Provo and Duchesne, on Route 40. The water to be collected by the feeder canal and would normally flow down the tributaries into the Duchesne River, thence, into the Green River, thence, into the Colorado River and on to the lower basin.

Before Utah can take its share of the water from the tributaries of the Colorado and divert it from the Colorado River Basin into the Bonneville Basin, it must replace that water with some other water because water rights below the points of diversion have been established and those rights must be recognized before Utah can take that water. Therefore, utilizing the principle of exchange, the proposed project would provide reservoirs on the main stem of the Colorado from which to supply this exchange water. The two reservoirs proposed in this bill are Glen Canyon and Echo Park.

No water from those two reservoirs in the initial stages will be diverted for irrigation directly or indirectly. But by exchange we will divert the waters from the tributaries in the high Uintahs and replace that water out of storage at Echo Park and Glen Canyon.

Senator MILLIKIN. People who are not familiar with irrigation matters do not understand this term "exchange." Explain that to us, please.

Mr. CLYDE. The principle of exchange is simply this: Let's take an acre-foot of water which originates above this canal.

Senator MILLIKIN. That is the water that would cover an acre of land 1 foot deep.

Mr. CLYDE. That is right. That is a unit of water. Recognizing that rights to the use of the water of the Colorado River have been established in the upper basin to the extent of about 2 million acre-feet now consumptively used and in the lower basin much larger quantities, we will say, for example, that down in the Imperial Valley there has been established a right to the use of an acre-foot of water originating in the high Uinta Mountains. That acre-foot of water, if undisturbed, may flow down through here and ultimately reach the heading into the Imperial Valley Canal. That acre-foot of water belongs to the Imperial Valley Irrigation District.

Now, before we can take that acre-foot of water and move it over here to the Bonneville Basin, we must replace that acre-foot of water and exchange for it another acre-foot of water which we will take out of Glen Canyon or out of Echo Park.

Senator MILLIKIN. That is a common procedure in the West, is it?

Mr. CLYDE. That is a common procedure, Mr. Chairman, which has been used in most of the irrigation projects. I might say that from here on out the development of irrigation projects will depend largely upon the principle of exchange.

Senator MILLIKIN. My own State has developed that to a very fine science. But there are a lot of people who are not familiar with it and who do not understand the process. I am grateful for your explanation.

Senator KUCHEL. In order that I may receive a little education on the theory of exchange, is that generally accepted as a practice which can be engaged in without any specific statutory authorization?

Mr. CLYDE. That certainly is a practice which is recognized. I am sure that there is no question on the validity of the exchange, so long as the quality and quantity of the water is equivalent.

Senator KUCHEL. That is what I was going to ask you next. In other words, in any application of exchange of water we must assume that the water is both quantitatively and qualitatively the same as that water which has been diverted originally.

Mr. CLYDE. That is right. You could not take good water and replace it with water which was not usable.

Senator KUCHEL. It would be your statement that in the development which you are describing, the quality and quantity of exchange water would be the same?

Mr. CLYDE. That principle is underlined in all exchanges.

Senator KUCHEL. And that is your statement in connection with this?

Mr. CLYDE. Yes.

Senator MILLIKIN. Does that mean that anyone in the down basin is entitled to water free of salinity caused by the successive use of the water? There is no principle in the West that makes you remove salinity as the water passes down the stream.

Mr. CLYDE. No, sir. I said equivalent water.

Senator KUCHEL. Equivalent water. So I may understand, when you use the word "quality," how do you define the word "quality" in the water?

Mr. CLYDE. It depends on the purpose for which it is used.

Senator KUCHEL. Assume that under the Colorado River compact you are using it for domestic as well as agricultural purposes. Would the quality be required in an exchange to be the same if it were to be used for domestic uses?

Mr. CLYDE. I would say that the quality, if it is a domestic use, the water would have to be suitable for domestic purposes. If it was for agricultural purposes, it would have to be suitable for agricultural purposes.

Senator KUCHEL. And can that distinction be carried into effect in the use to which the Colorado River water is placed in the lower basin States? That is to say, can you visualize a situation where in the lower basin, on an exchange which you are describing, some waters would be utilized for domestic consumption of the same quality that is diverted in the central Utah project, and other waters of a different quality than that used for domestic water but similar to the same quality of diverted water for agricultural purposes?

Mr. CLYDE. If it is used for that purpose. For example, Senator, water for agricultural purposes may contain 500 parts per million of salt or it may contain 800 parts. But they are both suitable.

Senator MILLIKIN. You take the water as it comes down stream?

Mr. CLYDE. That is right. As long as it is useful for the purpose for which it was designed.

Senator MILLIKIN. We use water sometimes, I suppose, maybe 3 or 4 times, reused.

Mr. CLYDE. That is right.

Senator MILLIKIN. And as you reuse it, you add to salinity. Naturally, as the water is used and reused and moves on down, it is not in its first state of pureness so far as salinity is concerned as it was when it melted off the mountain peaks. So you take the water as you get it, you do not have it cleaned up for you. You do not necessarily get the kind of water that you get when it melts off the mountain peak.

Mr. CLYDE. If that demand were made, Senator, I would consider it an unreasonable demand. That is the point I want to make. This is a matter of degree. Waters change from point to point on the river system. But they are useful throughout the entire length of the system.

Senator WATKINS. The water that is stored in Glen Canyon and Echo Park and these nine reservoirs that are part of the program for the upper Colorado storage is actually the surplus water that usually comes down in the spring of the year, is it not?

Mr. CLYDE. It is the high water flow.

Senator WATKINS. And it would be the high water that comes from the mountains?

Mr. CLYDE. It comes from the snow banks on the top of the mountains.

Senator WATKINS. The plan is that one part of the available water is to be taken over into central Utah and the other is to be stored when floodwaters are on?

Mr. CLYDE. That is right. Both waters come from the same source and same territory.

Senator KUCHEL. Have we adopted this principle in the waters of the Colorado River?

Mr. CLYDE. Wherever you make a transmountain diversion——

Senator ANDERSON. Big Thompson is an example; is it not?

Mr. CLYDE. Yes. Where you make the transmountain diversion, you adopt the principle of exchange.

Senator KUCHEL. That is being done today?

Mr. CLYDE. Yes.

Senator WATKINS. It was authorized by the law of Utah, as I remember it.

Mr. CLYDE. That is right. It was first started around Salt Lake City when the city preferred to have the waters from the Big Cottonwood Canyon coming off the mountain for municipal purposes and they in turn provided water out of Utah Lake for agricultural purposes. They took the water from the mountains and put it into the pipelines and took the water from the lake and put it to the irrigation uses.

Senator MILLIKIN. You could not run your arid States if you didn't have an exchange system?

Mr. CLYDE. That is right. You could never develop the water resources of the West unless you apply the principle of exchange because the Creator did not put the water at the right place at the right time in the right quantity. Man has to change those and convey that water from the point of origin to the point of use.

Senator KUCHEL. It would be your statement that under the provision of the Colorado River compact you have today and have had in the past the application of this theory of exchange of water?

Mr. CLYDE. Yes, sir.

Senator MILLIKIN. I think you have answered my question.

Senator WATKINS. One other question while you are there at the map. Where is the water under the central Utah project to be used?

Mr. CLYDE. Water under the central Utah project would be used in the Bonneville Basin south of Spanish Fork as far south as Nephi and north of Spanish Fork, again by exchange, in Salt Lake County. That exchange will be made by constructing a reservoir on the Provo River, which will take the water which formerly went into Utah Lake, and we will take the water out of the Colorado Basin and put it into Utah Lake, and in exchange for this water which we divert at Bates Reservoir, we use the water out of the Utah Lake that originally came down.

Senator WATKINS. That is a series of exchanges, is it not?

Mr. CLYDE. Yes. We go from place to place. The object is we use the water first at the highest elevation and work the water down the streams. We will get the fullest utilization of the resource when we develop it from the top instead of from the bottom. When we develop it first from the bottom, we tie up the resources and we cannot fully utilize those resources.

Senator WATKINS. With reference to the other diversions and lands to be irrigated, would you indicate where those will be?

Mr. CLYDE. In the Uintah Basin, the lands to be developed are in this vicinity above the Duchesne, and we will divert waters from the tributaries to the Duchesne.

Senator WATKINS. You have to have a series of exchanges to accomplish that purpose, do you not?

Mr. CLYDE. Yes. The rights are established in the lower portions. As we bring these lands in on the upper elevations, they being rights of later priority must establish rights to divert. In order to get the rights to divert from the formerly irrigated lands, they have to provide storage facilities here to replace the water which they divert.

Senator WATKINS. I think we would be interested in having inserted in the record at this time the smaller projects under the central Utah, since we are on that subject.

Mr. CLYDE. Do you want me to give those?

Starting over here at the Tyzack Reservoir, the Stanaker Reservoir, we come down to, I think it is, Starvation, although it is not listed, and the Vernal, upper Stillwater, Hanna, Current Creek, Strawberry, Works Hollow, Bates, Hobbs Creek, and Round Knoll.

Senator WATKINS. Is this the map showing the initial phase?

Mr. CLYDE. This shows the initial phase of the project.

Senator WATKINS. I think that is all at the moment.

Tell us about the power plants on the central Utah. You mentioned, as I remember, it would develop some 60,000 kilowatts.

Mr. CLYDE. 61,000 kilowatts of generated capacity. As the water comes out of the Strawberry Reservoir in tunnels, it drops through, I think, 5 power plants, a total of 2,600 feet. That water, when it goes through the powerplants, will so operate that the water runs through them the year-round. During the summertime that water will be diverted below the lowest powerplant for irrigation purposes, and during the wintertime it will be passed through those powerplants and into the holding reservoirs below the powerplants for storage for next season's operation.

Senator WATKINS. With that combination, you can use the water for irrigation and by a series of exchanges use the water for the power, too?

Mr. CLYDE. Yes, sir.

Senator WATKINS. The revenue from the power there will also contribute to the overall program for the entire basin, will it not?

Mr. CLYDE. Yes, sir.

Senator WATKINS. I would like you to point out, if you will, where the power users are. Who are the power users?

Mr. CLYDE. The power users under the central Utah project, Mr. Chairman, are essentially the water users. That is, the same people who use the water for industrial and municipal and power purposes are the same people who use the water for irrigation purposes. They are one and the same. Therefore, the use of these power revenues, the use of these power revenues from these powerplants provides a very equitable and satisfactory and fair method of assessing for indirect benefits which those people who don't have to live on the farms derive from the construction of these projects.

Senator WATKINS. That should answer effectively the statement that has been made "that the power users are subsidizing the water users." If they are one and the same people, they are subsidizing themselves.

Senator ANDERSON. May I break in there, Senator Watkins? Mr. Clyde, we have long known you as one of the outstanding engineers in this whole Rocky Mountain area, and I think your statement this morning has certainly given us some evidence of that. I appreciate the statements you have made on the transfer and exchange of water.

I appreciate very much the statement you just made with reference to the use of these power revenues, the fact that the people who are going to be using the power are the people who are also going to be living on these lands and profiting from the development of these areas. You visualize this as the development of a whole empire, do you not?

Mr. CLYDE. Yes, sir.

Senator ANDERSON. I think it is a very fine statement and I appreciate, Senator Watkins, your giving me a chance to pay tribute to Mr. Clyde, because he has been a sound thinker on these problems for a long time.

Senator WATKINS. For those who do not know you, Mr. Clyde, you ought to identify yourself. Tell us about your background and training and experience you have had in this field.

Senator MILLIKIN. I am going to turn this over now to Senator Watkins.

I know something of your training and background, so you will excuse me if I leave for a short time.

Senator WATKINS (presiding). All right, proceed.

Mr. CLYDE. Mr. Chairman, I was raised on an irrigated farm. I have often said I was born with a lantern in one hand and a shovel in the other. Subsequent to that, I was trained as an irrigation engineer, with a degree in both civil and agricultural engineering, and for some 23 years I was on the engineering staff of the Utah State Agricultural College, 10 years of which I was dean of engineering. Subsequent to that time I spent 8 years as Chief of the Division of Irrigation Research in the Soil Conservation Service and became quite familiar with most of the irrigated lands in the western half of the United States.

Senator WATKINS. What was the nature of the work you did in that Department of Agriculture position?

Mr. CLYDE. During that time I was responsible for the development of ways and means of increasing the efficiency and use of the irrigation water supplies. As a part of that program, I was responsible for the development of the streamflow forecasting program which had been accepted by the United States and many other countries throughout the world, forecasting water supplies based on snow surveys. It was through this activity that I became quite well acquainted with the hydrology of most of the streams in the western half of the United States. So I have been experienced both from the source of the water, the characteristics of flow, and the utilization of the water after it gets into the valley.

Senator WATKINS. In your main statement back several paragraphs from where you left off, you said that the Utah area would be able to consume, in so many years, all of the power from Glen Canyon and Echo Park.

Mr. CLYDE. Yes, sir.

Senator WATKINS. How can you justify that?

Mr. CLYDE. Mr. Senator, Utah is a storehouse of raw materials; coal, which is the basis of a great petro-chemical industry, oil, and gas.

The greatest reserves of phosphates in the entire country and possibly the world lie in Colorado, Wyoming, Utah, and Idaho. There

is uranium, which is found on the Colorado Plateau, which will make its mark in our future welfare.

Salt, which again is a requirement for the chemical industry. Lime—we have everything to develop this great industrial empire in these upper basin States except water and power, and without those two, these materials will either remain in the mountains where they now lie or they will be dug out and transported in their raw form to other centers for processing.

We believe that we should have the right to develop these power and water resources so that we can develop these industrial resources and provide for the human resources which come along with it. These States for a long time have been feeder States. They have sent out their raw materials, and they have sent out their children who had no place to work.

They have had to go to States other than their own States to find employment.

I want to say, Mr. Senator from California, that we have, I think, from Utah two or three hundred thousand people in the Los Angeles area.

Senator KUCHEL. Mr. Clyde, you have, and they are good people, and I am sure that all the people in California are interested in seeing this whole country developed. There sometimes come into discussions like this recriminations that I want to have no part of. I think in my home in California, when I turn on the spigot, and draw myself a glass of water, that water came from some place along the Colorado River. I must say as a citizen who lives in that fine State, I am glad that we entered into this compact many years ago.

I think I have a responsibility here to endeavor to have a professional man like yourself testify into the record with respect to this question of exchanges and of equality of water because, obviously, you or I in turning on a hydrant some place 5 years or 10 years from now would want to be assured that that water was just as good to drink as the water that I drink when I am out there today.

Under all those circumstances, I am asking for your professional information with respect to those questions of quality. If I may just ask a question of two, in the exchange—

Senator WATKINS. Senator, could you wait a moment until he finishes the explanation about the power?

Senator KUCHEL. Surely.

Senator WATKINS. Mr. Clyde, you have not mentioned yet the non-ferrous and ferrous metals in the State of Utah. You mentioned chemicals. What about the copper and lead and zinc, and so forth?

Mr. CLYDE. The great deposits of iron in Utah which are now being processed by the Columbia and United States Steel Cos., the great deposits of coal which are necessary to that processing and the great deposits of lime which are also necessary are all there. They, too, lack water and lack power. Then we come to the copper industry.

The greatest open pit copper mine in the world is in Utah. We have only scratched the surface. We need power and we need water.

Senator WATKINS. At the present time, we ship copper to the New England States, clear across the country to be refined and also to be made into various alloys, do we not?

Mr. CLYDE. That is my understanding.

Senator WATKINS. Much of it goes to New England as I recall. If we had the power we could probably have some of those industries in Utah. Does the need for this power have any relationship, in your mind, to the defense of the United States?

Explain how the development in Utah, Colorado, and the other Intermountain States would be of benefit to the whole Nation.

Mr. CLYDE. Mr. Chairman, the situation which this Nation faces today, which I am sure all of you men are more familiar with than I, is terrifying, because first, most people live in centers of population. They are concentrated closely together, New York, Philadelphia, Chicago, Los Angeles, San Francisco, Seattle, and they are vulnerable.

I believe I read recently a statement by one of those interested in the atomic situation that the only defense against the H-bomb is evacuation. Where are we going to evacuate these people to? Two things are required in an evacuation, and the first one is water. You cannot move people without water. I happen to have been connected with a research program in the Imperial Valley recently, and as a part of our program we were studying the underground water conditions there and tabulating, locating, and characterizing all of the wells in the desert area around and east of the Imperial Valley. The Office of Civil Defense asked us to provide them with all of that information because they were locating every source of water supply in that entire desert area in anticipation of the necessity of having to move people. Water is extremely important. And power is essential because, if our industrial centers which are now located largely in the heavily populated areas were ever destroyed, this country would go down unless we could fall back to the mountains. We should be getting our industries decentralized.

The basis of those industries is power and water. Therefore, if for no other reason, the upper Colorado River should be developed to its full extent and it should be developed now. We should not wait another day because it will take 50 years to get that thing into use.

Senator WATKINS. That is all of it?

Mr. CLYDE. All of it.

Senator WATKINS. But there could be immediate results of a program is undertaken now?

Mr. CLYDE. If we start now and progress as rapidly as we can, it will take 20 to 30 years to cover the initial phases of this proposal, and from 75 to 100 years to completely develop the basin. So it is mandatory, imperative, that we develop these resources from a standpoint of national defense, if for no other reason.

Senator ANDERSON. Isn't it important that we continue to regard this as a multiple, basinwide program, and not split it into small parts?

For example, you have testified about the projects within your own State. The people of Utah have a right to decide how they want to use this water. The Bureau of Reclamation has testified to the validity of those projects, and as you yourself know, they will be valid. Therefore, we in New Mexico are just as interested in your project as we can be, because it is a basinwide development. Do you not so regard it?

Mr. CLYDE. Mr. Senator, it is absolutely imperative that this project be developed as a basinwide project. This river is a unique river,

a wild river. It is a river which up until 25 years ago successfully defied the efforts of man to control it. It was not until we put the concrete plug in at Hoover Dam that we successfully controlled the river. We cannot do this piecemeal. We have to establish the cornerstones, build the foundations, and then we have to put all of the appurtenant structures with it to get a full and complete development of the river, and it must be done as a basinwide program.

Senator ANDERSON. Do I not understand that the Senate bill as presented by Senator Millikin and others of us was decided upon by the State commissioners as their idea what a basinwide development should be?

Mr. CLYDE. Yes, sir.

Senator WATKINS. You brought a thought to my mind with respect to our friends in California, who mentioned that civil defense was investigating the source of water supplies outside of the cities.

It seems to me in connection with what you have just said that our friends in California and along the coast might want a very fine place to which to retire in the event of trouble in this country. I cannot think of any better place than to the mountain States. If you don't get these projects going, there will be no such opportunity, because of the lack of facilities to take care of the people. It ought to be in their interest. They ought to be interested in having this very development take place as a safety factor.

Any further questions?

Senator ANDERSON. I again want to congratulate Mr. Clyde on that fine statement. It is very encouraging to all of us, with your stature and great reputation in the West, to have you give solid support to this whole program.

I have, as you noticed, tried to be sure that some New Mexico projects were included, because I want to be sure that it is developed on a basinwide basis.

Senator WATKINS. Senator Kuchel?

Senator KUCHEL. Mr. Clyde, where has the exchange of water taken place in the past in the areas served by the Colorado River?

Mr. CLYDE. Mr. Chairman, my first knowledge was on the Strawberry project. My home was on that project.

Senator WATKINS. Where is that located?

Mr. CLYDE. That is near Springville, Utah, between Spanish Fork and Springville. Our firm water supply and our prior right came from another source, but we were in a position where we could use Strawberry water. The people up above us used our water and replacement water was provided from the Strawberry River via Spanish Fork Canyon, the Mapleton lateral, from which the water discharged into Hobbie Creek above our diversion point.

Senator WATKINS. That Strawberry Reservoir that you are speaking of is located in the Colorado River Basin is it not?

Mr. CLYDE. That is right. The Strawberry Reservoir holds water diverted out of the Strawberry River into the reservoir through a tunnel, into the Bonneville Basin. The Strawberry River is part of the Colorado River System.

Senator KUCHEL. Since the Colorado River compact was entered into in 1922 and then approved by the President in 1925, since that time has there been any exchange of water accomplished in the upper basin States?

Mr. CLYDE. In large quantities, no, because there have been no developments in the upper basin.

Senator KUCHEL. Would you say that this exchange of water is permissible under the Colorado River compact?

Mr. CLYDE. Yes, sir. The Colorado River compact is based on the principle of exchange because the Colorado River compact says that at Lee Ferry the upper basin State must deliver at that point 75 million acre-feet every 10 years. Some of those years the total flow at Lee Ferry is not equal to that. For example, in 1934, it was around 4.4 million acre-feet historic flow. They could not have supplied the rights of the lower basin that year even if they took the entire flow.

Senator KUCHEL. What was done in that year?

Mr. CLYDE. That was in 1934. You see, the river has not been fully developed. The upper basin States are entitled to half of 15 million feet and to date they have put to consumptive use only a little over 2 million acre-feet. So there is 5½ million feet, essentially, running wild and down the river simply because the facilities necessary for the development of that water and putting it to consumptive use have not been available.

Senator KUCHEL. In 1935, how much water was delivered at Lee Ferry?

Mr. CLYDE. In 1934 as I remember the figures, and I would have to check the records, there was 4.4 million acre-feet historic flow at Lee Ferry.

Senator KUCHEL. Where an exchange would be accomplished under this bill, have any studies been made professionally as to how the quality of the water was affected by those exchanges?

Mr. CLYDE. There have been some studies made by the Rubideau Laboratory at Riverside.

Other organizations have made measurements of the quality of water at various points along the Colorado. As I recall, in the geological survey records there were some records quite early in the century, a long time before any storage was put on the river. You will recall from the characteristics and flow of the Colorado River that at some seasons of the year, before any regulation was available, the flow at Yuma became very, very low and as it got very, very low the salt content increased very materially.

Senator KUCHEL. When it increased materially, or in any instance when it would increase materially, would that affect the quality of the water for domestic purposes?

Mr. CLYDE. They continued to use it for that purpose.

Senator KUCHEL. Its quality would be affected?

Mr. CLYDE. As you decrease the flow, you increase the percentage of salt content if the total quantity of salt remains the same.

Senator KUCHEL. But it is your statement that it would not so materially affect it as to injure its potential use?

Mr. CLYDE. I don't know of them ever having had, in the history of that country, to go outside of the valley to get water for their own use.

Senator KUCHEL. I am thinking now about what your testimony would be if this bill became the law and these various exchanges were required, as you have testified here would be required in the central Utah project, what your testimony would be then as respects the quality of water in the river at Lee Ferry.

Mr. CLYDE. You have to be governed by the facts, Mr. Senator, and it just happens that the salt concentration before river regulation during those periods was much higher than it has ever been since under regulation.

Senator KUCHEL. Will you explain that in a little more detail?

Mr. CLYDE. I say the salt concentration during the low periods of flow, before regulation, were much higher than the salt concentration has been at any time since.

Senator KUCHEL. Would it be much higher in your opinion under the bill if it became law?

Mr. CLYDE. It is purely an opinion now, because we don't have sufficient data to nail down what would happen 50 years from now. But the evidence that we do have indicates that the change will not be material under the development of this project.

Senator KUCHEL. It would then be your testimony that for 50 years there would be no problem with respect to—

Mr. CLYDE. I wouldn't limit it to 50 years. I would say that the development of the upper basin water supply will not materially affect the quality of the water.

Senator KUCHEL. Although you also say that no professional studies have been made of that problem?

Mr. CLYDE. I say that the record to date—they are making studies now, and studies should be continued. But the record to date does not disclose anything that would indicate that there will be a material change.

Senator KUCHEL. Suppose those studies were to indicate that there would be a substantial change in the quality of water. Would that affect your opinion as to this whole project?

Mr. CLYDE. If it destroyed the resource, it would have to affect my opinion.

Senator KUCHEL. Then I ask this question in complete good faith: Should not those studies be sufficiently carried on to permit any professional engineer, such as yourself, and chemists, and any other professional interest, to be able to testify clearly that there would be no problems with respect to the quality of water which finally would be used for domestic purposes in the lower basin States?

Mr. CLYDE. Do you mean by that that we should delay all action?

Senator KUCHEL. I am just asking for your thinking on it. I mean, it is a problem that occurs to me.

Mr. CLYDE. Mr. Senator, I believe in studies and investigations currently and continuously. I think we do not have enough knowledge to enable us to answer all of these questions, but we cannot wait for certainty. And as long as the way looks clear ahead, we should go ahead.

And as far as the quality of water goes in the Colorado River, based on all the evidence that I can find, on all the current studies that are being made, it is my humble conclusion that the development of the consumptive use allocated to the upper Colorado River Basin, under the Colorado River compact, will not materially affect the quality of the water at the lower basin. That is my humble opinion.

Senator KUCHEL. Could you supply for the hearings here the data which has been accumulated on the basis of studies so that it would be available to the committee?

Mr. CLYDE. I can supply that which I have, and I got it out of the Geological Survey published reports. We made no studies of our own. The only record I have is the record which comes from the Geological Survey reports, the quality of water division.

That is public information. I have taken that data. It is the only source. I am still searching for any possible clue as to what is going to happen, based on the record we have.

Senator KUCHEL. Is it your statement that those reports indicate a similar opinion by those professionals that the quality of water would not be materially changed?

Mr. CLYDE. I would not want to tell you what somebody else's opinion is. I want to speak for myself.

Senator KUCHEL. I would greatly appreciate it if we could have that from you to go into the record.

Senator ANDERSON. On that point could we go back to the testimony given by Mr. Jacobson of the Bureau of Reclamation before the House committee?

Senator KUCHEL. Where is that?

Senator ANDERSON. Pages 177 and 178. The Bureau estimates that the mean concentration of dissolved solids in the flow at Lee Ferry for a period 1931-47 approximates 0.78 of 1 ton per acre-foot, and they estimated that with the construction of Echo Park and Glen Canyon dams and the 12 participating projects that it would raise to approximately 0.87 of a ton per acre-foot, an increase of about 12 percent. Subsequently Mr. Larson estimated that San Juan-Chama might raise that 0.01 of a ton, so it became 0.88 of a ton. Then it was pointed out on a chart the Bureau used that the range for extremely good water is from zero to 7.5, that the permissive range is from 7.5 to 20, and since these waters we are talking about were between 8 and 9 they were at the top side of the permissive range.

Does that check with your judgment on the matter?

Mr. CLYDE. The top side?

Senator ANDERSON. The very best side of the permissive range. They are the best of water that would come within the permissive range. They are not near the 20 mark. They are close to the 7.5 mark which is extremely fine water, unusually fine water. Would that not agree with your judgment on the matter that with the construction of these projects, all of them included, it would add just a small amount per ton of solids and therefore would still leave it extremely fine water?

Mr. CLYDE. Yes, sir. I agree with that. But I would like to add some additional opinions which support my position. As I said before, we do not have enough measured data to support this. But the assumptions which were basic to those analyses, as I understand them, were a balanced salt inflow and outflow. That is the only assumption we can make in the absence of other data. But it is my firm belief that that assumption is not necessarily true, for the reason that as we control these waters we are not subjected annually to the flushing, both over the surface and through the ground, that we are now under uncontrolled conditions.

Therefore, there will not be the same amount of salt moved. Secondly, under controlled applications of water we will have less bleaching. When we consider that the total amount of land to which this water is applied in comparison with the total area of the surface, it

is so infinitesimally small that I don't believe that inflow-outflow balance of salt is necessarily true.

Senator ANDERSON. May I try to put it into a situation that I might understand. I can say that I had a field with quite a little black alkali in it. Since I wanted it out, I put unusual quantities of water on it and tried to wash it out. When I got it out, I tried to irrigate with a steady flow, because I didn't need the washing of leaching process. If you stop this washing process that you get by flood and put it on a regular flow, there will be less of that caused in the river.

Senator KUCHEL. Is that a generally accepted conclusion by qualified people that the Senator has just referred to? Is that generally accepted?

Senator ANDERSON. That was just an illustration.

Mr. CLYDE. Senator Kuchel, whenever water is applied artificially to the soil, that water carries a certain amount of salt with it, be it large or small, and if that water is kept within the root zone of the plant and not allowed to percolate below that root zone, but is either evaporated or transpired, sooner or later that soil column will fill up with salt, the fundamental proposition being that we must maintain in that soil column a salt balance. That is, we must take out through percolation at least as much as comes in, otherwise there would be an accumulation. That is fundamental.

My point is this, that under uncontrolled flow, we have to use the water when it is available, and we flush that water down in large quantities in those areas where storage is not available for control, and we flush any salt off the surface and in many cases we apply large quantities which go through the ground and leach out the salt from the soil.

Under regulated conditions, the applications are going to be smaller. We must increase the efficiency of use so as time goes on and as water becomes more scarce, we are going to use it more efficiently and we are going to use in the ultimate the minimum amount of water necessary to maintain that salt balance. That is one of the principal reasons why I believe that the conditions will get better with time rather than get worse.

Senator WATKINS. Mr. Clyde, as I remember, you said you were with the Agriculture Department in charge of irrigation research.

Mr. CLYDE. Yes, sir.

Senator WATKINS. And that was in how many States?

Mr. CLYDE. Seventeen.

Senator WATKINS. Seventeen?

Mr. CLYDE. Yes, sir.

Senator WATKINS. So that what you are saying now comes as a result of your experience for some 10 years in that particular research field?

Mr. CLYDE. Yes, sir.

Senator ANDERSON. Is it not true that those 17 States are the States to which the reclamation law applied, and every State where we were doing irrigation work?

Mr. CLYDE. Yes, sir.

Senator WATKINS. Mr. Clyde, I think you may resume your seat now and go on with your prepared statement.

Mr. CLYDE. Mr. Chairman, there may be some duplication, but I will read as follows:

It will increase the value of the fall, summer, and spring ranges which make up the greater portion of the State's area by making possible the production of more feed to carry the livestock through the winter. The new water and power will provide the basic elements for an expanding industrial development in the fields of ferrous and nonferrous metals, chemicals, fertilizers, carbons and hydrocarbons, and synthetic fuels.

The large population and industrial centers of the United States are vulnerable in case of an atomic attack. A second line of defense must be established to provide a haven for people and industrial capacity to support an all-out defense. The development of the inland resources of this country should receive major consideration for immediate development. Therefore, from a military standpoint, the Colorado River storage project and its participating projects is of major national importance.

Central Utah already houses several large defense installations such as the Army supply depot, the Naval supply depot, Deseret Chemical Depot, Tooele Ordnance Depot, the Ogden Arsenal, the Hill Air Force Base, and the Dugway Proving Grounds. Utah and Colorado are already the ranking uranium producing States. The entire economy of Utah and the upper basin States, and their ability to help maintain an evacuated people and a strong, strategically located source of military supplies is dependent upon adequate water and power. The projects proposed in the legislation before this body will provide for that water and power and for the development of the land and raw material resources of the area.

This project has the full and complete endorsement of the Governor, the State legislature, and the people of Utah as evidenced by resolutions from the legislature, public and private bodies, and individuals representing more than 600,000 people which were made a part of the record before the House committee.

In spite of the volumes written in opposition to the Colorado River storage project and its participating projects, the facts are well established relative to the basic features necessary for this basin-wide development. These facts simply stated are as follows:

1. The Colorado River is the last remaining water resource of the upper basin States—Utah, Colorado, Wyoming, New Mexico.

2. More than 90 percent of the water in the Colorado River system originates in the 4 upper basin States.

3. The waters of the Colorado River system were divided by compact in 1922 between the groups of States in the upper and lower basins. The Colorado River compact requires the upper basin States to deliver at Lee Ferry 75 million acre-feet of water during each consecutive 10-year period. This commitment cannot be met without complete regulation of the river above Lee Ferry if the upper basin States are to be allowed to use consumptively their share of the Colorado River.

4. In 1928 the Boulder Canyon Project Act was passed and subsequent to that time, the Hoover, Davis, and Parker Dams and powerplants and the All American Canal have been built. These powerplants are making power out of water that belongs to the upper basin

States under the compact because there are few facilities yet built in the upper basin which will permit the consumptive use of the upper basin's share of the water of the Colorado River.

5. Since 1922 practically no development has taken place in the upper Colorado River Basin. During the same period, California has been able to fully develop her full share of the Colorado River water.

6. Since about 1932, \$500,000 annually from power revenues has been available for conducting investigations in the upper basin. These investigations have been conducted by the United States Bureau of Reclamation in cooperation with the respective States.

7. In 1950 a proposal was made by the Bureau called the Colorado River storage project and participating projects, a basinwide proposal, which, if carried out, would provide the facilities necessary for the upper basin States to use their share of the Colorado River water. This proposal is unique but complicated and must be carried out as a single basinwide project.

Senator WATKINS. In your opinion, based on the vast training and experience you have had in this particular field, do you know of any other possible program that might be adopted which would make it possible for the upper basin States to get consumptive use of the waters which have been allotted to them?

Mr. CLYDE. Mr. Chairman, I have studied the reports, all of the reports, that have been made on the Colorado River since 1900. I am convinced that there is no other way in which the upper basin States can utilize their share of the waters allocated to them under the Colorado River compact from the Colorado River.

Senator WATKINS. It is either this or no program in your opinion?

Mr. CLYDE. That is right.

Senator WATKINS. And of course if there is no program, the people down below will get the water?

Mr. CLYDE. That is right.

Senator WATKINS. We can't object to them wanting to get it, but we want and need it also.

Mr. CLYDE. This project must and does provide for (a) complete regulation of the river at Lee Ferry, (b) power revenues, and (c) water for consumptive use by direct diversion both within and without the Colorado River Basin or by exchange.

9. The proposed Colorado River storage project and its participating projects (initial phase) is a valid, feasible, and urgently needed project which will cost about \$1 billion over a period of 25 to 30 years that it will take to construct it. It is self-liquidating and after full repayment of all costs, water being a recurring resource, will yield net revenues to the public in perpetuity amounting to 15 to 20 million dollars annually.

Senator ANDERSON. May I interrupt you to point out that the payment back to the Treasury and the public revenues are not the only benefits either. Senator Hayden has many times pointed out that in the Salt River project in Arizona, though it cost many millions of dollars, the project is repaying the Treasury all of the costs and in addition the people who live in it have paid for the project three times over in their income-tax payments.

By your example of how this would raise the general level of the economy in these Western States, they would not only pay out the

projects and perhaps pay 15 to 20 million dollars to the Treasury annually on top of that after it is paid for, but they would be paying heavier income taxes and contributing to the schools and so forth in the area.

Mr. CLYDE. Mr. Senator, the broadening of the tax base, together with the increased income taxes that would result, would justify the project alone. In other words, wherever we have good land and good water, and you can join them in such a way that the people who use them may pay annually, the operation and maintenance costs plus replacements necessary to keep that operation going in the perpetuity the first costs don't make any difference.

Senator ANDERSON. I am glad to have you say that, because I raised some questions the other day about assessing benefits. It isn't just the direct benefit to that land. The point I was trying to make and didn't make very well, was that it isn't just a question of whether there is an immediate benefit to the land of 500 or 1,000 dollars an acre. In time there will be that benefit, but in addition all through the life of the project there will be financial contributions to the Government, and those benefits must be measured as well as all the others that the Bureau of Reclamation so properly takes into consideration in calculating the benefits from that piece of land. But an improvement in the business conditions of the community and a great many other things are considered. I think one thing the Bureau of Reclamation has never calculated is the importance to the Bureau of Internal Revenue, but these income-tax payments from the irrigated lands make a tremendous contribution to the tax base in this country as well as the revenues that they produce. This is an asset for all of the people of the country. Otherwise, people might say "Why do we build it out in the West," even though we are entitled to it.

It is a tremendous asset to all the people in the country in the tax relief it gives. Isn't that your belief about it?

Mr. CLYDE. It is a national investment, Mr. Senator, that this country cannot afford to pass by.

Senator WATKINS. In connection with that, the water available for consumptive uses, makes electricity valuable. Without it, it would be worthless.

Mr. CLYDE. That is right. Mr. Chairman, in conclusion, I would like to make the following statement.

The Colorado River is a renewable resource, both water and power, worth literally millions to those who establish rights to its use. Water runs downhill and prevention of use upstream by any means whatsoever, automatically gives that water and power to the users in the lower basin. Failure to authorize the upper Colorado River storage project by Congress is tantamount to giving away the resources of the upper Colorado River Basin States to the States of the lower Colorado River Basin and Mexico. In the interest of fairness and the right of a people to develop its resources and as investment in the future of the West and the Nation, this project should be authorized immediately.

Senator WATKINS. I thank you very much, Mr. Clyde.

We have a witness who has to catch a 1:15 plane, Dr. J. LeRoy Kay, so we will call him.

**STATEMENT OF J. LeROY KAY, CURATOR OF VERTEBRATE
PALEONTOLOGY, CARNEGIE MUSEUM, PITTSBURGH, PA.**

Mr. KAY. Mr. Chairman and members of the committee, I am very grateful to you for calling me at this time so that I might catch my plane for Butte, Mont. I have commitments on the 1st with a party from Princeton University and one from the American Museum in New York to gather some data for the Geological Society of America. I cannot very well delay the arrival.

Senator WATKINS. You tell us who you are, I assume, in your statement.

Mr. KAY. I am J. LeRoy Kay, curator of vertebrate paleontology at the Carnegie Museum, in Pittsburgh, Pa. I spent 8 years excavating dinosaurs at the Dinosaur National Monument—1915-23—and several summers in the area since that time.

There has been considerable controversy in regard to the benefits and damage to the Dinosaur National Monument by the construction of Echo Park Dam within the confines of the monument. I have read with much interest the pros and cons of this controversy as I have a deep personal interest in the matter, having spent many years in the area as a paleontologist. During this time I visited by boat, horseback, and on foot most all of the present accessible places in the study of the natural history of the area.

In the early days of the controversy the opponents of the dam maintained that the backed-up waters would cover the dinosaur beds for which the monument was primarily established. This argument is no longer used as it is well known that the waters from the Echo Park Dam will not cover the dinosaur beds.

Senator WATKINS. How about the Split Mountain Dam? Will that cover them?

Mr. KAY. No. Now the argument seems to be that it will establish a precedent for invading other monuments and parks and will distract too much from the natural beauty of the area. The opponents suggest other dam sites to replace the one at Echo Park.

When the President, by proclamation, enlarged the original Dinosaur National Monument to take in the Green and Yampa River Canyons and adjacent areas, he reserved the right for the Reclamation Service to build a dam, called the Brown's Park Dam site, within the confines of the monument area. This dam site is on the Green River below Brown's Park and would flood the upper part of the canyon and Brown's Park. So, in building the Echo Park Dam it would only mean building it at a more strategic spot but in no way establishing more of a precedent than at the Brown's Park site. Actually, Reclamation has priority over monument rights in the area.

At the present time the only way to visit the canyons of the Green and Yampa Rivers is by boat and only by experienced river boatmen, so the only safe way for the tourist or vacationist to do this is to hire a boatman at considerable expense to take them through parts of the canyons, some parts not being safe for even an experienced boatman.

Senator WATKINS. May I ask you a question to qualify your testimony? Have you visited the Echo Park area?

Mr. KAY. Yes.

Senator WATKINS. More than once?

Mr. KAY. Many times.

Senator WATKINS. You were working in that area for how many years?

Mr. KAY. I was working there for 8 years steady and then I have been back nearly every summer since 1923.

Senator WATKINS. Are you a naturalist?

Mr. KAY. Yes.

Senator WATKINS. You may proceed.

Mr. KAY. It is true that trails, or even roads, could be constructed to the canyon rims where people could view the canyons at a distance but few would ever see many miles of the canyon walls close up where they could study the geological structures and fauna and flora, both living and extinct. A number of people have gone through the canyons of Lodore, Yampa, Whirlpool, and Split Mountain by boat and a few have lost their lives in the attempt. Which is the better judgment—to preserve these canyons as they are for a few daredevils to have the thrill of shooting the rapids or thousands of people visiting these canyons by boat on still water?

One only needs to compare the additional number of visitors that each year visit the areas of the Hoover Dam in Nevada, the Roosevelt Dam in Arizona, the Grand Coulee Dam in Washington, or the Fort Peck Dam in Montana, to mention a few, to see what the results will be at the Dinosaur National Monument if the Echo Park Dam is built.

The alternate dams proposed by the opponents of the Echo Park Dam would not control a considerable amount of tributary water which empties into the Green and Yampa Rivers between these and Echo Park Dam site. From a naturalist's standpoint, the rocks covered by the waters from the Echo Park Dam are of less importance than those that would be covered by the alternate dams. The waters from the Echo Park Dam would cover, for the most part, the lower section of the Lodore formation—a nonfossiliferous Paleozoic formation which occurs and is much more accessible outside the monument. The waters from the Cross Mountain and Brown's Park Dams would cover most of the Brown's Park formation, which is not known at any other place. Such vertebrate fossils as proboscideans, rhinoceroses, camels, and carnivores of Upper Miocene and Lower Miocene age have been collected from the Brown's Park formation.

Senator WATKINS. That is the site where it is claimed that the President reserved a right to build a reclamation dam is it not?

Mr. KAY. Yes.

Senator WATKINS. And where the opponents say they would not object to us now building a dam?

Mr. KAY. The opponents, yes, sir. Being the youngest consolidated sediments in the area the Brown's Park beds are an important key to the geological history of the area.

There are many unique natural resources in the upper Colorado drainage area which need electric power and water for development and some of these are strategic minerals.

Senator WATKINS. May I ask you this question: You heard the propositions for alternate dams. Suppose these alternates would be of equal value as far as the production of power and the saving of water is concerned to Echo Park. What would you, as a naturalist, do? Would you be willing to take the alternate dams or what would

be your judgment as to what should be done under those circumstances?

Mr. KAY. I would not take the alternate dams against the Echo Park Dam.

Senator WATKINS. Why?

Mr. KAY. Because the Echo Park Dam in my estimation is the only way, or dams within the park, to make traffic on still water for the many people that might visit the park possible, and the alternate dams outside the park would leave the tremendous burden on the national park service which they wouldn't be able to meet, they don't have enough money to build roads, trails, or in any other way make the area, which is a beautiful area, accessible to a great many people.

Senator WATKINS. You have been at the dam site proposed for Echo Park?

Mr. KAY. Yes.

Senator WATKINS. What would be the situation there or what would it look like—I suppose you can project your mind to cover the situation—if the water were 525 feet deep at that point? What would happen to the scenery there?

Mr. KAY. The water impounded there, I think, would be about 500 feet. The dam is something like 525 or 550 feet high. There would be about four-fifths of the canyons as they are now still above the water if you built the Echo Park Dam and dammed the water to 500 feet. It would take 500 feet away from way over 2,000 feet at the dam site. And as it went up the river it would keep lowering on account of the stream, until when you got to the upper reaches of the stream, there would be a smaller amount of water.

Senator WATKINS. And the Lodore Canyon?

Mr. KAY. It would be 50 feet or so.

Senator WATKINS. Describe the canyon walls above it at that point.

Mr. KAY. It would be more than 2,000 feet above the water. Probably about 2,500 feet.

Senator WATKINS. What is the condition of the canyon floor at the present time from the standpoint of the scenic value?

Mr. KAY. There is one place where, as I stated, the Lodore formation which the Echo Park Dam would cover is better developed outside the monument than it is within the monument. We know nothing about it. It is nonfossiliferous. It would not cover all of the Lodore formation. It would cover about a third of it. There would be two-thirds of it above the water for future geologists to study. But the importance of the history of the area is found in the rocks above that. As the rocks of the earth's crust have been upheaved into a fold, which caused the Uintah Mountains, and by the way the only large mountain in the Western Hemisphere that runs east and west, it has thrown those rocks up and the last rocks deposited, whether they have been tilted or whether they have not been tilted, whether there is an unconformity between those and the rocks below, is the key to the history of when all of this upheaval took place.

So the rocks of the Brown's Park beds which the alternate beds would cover, is the key rock to the geology of the area.

Senator WATKINS. In other words, they ought to be trying to protect Brown's Park area rather than Echo Park?

Mr. KAY. That is why if I had the say-so, I wouldn't take the alternate dams in preference to Echo Park or Cross Mountain dams.

Senator WATKINS. What vegetation grows on the canyon floor through the Echo Park area?

Mr. KAY. There are cottonwood all along the Colorado River. Along the sides there are some junipers, some bush brush, 1 or 2 berry bushes, like the buffalo berry bush, usually called the mulberry, and a few things like that.

Senator WATKINS. There are thousands of places in the West like that, are there not?

Mr. KAY. Yes, and within other parts of the monument that will not be covered by the water.

Senator WATKINS. What about the condition of the water through the area called Echo Park? I think that is a misnomer. I think it is a handicap the Reclamation has to overcome. The idea of many people is that Echo Park must be a park. That is just a geological name, it is not?

Mr. KAY. That is the name of that little area where the dam will be built.

Senator WATKINS. And was given to it by the first settlers, was it not?

Mr. KAY. Yes, given to it by the various first settlers. A lot of the area was named by Powell when he went down on his trip to the Colorado.

Senator WATKINS. What about the water with respect to carrying silt at that point?

Mr. KAY. Carrying silt? The USGS has been making estimates. I can remember when they were studying the silts in the water as far back as 1917. And they have been making studies since that time, about the silt. Of course any obstruction that you put in there will retard the silt carried down the river.

Senator WATKINS. There is a naturalist in my own State, named Mark Anderson of Provo, Utah, who was a great conservationist. He described the river at that point as belching red mud. Would that be a correct description of it?

Mr. KAY. The river at that point, for most all of the year, is very heavily silted, and especially during high water. It sort of rolls instead of flows. But later on it clears up some in low water but never entirely. It carries a lot of silt. Naturally any stream that is with a gradient that great will carry silt.

Senator WATKINS. You may proceed with your statement.

Mr. KAY. There are millions of tons of hydrocarbons such as Gilsonite, Wurtzilite, Nigrite, Tabbyite, Lusterite, Ozokerite.

That is the only place they are found in commercial quantities.

Senator WATKINS. You are talking about the area and not the canyon?

Mr. KAY. Most of those are found within a short distance of Echo Park.

Senator WATKINS. How far away?

Mr. KAY. As the crow flies, 15 or 20 miles.

Senator WATKINS. You are not indicating that any of these would be covered by water, are you?

Mr. KAY. No; they would not be covered by the water. It needs the water and the power for the development of those.

Senator WATKINS. They exist in the area 15 to 20 miles away from there?

Mr. KAY. Yes. Some of them are 75 miles away.

Senator ANDERSON. So that actually the construction of this dam will greatly assist in the development of strategic minerals?

Mr. KAY. It is the only way they can develop them. Not entirely because they need water for the milling of these, but they need water for the people who would develop them. I think my next statement will answer that.

It is estimated that at 1 place 800 million tons of bituminous sandstone occurs and there are many such outcrops of this material in the area. There are mountains of phosphate, iron, and large deposits of coal, copper, silver, lead zinc, uranium, et cetera. Aside from the electric power that is needed for the development of these resources many of the areas lack enough water for every culinary use, to say nothing of water for other uses for the development of these resources.

I think Senator Watkins knows that for many years some of those towns have been hauling water in tanks drawn by horses for culinary purposes, and now some of them are hauling it by truck. Now the water for drilling and so on is hauled by trucks, for great distances at great expense. Many of the towns have reached the peak of development due to the lack of water. The only practical way for many of these areas to acquire water for their future growth is from the development of the waters of the upper Colorado River.

It is estimated by the engineers of the United States Reclamation Service that the increased evaporation from the widespread waters of the alternate dams as against the narrow strips of water in the canyons from the Echo Park Dam would be considerable and while water is at a premium, why waste it for sentimental reasons.

Probably 1,000 people have visited parts of the canyon areas of Dinosaur National Monument since the National Park Service took over and by far the majority, from various nature groups, visited there last year so they could say, for argument's sake, they had visited the area.

It is true that flooding the bottoms of the Green and Yampa River Canyons will change their appearance to some extent but there will still be a minimum of four-fifths of the canyon walls above the water, which will distract very little from the beauty of the area that is so glowingly described by the opponents of Echo Park Dam. To me there seems only one practical way to make an attractive area of Dinosaur National Monument so that it can be safely visited by the greatest number of people and that is to cover the present rapids with still water for safe boating.

If there are a few who would like the thrills of shooting the rapids let them try going through the Cross and Split Mountain Canyons and if they survive they will have something to tell their grandchildren.

Of course, the cost of building these dams would be prohibitive for the development of the monument for its scenic and educational values alone, but so long as it is practical to build the dams for irrigation, power, and conservation of water, and the power will pay most of the cost, why not build the dams where they will do the most good?

Senator WATKINS. When you say the most good, to what do you refer?

Mr. KAY. The development of the Dinosaur National Monument as well as for power and water which the district needs.

Senator WATKINS. And for the purpose of making it available to the millions of people instead of a few thousand.

Mr. KAY. Millions instead of a few hundred. I might state that for the last 2 years I have been through the gates of the canyon north of Helena, Mont., in a boat. They built a dam at Wolf Creek, at the lower end of the canyon, and flooded it with about 50 to 75 feet of water. The canyons are less than one-third the height of what the canyons would be, say Whirlpool Canyon or Lodore and Yampa, if the dams are built in the park, and yet last year, on Sunday that I was there, there were more people that went down that canyon to view those walls which are a few hundred feet to maybe at the most a thousand feet high, there are more people that went on that Sunday than have gone through the Whirlpool, Yampa, and Lodore Canyons in its entire history and it wasn't built for that purpose.

I feel sure that the building of Echo Park Dam and Split Mountain Dam, and the relieving of the Dinosaur bones at the Dinosaur Quarry will make the Dinosaur National Monument one of the most outstanding attractions of our national parks and monuments, and that this can be accomplished in no other way.

Senator WATKINS. Any questions?

Thank you, Dr. Kay.

Senator Bennett wants to make a short statement and put some material into the record.

STATEMENT OF HON. WALLACE F. BENNETT, A UNITED STATES SENATOR FROM THE STATE OF UTAH

Senator BENNETT. Mr. Chairman, I have a statement of some 18 pages which I will not attempt to read, but there are one or two references I would like to make to it. I hope members of the committee have been given copies of that statement.

On page 4, I have reproduced part of a letter that ex-President Hoover wrote to Senator Albert Hawkes of New Jersey in 1945, in which he outlined very clearly the need for the development of the upper basin aspects of the canyon. I would like to read it.

As you know, I had the honor to be chairman of the Colorado River Commission which settled the Colorado River compact in 1922 and other matters relating to the development of the river. And during the following years I had many duties involving these questions * * *. In 1922 there was general agreement that the allocation of 7,500,000 acre-feet per annum to the upper basin would be more than ample to meet their requirements * * *. It is now realized that the allocation will fall far short of ultimate needs of the upper basin * * *. In 1922 the compact requirement that the upper States never deplete the flow of the river to less than 75 million acre-feet in any 10-year period, was not considered burdensome. Studies now available show that to meet this obligation the upper States will have to provide at least 20 million acre-feet of holdover storage to be used during low-flow periods, comparable to 1931-40, or lacking storage, will have to limit their use to about 64 percent of their allocation, in order to make available 75 million acre-feet at Lee Ferry.

That is an interesting confirmation from the man who had a great part to do with the development of the original plan for the development of the river.

On page 5 of my statement you will find some figures that I think will be interesting to show the extent to which the 2 basins have been able to use their share of the water and with its attendant benefits.

The lower basin has put 5,351,000 acre-feet of its share to use on an annual basis. The upper basin thus far is 1,923,000 acre-feet.

The lower basin has already developed $2\frac{1}{2}$ times as much of its share of the water as the upper basin States.

That was a result of the Hoover Dam and the other dams that followed on the lower reaches of the river, I assume.

Senator WATKINS. They did it with the help of the United States through reclamation projects.

Senator BENNETT. Yes, in the same way that we hope to develop the upper basin States. The other figures are interesting. The storage capacity in existence or authorized in the lower basin States is something over 38 million acre-feet, while those in the upper basin States amount to 1,696,000 acre-feet, a ratio of 23 to 1.

Assuming that it was the intent of the 1922 compact to allow half of the water to the upper basin States and half to the lower, it is interesting to observe that the lower basin States have been able to develop their share 38 times as effectively as the upper basin States.

And the electrical generating capacity in the 2 basins exists at an even greater disproportionate ratio. The lower basin has been able to develop 1,700,000 kilowatts as against 32,000, a ratio of 53 to 1.

That is on page 5 of my statement. On page 7 of the statement you will find figures that interest me very much because that in the development of the Central Utah project the greatest benefit will be through the provision of supplemental water to land that is already subject to some irrigation. The charge has been made that this will bring a lot of new land into use when we already have too much.

The ratio there is 168,000 supplemental acres to 32,000 new acres.

On pages 14 and 15 of the statement you will find some interesting figures comparing the money appropriated for flood control in the Middle Western States compared with the money that has been appropriated for the Western States for development of irrigation. It is 1,843 million as against 20 million.

I appreciate the opportunity to make this brief résumé and to submit the full statement for the record.

Senator WATKINS. It will be printed in the record as if it had been read in full.

(Senator Bennett's statement follows:)

STATEMENT OF HON. WALLACE F. BENNETT, UNITED STATES SENATOR FROM UTAH

WATER: OUR PARAMOUNT RESOURCE

THE COLORADO RIVER: UTAH'S LAST WATER SOURCE

To us in the semiarid upper Colorado River Basin and in all of my own State of Utah water is our paramount resource. Our water problem is all too serious to us in Utah, particularly as we contemplate the forbidding fact that virtually all of our available water has been, or will be, put to use in the near future. This, in general, is the plight of the whole upper basin.

The progress of an entire region, with our immense minerals and industrial potential, an expanding agriculture, and the growth of our cities, all hinge directly on the future availability of more water.

Without water our growth will be stunted; with water, a great new era of development lies before us—an era of benefit to the region and, consequently, to the entire Nation.

Therefore, I appear before this distinguished committee to urge your approval of the upper Colorado River storage project.

I have rarely seen the people of Utah so united as they are in this great cause. It is small wonder, for, in fact, the Colorado River is "our last waterhole." If the prophet Moses and the legendary King Midas were to appear in the State of Utah, there is little doubt whom we would follow. There might be a handful who would prefer the touch of gold. But the multitudes would follow Moses, preferring that our rocks bring forth life-giving water rather than that they be turned to gold. Paradoxically, both the water and the gold may be ours once we have the water, for few areas approximate the upper basin in the richness and variety of its minerals. The area has been described as a "yawning giant ready to awaken."

The same recognition of the relative importance of water in the scheme of things in the West was illustrated by the pioneers who first entered Utah. Irrigation was begun almost immediately while the colonizers were instructed by Brigham Young to forego mineral development, even during the height of the 1849 gold rush. The purpose was obvious—the settlers must first have a solid economic base. As we all know, mining was to come into its own, but water and farming came first.

NEED FOR THE STORAGE DAMS (GLEN CANYON, ECHO PARK, AND CURECANTI)

Why the dams are needed

The development and use of the Colorado River waters by the upper basin States hinges upon the construction of a main stem dam system, which includes Glen Canyon, Echo Park, and Curecanti. The storage dams are required for four principal reasons:

1. To meet the water guaranties of 7,500,000 acre-feet per year to the lower basin States (California and Arizona) contained in the Colorado River compact of 1922—a first mortgage on the waters of the river.
2. For storage so that the upper basin States (Wyoming, Colorado, Utah, and New Mexico) can use their share of the waters upstream.
3. For river regulation to counteract the highly erratic and cyclical flow of the river and to prevent silting in the lower basin.
4. To produce power for industrial use and to aid in financing the participating projects.

Storage and regulation

It may seem an anomaly that the key to getting the water onto the land in Utah should be two large storage dams from which no water whatever will be diverted, but such is precisely the case. Since we must deliver approximately 7,500,000 acre-feet of water per annum to the lower States, it is necessary that water be stored from good water years and from spring runoffs to meet that obligation. Otherwise, it would be impossible for the upper States to use their full share of the water without the risk of running short on delivery to lower basin States and Mexico.

The storage is doubly necessary because of the erratic and fluctuating flow of the river. It is impossible to predict accurately the period

of floods or drought, such as the great drought period in the 1930's when the flow was alarmingly low. If the upper basin States had been using their full share of the water instead of a fraction in this critical period, they would have been forced to cut back drastically irrigation and other water uses to meet the guaranty to the lower States.

Meeting the compact guaranty may be a more difficult task than was envisioned in 1922. The stream flow was estimated with the limited data of the time to be 21 million acre-feet per year. However, the flow is now only 17,700,000 acre-feet per annum.

Former President Herbert Hoover has shown an acute perception concerning the foregoing problems, as well he might, for he served as chairman of the Colorado River Commission. He portrayed the problems in a letter written in 1945 to the then Senator Albert Hawkes of New Jersey:

As you know, I had the honor to be chairman of the Colorado River Commission which settled the Colorado River compact in 1922 and other matters relating to the development of the river. And during the following years I had many duties involving these questions * * *. In 1922 there was general agreement that the allocation of 7,500,000 acre-feet per annum to the upper basin would be more than ample to meet their requirements * * *. It is now realized that the allocation will fall far short of ultimate needs of the upper basin * * *. In 1922 the compact requirement that the upper States never deplete the flow of the river to less than 75 million acre-feet in any 10-year period, was not considered burdensome. Studies now available show that to meet this obligation the upper States will have to provide at least 20 million acre-feet of holdover storage to be used during low-flow periods, comparable to 1931-40, or lacking storage, will have to limit their use to about 64 percent of their allocation, in order to make available 75 million acre-feet at Lee Ferry.

Regulation will therefore be of benefit to the lower basin since allocation of water will be facilitated. The storage dams will prevent much siltation of the dams in the lower basin and thus prolong their useful life.

Financing

The main-stem storage dams will furnish power revenues which will aid in the financing of the participating projects. These projects will depend to a great extent on the power revenues from the large dams although the entire project, taken as a whole, is self-liquidating.

Upper basin development is lagging

For a variety of reasons, the lower basin has been developed much more rapidly than has the upper basin, as evidenced by such monumental works as the Hoover Dam, Davis Dam, Parker Dam, and the All-American Canal. A comparison of the relative development of the two basins may be illuminating:

Colorado River water put to use:	<i>Acre-feet annually</i>
Upper basin.....	1,686,955
Lower basin.....	5,351,600
Upper basin.....	1,923,200
Total storage capacity of projects constructed or authorized for construction:	
	<i>Acre-feet</i>
	<i>(23 to 1 ratio)</i>
Lower basin.....	38,624,430
Development of power by projects constructed or authorized for construction by Congress in generating capacity:	
	<i>Kilowatts</i>
	<i>(53 to 1 ratio)</i>
Lower basin.....	1,700,900
Upper basin.....	32,000

We in Utah have watched with pleasure the great progress made in the lower basin. We have witnessed the extensive agricultural developments, the growth of industrial developments, the population influx and the overall increase in wealth made possible to a great extent by the utilization of the Colorado waters and the very important byproduct—power.

The entire Nation has been inestimably benefited by the development of the lower basin and there is every reason to believe a similar boom will be conferred by a corresponding development of the upper basin's share of the Colorado water.

Further delay may be fatal, for if the storage dams are not constructed soon and allowed to fill before the maximum use of water is made in the upper basin, it will be extremely difficult to fill them later. Further, if the water continues to flow down the river and is used there, the upper basin would have a difficult time in ever getting their water once an existing economy is based on the waters. This would probably be true, I'm afraid, despite the compact.

UTAH AND THE PROJECT

Need for water and power in Utah

In agricultural development.—To properly evaluate the upper Colorado River project, it is necessary to view the tremendous potential of the area. Because I am best acquainted with Utah, I shall confine my remarks largely to my State.

At the present time, less than 2.2 percent of the land in the State of Utah is irrigated. Of the 1 million acres currently under irrigation, fully 60 percent, or 600,000 acres, has only a periodic supply of water and undergoes severe shortages annually. Utah's farmers, most of whom run small farms, need the water with its invigorating impact which can come alone from ultimate development of the central Utah, Gooseberry, and Emery projects. A summary follows:

Projects	Acres of new land irrigated	Supplemental acres irrigated	Total acreage
Central Utah.....	28, 500	132, 000	160, 500
Emery County.....	3, 630	20, 450	24, 080
Gooseberry.....		16, 400	16, 400
Total.....	32, 130	168, 850	200, 980

It is hoped that with ultimate development of Utah's share of the Colorado waters, the total of new irrigated land will be about 210,000 acres, and that furnished supplemental water 250,000 acres. This will still leave nearly one-half million acres in the Colorado and Bonneville Basins needing either a full or partial supply of water.

The crops produced in Utah are not in competition with the major crops of the Nation, so that the development would not contribute to the present surpluses. Except for fruits, vegetables, sugar beets, and canning crops, our agricultural production is harvested through livestock. Moreover, it will take from 10 to 20 years to get the projects into operation. It is likely that any increase in production will be consumed locally by Utah's rapidly increasing population.

In our municipalities.—Many of Utah's towns and cities are in critical need of culinary and industrial water, particularly in central Utah. Cedar City has had a great struggle to obtain a sufficient supply of water and has had to resort to rationing. Nephi has condemned agricultural lands so that they might obtain culinary water. Rationing has been the rule rather than the exception. Cities in eastern Duchesne County are in need of water, as are communities near Salt Lake City. The sobering part of this picture is that virtually all of the water in these areas even now is tapped and in use.

In the meantime, Utah's population has increased 27 percent in the years 1940 through 1953, a growth well above the national average, and exceeded by only 10 States. Utah leads the Nation with its vital index—that is, a high birthrate and low death rate. If proportionate growth continues, the State's population will be well over a million by 1965 (compared to 750,000 today), the earliest date by which the initial phase of the central Utah project would be completed. The strain on our water resources can well be imagined if additional water is not forthcoming.

For years one of Utah's major exports has been the trained intelligence of our young people who emigrate because of lack of job opportunities. They have enriched the Nation but it is a lamentable circumstance that they should feel obliged to leave the place of their birth, especially when it is possessed of a treasure trove of wealth and opportunity, given the vital elements of water and power. It has been estimated that Utah can support a population twice its present size if our share of the Colorado River waters are made available through the full development of the central Utah, Emery County and Gooseberry projects.

Water and power are needed for our industrial potential.—It may be said without exaggeration, I believe, that Utah is the mineral storehouse of the Nation. By enlarging this statement to include the upper basin, there can be no contradiction advanced whatever. I know that it is popular to relate any project to national defense no matter how remote the relation may be. However, a direct relation exists with respect to uranium. Utah is one of the most important world sources of such radioactive ores as uranium, vanadium, carnotite, and pitchblende. Together with western Colorado, the area probably provides the greatest domestic source for uranium, although exact production is a carefully guarded secret—this is an area where we have a dependable supply not subject to the vagaries of political machinations abroad. Water and power are, of course, needed in great quantities in the processing of these ores.

In terms of the variety of minerals from which new wealth was and is created, Utah is excelled by no other State. As processes for developing synthetic liquid fuel are perfected, the fact that Utah has 200 billion tons of coal and that there are 800 billion tons within 350 miles of Salt Lake City will be increasingly important. This comprises one-seventh of the world's known coal reserves.

Virtually all of the materials necessary for the development of a chemical industry are to be found in Utah, but the existing water and power supplies are not now sufficient to fully develop the great possibilities of such an industry.

Utah is one of the main producers of nonferrous metals and ranks at the top or near the top in the Nation in production of copper, zinc,

lead, silver, and gold. There are great deposits of magnesium in the Great Salt Lake and in southeastern Utah, but again large amounts of water are required to obtain this metallic element.

Utah is now in the iron and steel business with ever-increasing opportunities for satellite industries; 50,000 acre-feet of water per year is consumed at the Geneva mill, while at the same time circulating 146,000 acre-feet.

Phosphate fertilizer is critically short, and it is significant that the largest known deposits of phosphate rock are in the upper basin States. Power and water again are required.

A further recitation of the vast mineral and industrial potential in Utah and in the upper basin would probably sound too much like a chamber of commerce brochure. However, Utah is at a critical juncture in its history with much of our future possibilities contingent directly upon the water and power made available by this project. It is impossible to overdramatize our need, for it is either progress or stagnation.

Need for the Echo Park Dam (to the overall project and to Utah)

Storage.—As a storage dam, the Echo Park Dam is without peer among alternate sites proposed because of its lowest evaporation rate. We cannot afford to be profligate with water in an arid area abounding in scenery.

A power hub.—The Echo Park Dam can, together with Glen Canyon, produce the cheapest power of any of the proposed dams. This is an important factor in the financial feasibility of the project. It will also firm up power at prospective dams in the ultimate phase of the project, making them feasible.

Of particular interest to the upper basin, including Utah, is the central location Echo Park has to the upper basin power market. If Glen Canyon is built without Echo Park, the power will be in all likelihood go south and will not be available to power users in the upper basin. Present plans call for interconnecting Glen Canyon and Echo Park power which can then be transmitted to the upper basin States. If this is not done much of the value of the project will be lost to Utah and the other affected States.

River regulation.—Echo Park is strategically located at the confluence of the Green and Yampa Rivers and, hence, is able to regulate both rivers.

Echo Park not an invasion of Dinosaur Monument.—The Echo Park Dam has been the object of considerable and often loose and inaccurate discussion. Opponents of the dam claim that its erection will create a precedent destructive of the national parks and monuments system. In doing so, they brush aside the solemn promises made to the peoples of Utah and Colorado by the National Park Service that enlargement of the monument in 1938 would in no way interfere with its then contemplated use for reclamation and power sites. They ignore the reclamation withdrawal made in the President's proclamation enlarging the Dinosaur Monument from 80 to 209,000 acres. They overlook two power withdrawals made in the same proclamation. The United States Government has made a moral commitment to the people of Utah and Colorado, and the dam at Echo Park should be judged on its merits and not on the concocted issue of "invasion" or "precedent."

Of great inspiration to the early settlers of Utah was the statement made by the prophet Isaiah that "the desert shall bloom as the rose." It is indeed fortunate that these hardy folk were not met as they came out of the Wasatch Range of the Rockies by advocates of this newly interpreted 1954 doctrine of conservation, for they would probably have been told to ignore Isaiah and "let the desert remain as it is."

We in Utah are greatly concerned about what we believe is the truer, less adulterated conservation. We not only relish fine scenery but we also cherish an abiding interest in the conservation and use of our most important resource—water. We are concerned about human resources as well as mineral resources and industrial resources, and with their conservation. Utah abounds in scenery comparable to Echo Park and in national parks and monuments and "primitive" areas. Since the Echo Park Dam is most clearly neither an invasion nor a precedent, the only question remaining is whether Utah and the upper basin shall progress.

PAYING FOR THE PROJECT

It is a self-liquidating and economically feasible project

Because of the complexities of the project it has been considered as a unit and as such qualifies within the reclamation law as a self-liquidating and economically feasible project.

The projects don't cost—they pay

Opponents have seen fit to criticize the financial aspects of the project and have said that it is too costly, that power shouldnt be used to aid the irrigation projects and that there is a "concealed subsidy" since the irrigation expenditures are interest free. Because of the great benefits to be derived from reclamation projects, both direct and indirect, it has been the law of the land for 50 years that irrigation developments should be interest free. Quite apart from the new wealth which is created by such projects as that which we are considering, a spot study of a few typical reclamation projects constructed by the Federal Government indicates that these districts have paid for themselves by $4\frac{1}{2}$ times in taxes. This is a remarkable record, and the vision shown by the reclamation advocates seems justified.

Another aspect of this problem is the 15 to 20 million dollars which will continue to flow into the Treasury after the project completion, thus, in all probability, paying for the interest.

Fully two-thirds of the project, including power and municipal water features, will be repaid with interest—\$647,000 of the total of \$972,356,000.

Some comparisons may be in order to maintain proper perspective in evaluating the interest-free financing of the irrigation features of the project:

Total expenditures for rivers and harbors and flood control by the Corps of Engineers is \$8,314,748,713. This nearly \$8 $\frac{1}{2}$ billion spent up to June 30, 1953, was not only completely interest free, but not 1 cent of it must be repaid by those who benefit from it. It may be instructive to itemize the expenditures for flood control and rivers and harbors for a few selected States.

Federal expenditures for flood control and rivers and harbors improvements

Total to June 30, 1953.....	\$8, 314, 748, 713
Total for fiscal year 1949-53.....	3, 061, 562, 995

FOR SELECTED STATES, FISCAL YEARS 1949-53

Arkansas.....	\$181, 006, 630
California.....	192, 685, 079
Illinois.....	111, 671, 410
Mississippi.....	102, 772, 890
Missouri.....	100, 920, 311
North Dakota.....	152, 946, 308
Oregon.....	293, 956, 398
Pennsylvania.....	109, 640, 986
South Dakota.....	196, 567, 176
Texas.....	193, 330, 351
Virginia.....	101, 988, 860
Washington.....	166, 012, 321
Total.....	1, 843, 398, 660

FOR THE UPPER BASIN STATES, FISCAL YEARS 1949-53

Colorado.....	\$12, 913, 102
New Mexico.....	5, 482, 363
Utah.....	1, 537, 289
Wyoming.....	980, 000
Total.....	20, 192, 654

The upper basin share in the 5 fiscal years cited is less than seven-tenths of 1 percent (0.007) of the total for the Nation as a whole of over \$3 billion. Utah's share was approximately five one-hundredths of 1 percent of the total (0.0005).

I do not begrudge the expenditure of this money but it must be remembered that these billions spent in 5 fiscal years are not only interest free but none of the principal need be repaid. In contrast, less than 3 percent of the upper Colorado River project is nonreimbursable. Two-thirds of the principal with interest will be repaid to the Federal Government. Two-thirds of the principal with interest will be repaid to the Federal Government. The other one-third of the principal will be repaid although it is interest free.

The upper Colorado expenditures will be staggered over 50 years or more while the rivers and harbors outlay noted above covered only 5 years.

Foreign aid.—Since World War II the United States has given almost \$100 billion in aid to foreign countries. This money will be neither repaid nor will it bear interest.

In grants through the so-called counterpart funds since April 3, 1948, expenditure approvals on behalf of agriculture alone have amounted to \$919,700,000. Of this total, expenditures for land reclamation and irrigation schemes comprised \$403,100,000. The total for transportation, communications, and utilities amounts to \$1,826,900,000. I have noticed only in the past week that we are now building dams in Korea.

Some people have humorously suggested that the upper basin temporarily withdraw from the Union and qualify for point 4, technical assistance, and other foreign-aid programs. It seems probable that much of this money spent has been a good investment. History alone will tell the final story as to whether or not our expenditures in foreign countries have been wise and fruitful, but history has already

proved the value of reclamation out in the Western States through which the Colorado River flows.

Use of power revenues.—When it is considered that the same people who use the water from which the power is derived, will also buy and benefit from the power, it seems appropriate that power revenues be used to aid the water development. After all, power is only a byproduct of falling water and it seems only fair that revenue resulting from the development of one phase of a public resource should be used to aid in developing every other phase of the same public resource.

The basic policy of using power revenues to aid irrigation has been deemed sound in the past and has been in the reclamation law for decades.

I think it is remarkable that the power aspects of the project have not gravitated into a public power versus private power fight. On the contrary, the cooperation displayed by all interests concerned can serve as a model for the entire country. The private companies recognize the importance of the project and have offered constructive proposals by which they will buy the power not contracted for by preference customers.

The Federal Power Commission, the private power companies, and others who have studied the problem agree that there will be an ample market for the power. The rate of 6 mills per kilowatt-hour proposed for power from the project compares favorably with the cheapest steam power in the area which is estimated to cost 7.3 mills.

THE UPPER COLORADO RIVER PROJECT, AN INVESTMENT IN THE FUTURE

The Bureau of Reclamation together with the upper basin States has planned, investigated, and studied for 25 years so that we might use our share of the waters of the Colorado River and develop our potential power resources. These extensive studies have culminated in the carefully planned and integrated proposal which is before this committee.

It is a soundly conceived and boldly projected plan upon which the future of an entire region is predicated. It proposes to provide for use of the waters so solemnly agreed upon in the Colorado River compact of 1922. It is the only practical plan by which the lifegiving waters may be utilized. It enjoys the endorsement of President Eisenhower and his administration.

Approval of the upper Colorado River project by this committee will be a master stroke opening the door into a region of unparalleled wealth waiting only for the water and the power contemplated in this development. I am confident that this committee will have the vision to foresee the national benefits attainable and I urge and recommend your approval.

Senator WATKINS. Senator Chavez, we had a statement from you here the other day, but we are glad to hear from you personally.

STATEMENT OF HON. DENNIS CHAVEZ, A UNITED STATES SENATOR FROM THE STATE OF NEW MEXICO

Senator CHAVEZ. With the permission of the committee, and you, Mr. Chairman, I will proceed. I am glad that you are presiding, because I am going to talk this afternoon about matters which affect

your State as much as New Mexico. I refer to the water that rightfully belongs to the upper basin States of the Colorado River system.

It possibly would be correct to give a brief background. Under the sponsorship of Mr. Herbert Hoover, then the Secretary of Commerce, there met at Santa Fe the official representatives of the different States, who signed the Santa Fe compact as between the lower basin States and the upper basin States. Every State involved, with the exception of Arizona, signed that compact. That was the origin of your Boulder Dam project, or now the Hoover project.

Throughout the years, investigations were made. The upper basin States, for some reason or other, did not protect themselves in the basic law of the Boulder Dam projects. All they did was to sign the compact. But the original law provided that out of the power produced at Boulder Dam, Ariz. was to get 17½ percent and Nevada 17½ percent. California and Arizona and Nevada got the water and the power, but we signed the compact.

The original law even went to this extent: that the upper basin States—those four upper basin States—would not come into the picture until the original debt was amortized. And I think it was in the days of Senator Pittman that the law was changed in the Senate to provide from the funds of the Boulder Dam power at the rate of \$500,000 a year to investigate, explore, and find out about the feasibility of use of the water that belonged to those upper basin States.

Now, I am strong for California and for Nevada and for Arizona, and I want them to grow, and I want them to get water; but not the water that belongs to Utah, not the water that belongs to Wyoming, not the water that belongs to New Mexico or Colorado.

We have been working as neighbors. The upper basin States got together, and there was allowed from the watershed water of the Colorado so much to Utah, so much to Wyoming, so much to Colorado, so much to New Mexico. The New Mexico amount was 750,000 acre-feet out of the San Juan. Unless legislation of this type is brought about, we are not getting use of that water. All we use of the 750,000 acre-feet is 70,000 acre-feet a year in San Juan County. But once it crosses the Arizona line, we can't get it back for New Mexico. Hence, we need this class of legislation in order to get our water. We are entitled to 750,000 acre-feet in the State of New Mexico: that is no one particular county, no one particular city, but the State of New Mexico is entitled to 770,000 acre-feet. But, unless something is done about it—and we create some kind of a project—like you would with Glen Canyon, or the other places in Utah—the water will run away, and eventually go to Boulder Dam, and from there it is lost. And it is not California's water or Mexico's water. It belongs to Utah; it belongs to Wyoming; it belongs to Colorado; it belongs to New Mexico.

So I don't think there is anything unfair in asking the Congress to pass legislation that will protect the water that belongs to Utah, to Wyoming, to Colorado, to New Mexico, and to put it in effect.

But it is a practical thing. I would not blame my good friends from California for being against the project in New Mexico or Utah or Wyoming, because as long as there is no project, the water runs down the river and it is to their advantage. And while I like them as neighbors, and as friendly States, and as friendly citizens, I still think

that we are entitled to that water. And that is the only point that I wanted to make—that eventually we should pass some legislation here that what belongs to Utah we should let Utah keep, and let them utilize it and put it to use, and what belongs to Wyoming, put it to use in Wyoming, and what belongs to Colorado, put it to use in Colorado.

And believe me, we have such a little water in New Mexico that I want to take care of every acre-foot, Mr. Chairman. And that is the whole point in a nutshell.

I want San Juan County to get all of the water it can feasibly use. Beyond that, I do not want it to go to Arizona or Colorado, or anywhere else, except on a good, sound, business basis.

I have reviewed the testimony taken by the committee yesterday as it relates particularly to the statements of Mr. John Gregg of Las Cruces, N. Mex., and three officials from Texas. It is exceedingly unfortunate that misunderstanding has arisen, but I believe that it is not something that cannot be straightened out through supplemental testimony if the committee so desires.

1. Much of the opposition to the transmountain diversion proposal voiced by the witnesses' statements was based on an "interim" report by the Bureau of Reclamation. In this report the good people of the Rio Grande Valley below the Elephant Butte Dam foresaw so many ghosts which, in fact, do not exist in a practical sense. I think the Bureau of Reclamation area engineer, Mr. John L. Mutz, would have testified, if asked, that the "interim" report was nothing more than a report prepared for the State of New Mexico and it is too bad that it fell without any explanation into popular hands. In connection with this upper basin development, each of the four States was surveying her share of the Colorado River waters for an optimum development. This meant each State was to dream up all the projects she could, then merge them off, one against the other, to finally arrive at a comprehensive basic program for this one bill. Mr. Mutz is to be commended rather than deplored for his rather complex proposals. He proposed power because the diversion offered excellent power drops and northern New Mexico is very power short. I suppose, too, he proposed to pick up flood flows and store them in the good years for regulated release. I do not know what all he had in mind, but I do know it would result in the ultimate of essential use. However, New Mexico did not elect to use such a comprehensive program because water availability and costs exceeded practical programing. What was advanced was an idea, and the witnesses are objecting to an idea, as is their right. What was suggested as a maximum program to New Mexico, and from which we were to choose plans, became construed as a project report. I do not quite understand the lack of knowledge on the part of Mr. Gregg and others as to what was being planned, because the most probable plan seems to be one in which the Rio Chama will not be dammed at all. What is more likely to be proposed is a storage dam of 400,000 acre-feet on Willow Creek. It is almost dry and is a drainage area, and if it contributes 10,000 acre-feet a year to the Chama I am being exceedingly generous. Therefore, what Texas is objecting to in testimony may be a problem in which they would have no interest at all. It is better that we wait for a formal project report, at which time I am agreeable to full-scale hearings if such are wanted.

2. This marks the second time we have had to oppose the Elephant Butte Irrigation District in order to give them more water, despite the fact we were told irrigation water is gravely short. Against the opposition of this district, the congressional delegation put over a program to channelize the Rio Grande, which now means we are delivering 100,000 acre-feet more to Elephant Butte Reservoir than before. In the proposed transmountain diversion there is a strong likelihood there would be another 80,000 acre-feet of bonus water for the Elephant Butte Irrigation District. I have arrived at that figure simply by subtracting uses from availability. New Mexico's fair share of the San Juan water is mathematically $11\frac{1}{4}$ percent of 754,000 acre-feet. Of this amount about 70,000 acre-feet is under present use in San Juan County. The Shiprock and South San Juan project would use about 300,000 acre-feet. Other uses and evaporative losses would reduce the available New Mexico quota to around 300,000 acre-feet. This 300,000 acre-feet would go for various purposes in New Mexico, such as the diversion, et cetera. Because of the excitement the interim report caused, I wouldn't want to spell out what I believe would be the detailed uses of the water of the San Juan, but I can state very positively that I think there will be 80,000 acre-feet unused of San Juan water available for the Elephant Butte Irrigation District for New Mexico users. For just once in my life I wish there was some way we could show the farmers of the lower valley that we are trying to deliver extra water to them and not take it away. The 100,000 acre-feet in the channel, plus this 80,000 acre-feet of diversion and exchange combines into 180,000 acre-feet that we have had to oppose the lower valley to give them.

3. One other statement made in the testimony was that they couldn't tell how the water could be separated in the Rio Chama. There is only one gage under the compact and that is at Ottowi on the main stream of the Rio Grande. The State does have gages at El Vado and at the confluence of Willow Creek and the Rio Chama. Since the one storage dam would be on Willow Creek, there isn't the slightest chance in the world that this water couldn't be measured as carefully as with a spoon. I understand their apprehension, but not before we are talking about the same thing.

4. We have also had raised the question as to what this language means. We have been writing these bills around here for a number of years both for the Army engineers and the Bureau of Reclamation. The language such as proposed here has always meant that Congress thinks this idea is a good one for inclusion in a river program and recommends that the Bureau of Reclamation bring to the Congress a report on the project. It may not even be feasible, and some of them haven't. The only construction I place on this was that Congress O. K.'d the ideas of the States for the upper basin development and on these participating projects Federal approval was given for official project reports. There is only one reason why we do that.

Small sums of money have been spent on the upper basin investigation for years. The revenue for these studies has come largely from Colorado River compact allocations and has been supplemented in part by congressional appropriations. Now we want a full-scale study made soon and this legislation authorizes the Bureau of Reclamation to marshal its personnel and to request Congress for the funds to wind up this four-State program. That's all I saw in the bill.

I think it is prima facie correct that any project operating in New Mexico on the Rio Grande would certainly have to fall all or in part within the terms of the Rio Grande Compact. The compact is probably the most complex existent on any river in the United States and part of the difficulties have been in the administration of the compact. I have had very competent water experts tell me that if you didn't participate in the writing of the compact, then you would never be sure in the administering of it.

5. I certainly do not criticize John Gregg or the people of El Paso for fighting against the actual loss of any water. I have taken the same position on a statewide basis, but it is not a wonderful thing to find people in your own State opposing you purely on the grounds of misinformation and failure to seek information. I think the lower valley would be a lot better off if the management would keep an alert eye on any upstream planning and then say, "What's going on up there? Let us help you." It is a much better way for them to stay abreast of development and get what they want or is fair into the proposal before it ever leaves the State. For years I have wanted the Elephant Butte Irrigation District to participate in planning in the State.

6. To agree now to the restriction of any storage before a project report is made is as ridiculous as some of the testimony you have just heard. The 235,000 acre-feet mentioned is not a firm agreement. It is only an engineering formula for purposes of this optimum interim report. It could have easily been 100,000 feet, since it was only the figure "X" for the formula.

I suggest the committee go right ahead and authorize the Bureau to submit this report and endorse this participating project as has been proposed by the Upper Colorado River Association. When the Bureau has submitted a project report, if one is, indeed, feasible, then it will be presented back to this committee and at that time all of us will know more about that which we like or dislike. It will be wide open for objection. The language is certainly entirely harmless to any area or group in New Mexico. It would be disastrous if it were left off—disastrous to New Mexico. If New Mexico is left completely out of this bill, then our full share of the San Juan waters is placed in jeopardy under the same theories you heard yesterday, but from lower basin States and perhaps even the other three upper basin States.

In addition, I do not believe New Mexico could share in the power revenues by the basin plan unless it was specifically written into the bill in lieu of the projects. We cannot afford to be left out.

Senator WATKINS. Congressman Dawson? We are glad to have you with us.

STATEMENT OF HON. WILLIAM A. DAWSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF UTAH

Representative DAWSON. Mr. Chairman, we are voting on the agriculture bill in just about 15 minutes, and I would like to have more time to come over here and expand on my statement, but suffice it to say we sat through these hearings over in the House for a number of weeks. We heard extensive testimony. We have gone into this matter from one end to the other, and we have also been investigating the project since 1922 and even prior to that time, and I know of no project

that has been before the Congress that has had the work go into it and the investigation that this project has had.

I want to state, Mr. Chairman, that I am convinced that this is one of the best projects from any standpoint from which you want to figure it that we have had for a long, long time. For us out in the West, I want to say that we are fighting for our existence, and I would like to submit a statement for the record.

Senator WATKINS. It may be submitted for the record.

(The statement referred to is as follows:)

STATEMENT OF HON. WILLIAM A. DAWSON, A REPRESENTATIVE IN
CONGRESS FROM THE STATE OF UTAH

Mr. Chairman, when the waters of the Colorado River were divided between the upper and lower basin States in 1922, the people in Utah, Wyoming, New Mexico, and Colorado had good reason to expect that when the time came for us to put our share to use we could expect full support from the member States in the lower basin.

Why did we expect that support? In the first place it was promised. "Work up a sound development program" we were told, "and there will be no opposition from us." On the basis of these promises, Members of Congress from the upper basin States have consistently supported projects for the lower basin. Water development was needed early to quench the thirst of the rapidly growing population in southern California and parts of Arizona. And firm in the belief that our rights to the river were protected by solemn compact, and reassured that our support for their development would be reciprocated, we shared in the general sense of accomplishment as we watched the lower basin States harness the river, extract its hydroelectric power, and send its waters through irrigation ditches to parched lands.

Meanwhile we continued to plan, surmounting hurdle after hurdle. First there was the necessity of dividing the water among the upper basin States—no mean task in an area where more blood has been shed over water than over women. Then there was the need for an integrated plan in order that all of the States could gain the maximum benefit from a river that even today is not large enough to meet all the water requirements of the four upper basin States. We have developed that plan, and it is before you today.

The upper Colorado River Basin is the only major river basin in the Nation which is not being harnessed to enhance the productive capacity of our country. It is ironical that the development of the Colorado River area has lagged so far behind, particularly when the river flows past some of the greatest power dam sites and through the most water-needy States in the Union.

Compare the development already constructed or authorized by Congress of the upper and lower river basins.

The lower basin has 1,700,900 kilowatts of power generation compared to the upper basin's 32,000. Storage capacity in the lower basin is 38,624,430 acre-feet—compared with 1,686,955 in the upper basin. River water put to use is 5,361,600 acre-feet annually in the lower basin—1,923,000 in the upper.

Certainly, the four upper basin States are now justified in believing that it is their turn.

This is one of the soundest projects to come before Congress this session. Unlike many of our recent reclamation projects, most of the advanced funds are reimbursable. Fully two-thirds of the projects' power and municipal water features will be repaid with interest. Less than 3 percent of the overall cost is nonreimbursable. The repayment period is only 50 years. When contrasted with many other reclamation projects now under construction, or already adding to the wealth of the Nation, it is evident that the Colorado River storage project is sound, feasible, and economical. One needs only to contrast the repayment project of this legislation with the out-and-out grants for flood-control projects, to see how ridiculous are those arguments that this project is a waste of the taxpayers' funds.

I would like at this point to say just a few words about the opponents of this legislation. Since my bill was approved by the House Interior and Insular Affairs Committee, I have become somewhat of an authority on the techniques of the opposition. The opposition has come from two sources. An organized attempt by well-meaning conservation groups to stop construction of the Echo Park Dam in Dinosaur National Monument. The most vocal of the organizations opposing this dam has been the Sierra Club of California. We find that fact significant. There is ample testimony both before this committee and in the records of the hearing of the House to refute all statements that this dam would establish a precedent or would destroy the scenic value of the monument. When opposition to Echo Park Dam failed to defeat the project in the House committee, its enemies expanded the attack to include the entire project, and the expanded attack ostensibly aimed at this project alone is in fact an attack upon the entire reclamation program. If this project should fall before the arguments advanced against it in this latent onslaught, all reclamation is equally vulnerable.

Those of us who have seen the vast new wealth that reclamation has brought to the Nation, those of us who have seen power development furnish the muscle for our airplane-manufacturing industry during the last war, do not have to be sold on the value of a reclamation program. The most logical extension of it now is the development of this, the last remaining major river basin. That development is provided for soundly, economically, and logically in this legislation before you.

Senator WATKINS. Congressman Stringfellow, we are glad to have you with us.

STATEMENT OF HON. DOUGLAS R. STRINGFELLOW

Mr. STRINGFELLOW. Mr. Chairman, it is very gratifying to me to have this opportunity to appear before the Senate Interior and Insular Affairs Committee in support of legislation to authorize construction of the upper Colorado River project and participating projects.

Before I present the basic premises on which we are predicating our case for authorization of these power, irrigation, and reclamation projects which will mean so much to the economy of our Western States, I would like to make a few brief observations.

As most of you know, I am a freshman Congressman, and as such I have had a great deal to both learn and unlearn since coming to

Washington. I entered the political arena via a comparatively tranquil position as a radio announcer and commentator. It would be folly for me to try to pass myself off as a shrewd or skilled politician because I still believe my basic philosophy of what is right or wrong springs from the principles enunciated in the Good Book, rather than based on what is smart or politically expedient.

In radio, we had to follow a policy of very carefully editing and screening the material to be aired in order to avoid dissemination of untruths or defamatory material. Time was a very precious element that we had to watch and guard very closely.

Since coming to Washington, I have been exposed to an entirely new concept of thinking. Here we are confronted with not only half truths, white lies, and plain lies, but more recently with "dam" lies, and I've purposely omitted the "n."

In Washington, time does not seem to be of any essence, unless someone is hurrying to get to a cocktail party. Too often we are prone to say, if Congress doesn't get around to certain legislation this year, there's always another session coming up next January.

Now, you gentlemen may wonder what these somewhat obtuse observations have to do with the authorization and construction of some reservoirs and dams on the upper Colorado River. Briefly this is it. Because I am not a professional politician and hence haven't been shouting to the housetops as to my legislative abilities and what I have or have not done for my State of Utah in trying to obtain approval for legislation authorizing Echo Park Dam and other phases of this multiple reclamation project, I have been severely castigated by some residents of my own State. On the other hand I have been lambasted, criticized and deluged with derogatory letters from know-nothing "do gooders" in most every other State in the Union because I have done too much in sponsoring and working for the passage of this legislation. In other words I'm caught in the bind between those who say we aren't doing enough for reclamation and those who would like us to do nothing. Well, I'm serving notice here and now that I have and will continue to devote as much of my time and efforts as possible to this project—and we aren't about to quit fighting until these dams are authorized and construction is underway.

The element of time is a very important ingredient in reclamation as it is in radio—because just as seconds tick off a clock and are lost forever, water is also constantly running downhill and its use for irrigation and power purposes is very quickly lost to the upper basin States. Thus, every day Congress delays in approving the upper Colorado River project, we are wasting millions of gallons of water, one of the most precious and limited resources this Nation possesses.

The thing which has disturbed me most since I assumed my congressional duties is the wide dissemination of fallacious material which is circulated concerning legislation introduced in Congress. Certainly none of us are immune to honest criticism and our legislative proposals should always be subjected to careful scrutiny. But it is quite another thing when opponents of a measure have to resort to gutter and alley tactics in order to stimulate opposition to legislation which if enacted would benefit the whole Nation.

I have been disheartened and sickened by the foul lies which have been spread concerning Echo Park Dam and other phases of the proj-

ect. Unfortunately the opposition has not had the decency or commonsense to base their arguments on constructive grounds, but have resorted to emotionalism and hysteric appeals that construction of this project would be a desecration of our national parks. As a result many well-meaning people have lent their names, time, and efforts to opposing Echo Park and other phases of this project, who would never have done so if they but knew the truth. The big lie has thus become a "dam" lie—built upon deceit and subterfuge. However, it is not too difficult to see behind the smokescreen of opposition and discover that the real opponents are not wildlife groups or conservationists, but really California water users and tub thumpers who know that if they succeed in thwarting authorization of this project, they can continue to unlawfully appropriate and use water and power resources which rightfully belong to the upper basin States of Utah, Wyoming, Colorado, and New Mexico.

If the statesmen in Congress will but stick by the basic principles of what is right and good for our people we cannot fail in gaining approval of this legislation. If we succumb to the weaseling lies of those who unjustly oppose reclamation, we will delay progress and further development of the West for the benefit of not only this generation but during the lifetime of children yet unborn.

I can only speak for the people of my State of Utah, but the situation is the same in all of the upper basin States. We need water and power desperately, and our economic development depends upon our ability to harness this last remaining great waterhole—the upper reaches of the mighty Colorado.

Some opposition has come from economy-minded groups who view the billion dollar price tag attached to the upper Colorado with some alarm. They fail to realize that the cost of this project would be spread over three-quarters of a century and that a large portion of the Federal investment would be repaid by the water users and through the sale of power. Likewise, these same economy-minded alarmists have very vigorously supported our foreign giveaway program that has pumped 50 billion United States dollars into foreign countries since the end of World War II—and these dollars and goods are gone forever.

On the other hand, development of this reclamation project will create new jobs, opportunities, and development of vast untapped resources in Utah and other Western States. The future of our atomic-energy program depends a great deal upon the development of our water resources on the upper Colorado because the largest uranium deposits in the United States are located on the Utah-Colorado Plateau. Likewise, our State is rich in potential deposits of vanadium, coal, iron, oil, magnesium, chloride, potash, phosphate, and so forth. Water is essential to the development and extraction of all of these minerals.

In addition, there will be thousands of acres of new land brought under irrigation and cultivation and added water for lands presently being tilled. Water for culinary use will be insured, as will power for the ever-growing and expanding urban areas of our Western States. We must have this water and power for our survival—or stop growing. Only approval of the upper Colorado River project will insure the most beneficial development and use of these urgently needed resources.

To illustrate what water development has meant to Utah, we need only to look at our history books to see that irrigation has been the difference between an arid wasteland and the "desert blossoming as a rose." In 1849 President Brigham Young, of the Mormon Church, sent out a planning party to select possible sites for settlement for the Mormon people as they arrived in Utah.

This venture was unique in planning annals, since it proposed at the outset the complete coordination of resource development with the needs of a population not yet on the ground. As the people reached Salt Lake they were organized into colonies and sent out with 50 families going to one stream and 200 to another, and so on until the communities of the State were staffed as going settlements.

Since 1849 these communities of Utah have supported the Nation through five wars by providing the products of the fields, mines, and forests, as well as their full share of competent manpower. Equally and perhaps even more important than this contribution has been the support these settlements have provided for the day-to-day life and activity of the Nation through the avenues of trade and commerce.

Utah has now 300,000 automobiles and trucks registered, and yet it has no automobile factory. It purchases millions of large and small household appliances, automobile tires, razor blades, and safety pins, and millions of yards of cloth and items of clothing it does not manufacture.

All this has been made possible by the development of the water resources upon which all else in Utah is predicated. The upper Colorado River storage project now being considered by the Senate Interior and Insular Affairs Committee would take Utah and the great intermountain empire around a new turn in resource development and would open up and make available new vistas of trade and commerce as a result of which our entire national structure would benefit.

I urge this committee to seize the reins of initiative, dispel the torrents of gloom and pessimism, cast off the yoke of untruths and lies, and favorably report S. 1555 to the floor of the Senate for approval before the close of this session of Congress. If you take such action, I promise you that this will become one of the monumental pieces of legislation to be enacted by the 83d Congress, and will be an everlasting credit to those who serve so well on this committee.

Senator WATKINS. Congressman Dempsey, we welcome you.

STATEMENT OF HON. JOHN J. DEMPSEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW MEXICO

Mr. DEMPSEY. The indulgence of your committee in hearing me at a time when your duties are most arduous is deeply appreciated. I shall seek to be as brief as possible in presenting my statement in behalf of S. 1555.

As your committee knows only too well, water is a veritable life-blood of my State of New Mexico and its neighbors in the Southwest. Never in the history of the State have the people enjoyed a plentiful and adequate water supply. Our area is described as semiarid. In the last few years it has been so seriously menaced by water shortage and drought that semiarid is almost an exaggeration.

The purpose of the legislation under consideration by you at this time is to grant congressional authorization for the making of surveys

and plans so that the State of New Mexico may avail itself of its rightful share of the waters of the San Juan River under the terms of the upper Colorado River compact. New Mexico's allocation under that compact is approximately 838,000 acre-feet of water per year.

At no time in the past has New Mexico been able to utilize more than a very small percentage of the water to which it is entitled under this upper Colorado River compact. As a result approximately 750,000 acre-feet of New Mexico's share of the water under the compact is being irretrievably lost annually to the State. That loss is a severe and disastrous economic handicap, particularly at a time when the State's water supply is barely 50 percent of normal.

Enactment of this legislation now is the only way in which this calamitous situation can be corrected without unnecessary delay. The legislation is merely authorization for the Bureau of Reclamation to make the necessary surveys and preliminary plans to determine the feasibility of the projects involved. It is an essential part and parcel of the overall program for development and proper conservation of the great water resources of the Colorado River and its tributaries.

The language of the bill is specific. The measure provides, and I quote—

that no appropriation for or construction of the San Juan-Chama project or the Shiprock-South San Juan Indian irrigation project shall be made or begun until coordinated (or feasibility) reports thereon shall have been submitted to the affected States * * * and approved by the Congress.

To my mind that provision evidences the good faith of the proponents, the forthrightness of the State of New Mexico, if you please. It is conclusive evidence that my State seeks to act in full good faith and with due consideration for its neighboring States. I believe my State always has done that and I am confident it will continue to do so. If I did not believe that I would not be here today urging upon your committee the approval of this bill.

Some of the opponents of the San Juan-Chama project item in this legislation have stated to your committee, in effect, that they feel its enactment would put New Mexico in a position to defraud them of water to which they are entitled under existing compacts. To take that position destroys the good faith and the confidence upon which agreements and compacts are based. It definitely is not now, nor has it ever been, our American way. And so it is that I suggest that your committee disregard objections which are clearly based upon distrust and a fear of sharp practice. That is not New Mexico's way of doing business.

It is true that differences have arisen and still exist between New Mexico and her neighbor, Texas, with regard to the distribution of the waters of the Rio Grande. In fact there is a suit pending in the United States Supreme Court at this time wherein Texas alleges that New Mexico has not delivered the water due the projects below the Elephant Butte Reservoir in accordance with the terms of the 1938 Rio Grande compact.

I shall not attempt to try that case before your committee. Certainly I would not expect you to prejudge a matter that is before the highest court of our land. By the same token I would not expect you to give serious consideration to charges made in that case because it is apparent they must be legally baseless until the case has been adjudicated.

I do feel, however, that it is not attempting to be prejudicial on my part, when I point out to you that, through no fault on the part of New Mexico, there has been an annual loss of between 150,000 and 200,000 acre-feet of Rio Grande water in the swamps of the San Marcial area just north of Elephant Butte. The salt cedars and other phreatic and hydrophitic plants in that area have turned to non-beneficial use more than 50 percent of the flow of the Rio Grande that has reached them from the north. The retardation of the river flow by these swamp areas also has caused increased siltation farther north until now the bed of the Rio Grande is actually 4 feet above the level of the downtown area of the city of Albuquerque. That means additional loss of valuable water for which the State of New Mexico should not be held responsible. Yet the contention is being made that it should be called to account for that lost water.

Nor do I seek to infer that the State of Texas is in any way responsible. The prime responsibility for this deplorable situation, I am forced regrettfully to admit, rests with the Congress. Year after year since I first came to the Congress in 1925—yes, long before that—we have been importuned to do something about this deplorable loss of life-giving water. The Bureau of Reclamation and the Army Corps of Engineers have sounded grave warnings every session of the Congress concerning the dangers of floods and the unnecessary loss of water because of the constantly worsening condition. Proper control of the water by construction of channels, dikes and reservoirs we have been advised by the Nation's best engineers was the only solution. Not until recently have we heeded those warnings and recognized the responsibility of the Federal Government. We have set up an overall Rio Grande program that could cure those ills but we have been so derelict and miserly in providing Federal funds to remedy the situation that the patient may yet die before the operation is completed.

True, the channeling work by the Bureau of Reclamation in the San Marcial area is nearing completion. That alone will save a considerable percentage of that water that has been wasted in the swamplands. But we have yet a long way to go before New Mexico and Texas can derive the full benefit of that great water resource. We must not forget either that the Federal Government is committed to conservation of that water by treaty with the Republic of Mexico under which we are bound to deliver to that nation 60,000 acre-feet of Rio Grande water annually.

It is, indeed, difficult for me to understand—as it must be for you—how the diversion of about 235,000 acre-feet of San Juan River water into the Chama River and thus into the Rio Grande can work an injury on anyone whose livelihood is dependent upon that Rio Grande water. The people of the San Juan area, both Indians and their non-Indian neighbors, have worked out their one-time differences about this diversion project. It took patient and understanding conferences over a considerable period of time for them to reach accord but they did it. There is no reason why the proponents and opponents, as far as this legislation is concerned, cannot do the same. But they must have definite plans on which to reach agreement. That is all this legislation proposes. It will not build 1 foot of ditch or 1 yard of dam until that agreement is reached and the Congress has approved.

Certainly the authorization by the Congress of such surveys and plans as are necessary as the basis for complete understanding is not an unreasonable request. I am confident your committee will not want to delay enactment of such sorely needed legislation.

Senator WATKINS. The committee will now be in recess until 2 o'clock.

(Whereupon, at 12:15 p. m., the committee was recessed, to reconvene at 2 p. m. the same day.)

AFTERNOON SESSION

Senator WATKINS (presiding). The committee will be in session. We will call Mr. Briant H. Stringham, chairman, Colorado River Development Association.

STATEMENT OF BRIANT H. STRINGHAM, CHAIRMAN, COLORADO RIVER DEVELOPMENT ASSOCIATION, VERNAL, UTAH

Mr. STRINGHAM. Mr. Chairman and gentlemen of the committee, my name is Briant H. Stringham. I have lived near the area of the Echo Park Dam site in Vernal, Utah, all my life. My chief business is stock raising and farming. I am presently chairman of the Colorado River Development Association, an organization representing 21 counties, with a population of 400,000. These counties will be directly affected by the Colorado River storage project and participating projects.

It is a great honor and a privilege to appear before this very important Senate committee. Knowing to some extent how fully your time is occupied with important matters of state, I shall be brief. At this time, I would like to submit my full testimony for the record. The following is a short summary of that testimony.

Senator WATKINS. The extended statement will be received.

(Mr. Stringham's statement follows:)

STATEMENT OF BRIANT H. STRINGHAM, VERNAL, UTAH

Mr. Chairman and gentlemen of the committee, my name is Briant H. Stringham. I have lived near the area of the Echo Park Dam site, in Vernal, Utah, all of my life. My chief business is stockraising and farming. I am presently chairman of the Colorado River Development Association, an organization representing 21 counties, containing a population of 400,000 people. These counties are directly affected by the Colorado River storage project and participating projects.

It is an honor and a privilege to appear before this very important Senate committee. Knowing to some extent how fully your time is occupied with important matters of state, I shall be brief.

We of the 21 counties are concerned about the development of potential resources in the West for provision must be made to assimilate the population that is moving westward and at the same time provide for our own best crop, our children.

The conservationists, most of whom are well-intentioned citizens, base their chief argument on the false premise that the building of Echo Park Dam within the Dinosaur National Monument will set a

precedent for the commercial invasion of all parks and monuments. This argument is not based on facts as the following official documents will show. These instruments also prove that it was definitely understood by officials and the people at the time the monument was enlarged that power and reclamation projects were to be constructed inside the monument at some future time, and that the area would be subject to several other existing rights.

For purposes of brevity, I shall refer frequently to the record as set forth in the hearings before Subcommittee on Irrigation and Reclamation of the House of Representatives, serial No. 11, dated January 18 and 28, inclusive. Hereafter I shall refer to this document as "the House hearings."

On June 10, 1920, the Federal Water Power Act was passed creating the Federal Power Commission. This Commission was given authority to grant licenses to construct dams in national monuments according to the opinion given by Councilor Abbott representing the House Subcommittee on Reclamation and Irrigation. Page 722, House hearings. However, on March 3, 1921, the Congress amended the Federal Water Power Act taking from the Power Commission and giving to the Congress authority to grant licenses to construct dams within parks and monuments, but in doing so, the Congress added these significant amendments: (parks and monuments) "as now constituted or existing." Thus leaving the authority in the Federal Power Commission to grant licenses for construction of power dams in newly created monuments such as Dinosaur. President Roosevelt recognized this fact in his proclamation enlarging the monument. See pages 722 and 723, House hearings.

On June 6, 1935, Harold L. Ickes, at that time Secretary of the Interior, addressed a letter to Hon. Frank R. McNinch, Chairman of the FPC suggesting that the Commission release the power withdrawals in the proposed Dinosaur Monument area. In reply to this letter, Chairman McNinch had this to say in substance: "The Federal Power Commission believes that the public interest is this major power resource in the proposed monument area is too great to permit voluntary relinquishment, but the Commission will not object to the creation of a monument if the proclamation setting aside the area contains a specific provision that the development will be permitted." See page 731, House hearings. President Roosevelt granted this request when he issued the proclamation enlarging the monument using these words:

The Director of the National Park Service, under direction of the Secretary of the Interior, shall have the supervision, management, and control of this monument as provided in the act of Congress * * * except that this reservation shall not affect the operation of the Federal Water Power Act of June 10, 1920, as amended, and administration of the monument shall be subject to the reclamation withdrawal of October 17, 1904, for the Brown's Park Reservoir site in connection with the Green River project.

The proclamation reserves the Brown's Park power site and also the Green River project, the latter no doubt referring to Echo Park Dam, as this site had been investigated and recommended by the Department of the Interior under power site classifications Nos. 87 and 93 and withdrawn by the Federal Power Commission under power site reserves Nos. 121 and 721 some years prior to the proclamation enlarging the Dinosaur Monument. (See page 728, House hearings.)

In the Interior Department's USGS Water-Supply Paper 618, entitled "The Green River and Its Utilization" by Ralph R. Woolley, which was released from the United States Government Printing Office in 1930, 8 years before the Dinosaur was enlarged, maps, cross sections, and area and capacity curves are given on reservoir sites along the Green River from the city of Green River, Wyo., to the city of Green River, Utah. Echo Park Dam is included in these investigations as one of the desirable storage and power projects, and had been contemplated for a long period of time, but not until 1930 was the design and specifications made available through the United States Geodetic Survey to the public.

The two important power sites, namely, Echo Park and Blue Mountain (now called Split Mountain) were recognized specifically by the National Park Service and the Federal Power Commission as set forth in a letter addressed to the Federal Power Commission dated at Washington, D. C., August 9, 1934, and signed by A. E. Demaray, Acting Director, and a specific reservation for additional protection of these rights was written into the Roosevelt proclamation to further distinguish them as an existing right and leave their control with the Federal Power Commission (letter, p. 727, House hearings).

On June 11, 1936, at Vernal, Utah, and at Craig, Colo., on June 13, 1936, in mass meetings, both of which I personally attended, David H. Madsen, now a resident of Utah County, but then Acting Superintendent of Dinosaur National Monument, made in substance the following statement in my presence:

If you people will not resist the enlargement of the Dinosaur Monument, I will promise you in the name of the National Park Service that the right to graze the area and the right to construct reclamation and power projects within the area will not be interfered with.

Grazing by both cattle and sheep still continues on the monument under 22 separate permits.

In an affidavit, dated March 27, 1950, Mr. Madsen reaffirms his statement made earlier and the attitude of the Park Service toward dams within the monument, stating in part as follows:

I was authorized to state, and did state as a representative of the National Park Service, that grazing on the area would not be discontinued and that in the event it became necessary to construct a project or projects for power or irrigation in order to develop that part of the States of Colorado and Utah, that the establishment of the monument would not interfere with such development (p. 732, House hearings).

Copies of five supporting affidavits of citizens who attended the meetings mentioned above appear in House hearings on pages 441-443.

In a letter to the late Dr. J. E. Broaddus, one of Utah's outstanding conservationists, under the date of May 2, 1946, the then Director of the National Park Service, Newton B. Drury, has this to say:

I am intensely interested in your statement about the possible beneficial effect of the proposed Echo Park Reservoir in Dinosaur National Monument as a means of access for visitors to see the Green and Yampa Canyons. Dinosaur is one of the few areas in the system established subject to a reclamation withdrawal and this may have some bearing on the proposed Echo Park project * * * we are pleased to have your expression as to the possible beneficial effects (p. 445, House hearings).

In his decision regarding the Dinosaur National Monument controversy, dated June 27, 1950, former Secretary of the Interior Oscar L. Chapman, stated:

Weighing all the evidence in thoughtful consideration, I am impelled in the interest of the greatest public good to approve completion of the upper Colorado River Basin report, including the construction of the dams in question, because (a) I am convinced that the plan is the most economical of water in the desert river basin and therefore is in the highest public interest; and (b) the order establishing the extension of the monument in the canyons in which the dams would be placed, contemplated use of the monument for a water project, and my action, therefore, will not provide a precedent dangerous to other reserved areas' (complete p. 446, House hearings).

January 22, 1936, Governor Blood of Utah wrote Senator King requesting that reservations be made for the development of power, water, and minerals in the proposed monument. May 20, less than 2 months before the monument was enlarged, Congressman Taylor of Colorado was notified by the Park Service that the Secretary had approved the monument enlargement, subject to water power provisions and reclamation withdrawal. May 24, 1938, Senator Johnson of Colorado was likewise notified.

The Bureau of the Budget and President Eisenhower have recently approved authorization of the Colorado River storage project which includes Echo Park Dam. The present Secretary of the Interior, Douglas McKay, after thorough investigation by his Department, has sanctioned the construction of Echo Park Dam, thus two Secretaries of the Interior have made the same decision, under two different administrations. The Interior and Insular Affairs Committee of the United States House of Representatives after long discussion passed favorably on the project.

All these statements and official actions by highly placed Government officials give every reason for public confidence that water development could go forward within the monument and that no precedent would be set, and because of this reliance placed upon such clearly stated agreements, much money has been spent in the belief that they would be honored. On July 10, 1939, a year after the establishment of the enlarged monument, the Colorado River Great Basin Water Users Association, a Utah corporation financed by public funds, made 2 filings in Dinosaur National Monument at a cost of \$1,000 per filing. This association filed on six reservoir sites in the area, including a location called the Island Park Dam, which dam, if constructed would back water up the Green and Yamp canyons approximately the same distance as the Echo Park Dam will do. Also in 1939, the State of Utah appropriated \$62,500 matching Bureau of Reclamation funds, for the resumption of studies and investigations of dam sites in the monument and elsewhere. Studies in the monument, or rather what is now the monument, had begun in 1917, and were accelerated in 1939 after the appropriation by the State of Utah.

I have here before me a photostatic copy of water filing to submit for your information, No. 12934, to appropriate 2,170,000 acre-feet of water for irrigation and a photostatic copy of filing No. 12935 for 11,200 second-feet of flow for power purposes as they appeared in legal notices of the Salt Lake Tribune in 1939.

The Federal Government, through two of its agencies, the Bureau of Reclamation and the National Park Service, along with the people

and the State Government of Utah, demonstrated complete reliance on the broad promises made by the National Park Service, when that Service gave consent to the Bureau of Reclamation to drill and dig test holes and do other work in the monument over the years preparatory to the construction of dams. The ladders up the sides of the cliffs and walls of the canyons still stand as must evidence of this complete reliance. The National Park Service was fully aware of these activities, and would not have permitted this had it not been in agreement with the allowances made for future development of the area.

I have before me a photostatic copy of a front page of the Salt Lake Tribune, dated July 29, 1938, carrying an article dated out of Washington, D. C., entitled "U. S. Enlarges Dinosaur Area in Utah." The following paragraph appears in this article:

Under the order enlarging the monument, grazing will continue in areas which previously have been used by stockmen, and power and irrigation rights will be recognized.

I have before me photostatic copies of front pages from three different issues of the Vernal Express, a local paper published weekly at Vernal, Utah. On July 21, 1938, at the time the monument was enlarged, the Express stated: "In bringing the 318 square miles into the national monument, which heretofore covered only 80 acres, the Park Service agreed to permit the division of grazing to continue operating on the land and and recognized power and reclamation rights." On July 28, 1938, the Vernal Express printed:

J. A. Cheney, cashier of the United States Bank, has worked on the enlargement and the development of the Dinosaur National Monument for a number of years, representing the Vernal Lions. It was through the efforts of Mr. Cheney that the power and grazing rights were protected in the opening of the new scenic region.

And then again on August 4, 1938, the Vernal Express announced in another article:

Under the order enlarging the monument, grazing will continue in areas which previously have been used by stockmen, and power and irrigation rights will be recognized.

Surely all agree that monuments and parks should not be invaded promiscuously. We appreciate the fact that there are two sides to this controversy, but in this case it was definitely understood by all concerned that development within the Dinosaur would some day go forward.

Since the establishment of the original monument in 1915, citizens have listened to glowing predictions of what was going to be done to develop the area to make it one of the most attractive in the entire Park Service system. After 39 years of waiting for something to happen, the monument is still in such an undeveloped condition that it is embarrassing to direct visitors to the headquarters, which is composed of a few lumber shacks. A United States Congressman on a recent visit declared: "This is a national disgrace." The building of Echo Park Dam would create one of the most useful and attractive recreational areas in the United States—something that is needed badly in this day of population pressure.

Our confidence that dams are to be constructed in the monument area are not based upon illusion, but upon many well-documented declarations. There is no precedent set for invasion of parks and

monuments in this case, because the record is replete with documented evidence that Government officials and the people were fully aware that water development would go forward some day in the enlarged Dinosaur National Monument. In asking the United States to break its agreement with its citizens, the wilderness groups are asking the Government, knowingly or not, to stoop to a dishonorable act. In their eagerness to uphold one principle the conservationists are asking their Government to violate another, one that is much more sacred—and this is, the honoring of an agreement, made in good faith to citizens of the United States. We considered the promises made by our Government a sacred trust and we would have opposed the enlargement by every known means at our command had we thought for a moment that the great potential resources of power and water given to us by a gracious providence were to be sealed up forever in the confines of a monument, in a semidesert land where water and its products are the lifeblood of the area.

We people of the West realize that there are two sides to this question. We have implicit faith in the promises made by our Government and the decisions and orders given over the years by highly respected officials as enumerated above, and we firmly believe that our good legislators will see to it that the matter is dealt with honestly and honorably and in such a manner that we may proceed with the development of our potential resources, resources so vast that they were referred to by an eastern Congressman after visiting the area recently, as a "yawning giant," ready to arise. Echo Park Dam in action will contribute to decentralization of industry, add strength to the West, and contribute to a stronger Nation.

Senator WATKINS. You may go ahead with your summarization.

Mr. STRINGHAM. The people who live in the 21 counties of Utah vitally affected by these projects are concerned about the development of potential resources in the West, for provisions must be made, to assimilate the population that is moving westward and at the same time provide for our own best crop, our children.

The conservationists, most of whom are well-intentioned citizens, base their chief argument on the false premise that the building of Echo Park Dam within the Dinosaur National Monument will set a precedent for the commercial invasion of all parks and monuments. This argument is not based on facts as the following official documents will show. These instruments prove that it was definitely understood by officials and the people at the time the monument was enlarged that power and reclamation projects were to be constructed inside the monument at some future time and that the area would be subject to several other existing rights. My testimony will cover the Echo Park Dam problem only.

In 1920 the Federal Power Act was passed giving the Federal Power Commission authority to grant licenses for the construction of water and power projects in national monuments and parks. In 1921, this authority was taken from the Federal Power Commission and given to the Congress in parks and monuments then existing, but the authority continued in the Federal Power Commission to grant licenses in parks and monuments created after that date. And I may add, such as the Echo Park Dam.

On June 6, 1935, Harold L. Ickes, at that time Secretary of the Interior, wrote the Power Commission and asked them to vacate the

withdrawals in the proposed Echo Park Dam enlargement area. Mr. McNinch, then Chairman of the Federal Power Commission, refused to vacate the rights of the Commission in the area, stating in his letter to Secretary Ickes, that power resources in the area were too great to permit voluntary relinquishment and that the Commission would not object to the enlargement of the monument area if the proclamation contained a specific stipulation that the rights of the Federal Power Commission would not be interfered with.

President Roosevelt in enlarging the monument, complied with the above request when he stated in part in the proclamation—

this reservation shall not affect the operation of the Federal Water Power Act of June 10, 1920, as amended.

We trust, Mr. Chairman, that in your perusal of this matter that you will not let technical, legal interpretations interfere or supersede the moral obligations that the people think are couched in these promises.

This reservation shall not affect the operation of the Federal Water Power Act of June 10, 1920, as amended.

In the Interior Department's USGS Water Supply Paper 618 dated 1930, maps, cross sections, and area and capacity curves are given on the Echo Park Dam and Split Mountain structures. A. E. Demaray, Acting Director of the Park Service in 1934, recognized specifically Echo Park Dam and Blue Mountain—now called Split Mountain Dam—in a letter to the Federal Power Commission.

On June 11, 1936, at Vernal, Utah, and again at Craig, Colo., on June 13 mass meetings were held by the Park Service, both of which I attended.

David H. Madsen, then acting superintendent of the Dinosaur National Monument, had charge of these meetings and promised the people in both instances that power and reclamation projects could go forward after the enlargement of the monument.

Mr. Madsen reaffirmed this statement in an affidavit dated March 27, 1950. Newton B. Drury, Director of the National Park Service, in a letter to Dr. J. E. Broadus, recognized reclamation withdrawals in the Dinosaur National Monument.

January 22, 1936, Governor Blood, of Utah, wrote Senator King, requesting that reservations be made for the development of power, water, and minerals in the proposed monument. May 20, less than 2 months before the monument was enlarged, Congressman Taylor, of Colorado, was notified by the Park Service that the Secretary had approved the monument enlargement subject to waterpower provisions and reclamation withdrawal. May 24, 1938, Senator Johnson, of Colorado, was likewise notified. Former Secretary Oscar L. Chapman, after a hearing held April 5, 1950, relative to the enlargement, was in favor of the construction of Echo Park Dam, and stated, in part—

the order establishing the extension of the monument, contemplated use of the monument for a water project, and my action, therefore, will not provide a precedent dangerous to other reserved areas.

Secretary of the Interior Douglas McKay, after a thorough investigation, as recommended by his predecessor, Mr. Chapman, now strongly recommends the construction of Echo Park Dam as an indispensable part of the Colorado River storage project. Thus, two Sec-

retaries of the Interior have made the same decision under two different administrations. President Eisenhower and the Interior and Insular Affairs Committee of the House of Representatives have approved its construction. Great reliance was placed on all of the above-mentioned promises and decisions by the Park Service, by the Bureau of Reclamation, and, most of all, by the people.

On June 10, 1939, a water organization of Utah made two filings in the monument area, at \$1,000 per filing. The same organization filed on six reservoir sites. I would like to refer the committee to pages 447-448 of the House hearings, wherein those filings were reprinted.

The State of Utah in the same year appropriated \$62,500 for investigational work in the area, matching funds with the Bureau of Reclamation. The Bureau of Reclamation spent much time and money over the years in drilling and exploration work on the Echo Park Dam site. None of this activity was opposed by the Park Service.

The Vernal Express, a local paper, carried four separate articles, each stating specifically that water and power rights were reserved at the time of the enlargement. I have here photostatic copies of the issues referred to. I should like to submit them for your information.

(The articles referred to follow:)

[The Vernal Express, Vernal, Uintah County, Utah, Thursday, July 21, 1938]

UNITED STATES EXTENDS UINTAH BASIN DINOSAUR AREA

The Dinosaur National Monument in Uintah County, Utah, and Moffat County, Colo., Wednesday had been enlarged by 203,885 acres with the signing of an order to that effect by President Roosevelt.

The announcement was made by the National Park Service and carried in an Associated Press dispatch from Washington.

The new land is rich in scenic, archeological, and scientific features, Park Service officials said.

In bringing the 318 square miles into the national monument, which heretofore covered only 80 acres, the Park Service agreed to permit the division of grazing to continue operating on the land and recognized power and reclamation rights.

The new area is traversed by the scenic Green and Yampa Rivers. Several hundred caves are located in the region and archeologists assert these once were the homes of cave dwellers.

Park Service officials said they planned to hold road building to a minimum to preserve the wilderness but would construct horseback trails into the more isolated regions.

[The Vernal Express, Vernal, Uintah County, Utah, Thursday, July 28, 1938]

DINOSAUR AREA TO BE SCENIC ATTRACTION—INCLUDES AN AREA OF 318 SQUARE MILES OF MOST PICTURESQUE RIVER CANYON SCENERY IN NORTH AMERICA. TO BECOME ADDED ATTRACTIONS TO DINOSAUR

"The Dinosaur Museum some day will be as big an attraction to tourists as Yellowstone National Park," are the words of Dr. Barnum Brown, world-famous anthropologist and curator of the Museum of Natural History at New York, during a visit at Vernal some time ago. The enlargement order signed last week by President F. D. Roosevelt brings this prediction much nearer to reality.

The order created of the obscure area of 80 acres a region of 203,885 acres, extending from the present Dinosaur National Monument along both sides of Green River, taking in the famous canyons to within a few miles of Brown's Park. It also includes an area up the Yampa Canyon to within 5 miles of Lily Park. The boundary line runs west 2 miles from the Dinosaur quarry, north 4 miles, east 8 miles, and follows a northeasterly directly about 1 mile

from the river. Three-fourths of the area is in Colorado while only one-fourth is in Utah.

J. A. Cheney, cashier of the Utah State Bank, has worked on the enlargement and the development of the Dinosaur National Monument for a number of years, representing the Vernal Lions Club. It was through the efforts of Mr. Cheney that the power and grazing rights were protected in the new scenic region.

Arno B. Cammerer, director of the National Parks Service, under whose direction the new scenic area was created, has conferred with the Dinosaur committee of the Lions Club regarding the planning of the new scenic area.

In the near future an administrative force for the new area will be located here to oversee development work to be undertaken, according to a letter from the Park Director.

The Dinosaur National Monument is world famous and in its undeveloped condition attracts on the average of 1,000 visitors a month, according to Dr. A. C. Boyle, superintendent. During the month of June there were 1,300 registered visitors, he said.

The name of the new scenic region will be the Dinosaur-Yampa Canyon National Monument, according to a letter received by Mr. Cheney.

The State road commission will be asked to improve the road between Jensen on U. S. 40 and the quarry, as the initial step in a program to encourage people to visit the quarry.

Preliminary work is about completed on the proposed quarter-of-a-million-dollar museum which will house the dinosaur bed in bas relief. When the museum is finally completed, the prediction of Dr. Brown will see its fulfillment and tourists by the thousands will come from all parts of the world to spend days at the world-famous dinosaur home.

Mr. STRINGHAM. Thus, you see, that the President of the United States, the States of Colorado and Utah, and the people living in the affected States, in approving the enlargement, firmly relied on those promises made by the United States Government.

The conservationists, well-intentioned as they may be, are asking our Government to stoop to a dishonorable act in their eagerness to uphold one principal while asking the violation of another much more sacred—the violating of a promise made to its people by the United States Government. We, the people of the West, realize there are two sides to this matter. We also know that you, our representatives, will solve the matter in an honorable and intelligent manner. We know, too, that you realize no matter what section of our great country you represent, that water in the arid West is the lifeblood of the economy of the people and that these great dams with lifegiving water behind them and power sites beneath them will add strength, satisfaction, and comfort to all the people and strengthen a great Nation.

Senator WATKINS. Thank you, Mr. Stringham.

Mr. G. E. Unterman, director, Utah Field House of Natural History, Vernal, Utah, will be the next witness.

Mr. Unterman?

STATEMENT OF G. E. UNTERMANN, DIRECTOR, UTAH FIELD HOUSE OF NATURAL HISTORY, VERNAL, UTAH

Senator WATKINS. Will you give us something about your background?

Mr. UNTERMANN. Mr. Chairman and members of the committee, I am G. E. Untermann, director of the Utah Field House of Natural History. I am also a geologist and former ranger at Dinosaur National Monument.

With Mrs. Untermann, also a geologist, we have mapped the geology of the entire area.

When I revised this statement last May, I had in mind burdening you gentlemen with the entire discourse. However, in the meantime, I have learned that it will be in the interest of all of us to save time. So I am referring—

Senator WATKINS. I think it would be in the interest of the project to save time, because if we are going to consider it at this session, we have to move promptly and get our report out of committee and on to the floor of the Senate.

Mr. UNTERMANN. I am using the new material which you will find underlined for ready reference. I refer to the old material which already appears in the House hearings report of January on pages 414 to 436. I make reference to that only to coordinate what I have to say and give some semblance of order to the discussion.

On the first two pages of the old report, I try to bring out that much of the opposition was misleading and irresponsible, uniformed and certainly, to say the least, fantastic. To give some idea of how fantastic it is, we need only refer to the fact that initially, the subject of the inundation of dead dinosaurs was a very live issue. Now we find that the wilderness people tell us that they never made any such claim and that we have executed the neat trick of transforming dinosaurs into red herrings.

It is a cinch that we never started that rumor because we are still busy reducing it every day. The next two pages were devoted to an account of some more of these fantastic claims, wholly unfounded, and to some discussion of the river trips.

Before I go on, I would like to share with you perhaps the wackiest objection to Echo Park that has been made. This conversation actually took place in an eye doctor's office in Hartford, Conn. The gentleman designated as Mr. X is an executive of a nationally known insurance company with headquarters in that city. The person who gave it to me is Mrs. Gerrie O'Connor, who also lives in West Hartford.

Mr. X (sitting next to Gerrie in waiting room). Have you read Perspective in this issue of Newsweek?

GERRIE. No, I haven't.

Mr. X. Here, read it.

GERRIE. Sorry sir, but my eyes are pretty fuzzy at the moment.

Mr. X. Yes, yes. Well, this man Raymond Moley, know him?

GERRIE. Not personally, only his writing.

Mr. X. That's what I mean. Now he gives all the true facts about the proposed dams in Dinosaur National Monument. Know anything about that?

GERRIE. A little.

Mr. X. Well I'm against the whole project.

GERRIE. Why?

Mr. X. Why? The facts speak for themselves. Moley says they shouldn't be built and I believe him. Especially since it's in Utah.

GERRIE. It's in Colorado. But what's wrong with Utah.

Mr. X. Why, its full of Mormons.

NURSE (who overheard the conversation). Mormons; is that bad?

Mr. X. Well, darn it, nurse, of course it's bad. Those Mormon men work all their wives like dogs.

GERRIE. And of course your source of information is—

Mr. X. The best, the best. Didn't I see, with my own eyes on TV those polygamists they rounded up in the canyons out west? I hope they never get dams or anything else that will help them until they abolish polygamy.

NURSE. If you find any lost marbles around here, I'll be glad to return them to their rightful owner.

In all fairness to the river pilots, whom the Sierra Club would have you believe they don't need, we gladly concede that these competent men know their business and can supply the adventurer with thrills with reasonable safety. This is not, however, to subscribe to the insidious propaganda of the Sierra Club that anyone can blunder into the river and come through unscathed without the services of an experienced boatman. If the Sierra Clubbers want to commit suicide by going through the canyons without guides, that is their business. But if they encourage such foolishness for others they are guilty of homicide. Bluntly stated, anyone who would attempt such a venture should have his head examined. In Jack Breed's article in the March 1954 issue of National Geographic entitled "Shooting Rapids in Dinosaur Country," Bus Hatch, the ace riverman who took the club through, has this to say:

This river is strictly a one-way street. Once we enter the canyon of the Yampa, there's no turning back. So if any of you fellows want to reconsider. * * *

Then at Big Joe Rapids, where waves are 8 to 10 feet high, the boatmen studied the maelstrom to seek a safe passage through it. Logs were thrown into the river to see how the whirlpools acted. In one foaming cauldron the log never came up. "Stay out of that one," yelled Bus. All this on only the Yampa River which is considered the "dude's" ride.

Farther downstream on the Green River, Bus commented—

I've run boats through all the canyons of the West. Through the Grand Canyon, the San Juan, the Snake, the Salmon. But none has any worse sections than you'll find through Split Mountain Canyon today.

Below Moonshine, in another rapid (probably S. O. B.) Jack Breed writes:

We tipped badly, but slid off. Had we been in wooden boats, we would certainly have cracked up and lost all our cameras and gear, if not our lives.

Nor do the Sierra Clubbers advertise that while they were on the river, another party of boatmen capsized at Moonshine Rapids and struggled in the water for an hour before they finally fought their way to shore. Attached to this statement, for the records, are letters and telegrams from other river runners, including some who took the Sierra Club through in 1953, and who certainly do not agree with those who are attempting to make the trip through the canyons sound so serene.

One of these letters is from a boatman who rescued a Sierra Club woman from drowning and who was awarded an honorary life membership in the club for his feat. This near fatal accident did not inspire the sympathies of a fellow woman member of the party who vehemently said of the drowning victim, "She would do something like that, just when we're trying to prove how safe the river is."

Probably the kindest thing we can say about these unrealistic people is that they lack practical sense and are wholly devoid of sound judgment.

History makes strange bedfellows, and we find that Nature is working things around to a point where the Sierra Clubbers and wilderness people are very aptly to be in our camp shortly. The Yampa River is so dry that we will have to suspend further boating for this year. We wouldn't be at all surprised if the Sierra Clubbers and

nature boys don't immediately plead for the construction of Echo Park Dam so they will have some water in those canyons to float their boats.

In spite of all the attempts to create the impression that running the rivers of Dinosaur National Monument is a sport for infants, invalids and the infirm, such trips will never be popular with the general public and this portion of the monument's interior will remain little known. At present, 99 percent of the visitors see and use only 1 percent of the monument. Our opponents will tell you that they can show by simple arithmetic that I don't know how to figure percentages. But for their information I would like to state that I am counting only the regular tourists, not the so-called conservationists who flock there for propaganda purposes, and who with great fanfare invade the wilderness portion of the area to build up an impressive attendance. Before the controversy over the dams arose, these people were seldom heard of out in our country, and after this hullabaloo dies down, will probably never be seen again.

Along with the construction of Echo Park Dam the Department of the Interior, through the National Park Service, plans the expenditure of \$21 million to develop the recreational facilities and to make the area accessible to all instead of a limited number. It will then see a real use by the public and share in the attendance which is now almost wholly confined to the quarry and headquarters section of the monument.

If wilderness groups have jeopardized the lives of their own families in a foolhardy attempt to prove that the rivers are safe for just everyone, they have wasted their time.

Now I will turn the page to 8.

The club members are told that they know the facts, but one of the facts that they think they know isn't a fact but a fallacy. Alternate dam sites of proven acceptability do not exist, and even General Grant III, who suggested some of the sites, conceded that the Bureau of Reclamation will have to make the final choice. It is to be hoped that the conservation means the wise use of the Nation's resources.

Any alternate dam site, worthy of consideration, must do at least the following things: (1) Adequately fulfill the purpose of the dam being replaced; (2) keep evaporation losses at a minimum; (3) must have comparable reservoir capacity; (4) must be where water and power can be economically utilized; (5) must impound the waters of the Yampa River; (6) must inundate a minimum of property having economic value. Finding an alternate which has these minimum requirements has failed to materialize.

The charge has been repeatedly made by this group, in text and pictures, that "these canyons will be filled with water." The dam that would fill these canyons with water would be the eighth wonder of the world and would dwarf all other seven wonders of the ancient world combined.

The lakes produced by Echo Park Dam will modify the character of the canyon country but will little affect their grandeur and scenic qualities.

At that point I would like to digress just one moment, with your permission, to refer to page 734 of the House hearings in January, and read a few passages from the statement by Frederick Law Olmstead,

the distinguished landscape architect, under the heading "Survey of Recreation Resources in the Colorado River," with the particular emphasis on Dinosaur National Monument. After mentioning that the alteration will probably not make the Park Service happy, he goes on to say and I quote :

Nevertheless, the canyon unit would still have scenic and recreational values of notable importance and of nationwide interest. I venture to cite a few examples.

The canyon of Lodore—

and this applies equally well to the other canyons—

in general roughly V-shaped in section, is so deep that raising the water in its bottom by 100 to 500 feet or thereabout would hardly diminish its great impressiveness to a susceptible degree.

Then to continue on in the same paragraph and quoting again :

But it cannot be denied that if the area is deliberately made a multiple use area, for power developments plus any recreational values compatible therewith, a great many more people can and will derive pleasure and inspiration of a high order from traversing the canyon of Lodore in boats on a flordlike lake than would even be able to see it all in a more perfectly natural state by shooting its dangerous rapids in boats or by following the 25 miles or more of narrow trail that might with difficulty be contrived to traverse it without much scarring of natural conditions.

Then going on and mentioning the park values of Dinosaur National Monument, he continues :

It is not so unique and precious for such purpose in the sense that Zion National Park, for example, and the scenic and recreational values which it would have if so administered would not be so largely sacrificed by the introduction of waterpower developments contemplated by the Bureau of Reclamation as to give very strong grounds for opposing those economic developments, if and when it becomes clearly evident that the installation of some or all of those waterpower developments would produce economic values of social importance, largely and certainly in excess of the economic cost of producing them.

Under those conditions, it would be reasonable for the Park Service to approve changing the legal status of the unit from that of a national monument to that of a multiple-use area, devoted to the storage and regulation of water and production of waterpower and also to the full extent compatible with reasonably efficient performance of that function, to conserving and utilizing the potentially great scenic, recreational, and related values of the area.

The wilderness fraternity seems to be confused in their own minds as to just what they do believe. In one breath they tell us we are all wet when we talk about canyons two and three thousand feet deep, and in the next they talk about "walls that rise vertically 2,000 feet above the water."

As pointed out by C. R. Henderson, Vernal, Utah (see attached) they can't even agree among themselves on the height of their pet, Steamboat Rock, and have it varying anywhere from 650 to 800 feet, while the official elevation of the highest point is actually 1,006 feet above the river level.

General Grant adds to the confusion by apparently not knowing whether he is going upstream or down, when at a former congressional hearing he stated, as part of his testimony, that—

I would like to point out that Echo Park Dam would flood such areas as Island Park, Rainbow Park, and Little Park.

For the information of you gentlemen so you may be properly oriented, you will be interested to know that these areas are from 10 to

15 miles below Echo Park. The dam would have to "bust" before these areas became flooded.

This is the way it was given at the hearing. In the meantime it has been corrected in the printed report. But it merely goes to show that General Grant like all the rest of us is human and certainly not infallible.

Not satisfied with protesting the purported destruction of scenic grandeur in these canyons, nature groups now rush to a last-minute defense of the bottomlands along the streams and tell us that we are ruthlessly destroying the balance of nature and wiping out biotic communities. The area affected is so small as to be negligible, while these same values are represented in abundance elsewhere within the monument and on the outside. In their grave and exaggerated concern over the fate of willows, cottonwoods, and boxelders, which consume and transpire large quantities of water which could better be used in the service of man, wilderness groups have failed to recognize that man himself is also a child of nature, and as such, is entitled to at least a little consideration by them.

Although entomologists tell us that there are at least 625,000 different kinds of insects in the world, this didn't keep one nature enthusiast from telling us that we were callously murdering the bugs by flooding the bottom lands along a portion of the stream beds of the monument. My heart bleeds for this crawling vermin, but if the water backed up by Echo Park Dam will drown a few million of the wood ticks which cause the often fatal Rocky Mountain spotted fever out in our country, it is just another reason for building it that we entirely overlooked.

In the national park system is already encompassed an area nearly as large as the State of Maine. We asked the question of how much wilderness do the wilderness people want. Canadian national parks preserve an area larger than Scotland or nearly 30,000 square miles. The National Forests of the United States administer a wilderness of approximately 20 million acres with a like acreage in Alaska. These are classified as wilderness areas, wild areas, and natural areas, and by themselves alone should keep all the nature enthusiasts in the Northern Hemisphere happy for many generations to come. The rugged State of Idaho has 3 million acres of primitive area set aside in the national forests which are accessible only by saddle trail. This vast acreage is sufficient to make thousands of wilderness seekers eat many of their meals standing up and cause many more to sleep on their tummies.

Not satisfied with fencing off great wilderness tracts in the continental United States with its enveloping tactics, the Sierra Club was caught in a sneak attack on vast open spaces in Alaska. Two years ago an Alaskan got wind of what the Sierra Club was trying to do and when he called at club headquarters in San Francisco the officers were highly embarrassed that their plan had become known and admitted that they were trying to keep it a secret. Their reason for trying to sew up still more wilderness, they said, was because "It won't be long before you will build roads all over Alaska, and people will be living everywhere. Then it will be too late to establish a wilderness area."

Again we ask, "How much wilderness do the wilderness people want?" There are no roads and no development of any kind in 99 percent of Alaska and these conservationists are worrying about the

vanishing wilderness. There are many effective wilderness areas held by the Federal Government in Alaska. In addition to the national forests already mentioned, there are also Glacier Bay National Monument, Katmi National Monument, and McKinley National Park. These constitute some of the largest land holdings the United States has anywhere in the world. Alaskans say that under the administrative policies of the Federal Government, these areas bid well to be permanently withheld from any useful purpose as nothing is being done with them. One of these areas, Glacier National Monument, is so wild that an enemy could capture and hold it for years without anyone knowing that it was occupied.

We are aware, of course, that the major objection of conservationists to the dams in Dinosaur, the opposition which looms up largest, stems from the purported threat to a National Park Service area by commercial interests and the alleged violation of principles and precedents. There are two sides to this story so far as the monument is concerned. The wilderness people have steadfastly contended that our side of the story is of no importance and carries no weight.

We feel, however, that each case should be judged on its own merits. There is more to the enlargement of the monument than meets the eye, as will be brought out by other testimony and ample evidence will be submitted to show that we have every reason to place faith in the promise that such enlargement would not interfere with grazing or water and power development on the streams.

Some of this has already been brought out by Mr. Stringham. What a lot of people never knew, or have forgotten, is that the initial expansion program started out as a vastly larger scheme. The original idea was to make a wildlife area out of the region and as such it took in a great deal more territory. Indeed, it took in just about all the sagebrush flats and hills in the surrounding country and bore no resemblance to any plan presuming to preserve scenic and recreational values. The vigorous protest of the local people, both in Utah and Colorado, shrank the boundaries to approximately their present limits. The monument's New Look resulted from confining the envelopment of the region to the four major canyons, Lodore, Whirlpool, and Split Mountain on the Green River and Bear Canyon on the Yampa, with control areas reaching back several miles from both rims.

A terrific uproar has been made over the charged violation of a principle and the claim that an undesirable precedent will be established in the construction of Echo Park Dam. I do not know beans about legal procedure, but I don't believe it will take a Philadelphia lawyer to establish the fact that these people do not know what they really are objecting to.

I fail to see the logic of the nature groups' argument that a precedent is involved in permitting the construction of Echo Park, when they already concede that the Brown's Park Dam, recognized by President Roosevelt in his proclamation enlarging the Monument, would not involve such a precedent nor would it involve any violation of Park Service principles.

A dam within a National Park Service area is a dam no matter where it is located, so far as precedent is concerned. What these people are really objecting to is not a dam but its location. Brown's Park Dam being in upper Lodore Canyon, near the boundary of the Monument, would affect only a small portion of Dinosaur. Echo

Park Dam, in upper Whirpool Canyon, would modify the bottom of both Lodore and Bear Canyons and increase the affected area.

This, then, is the real objection. If the wilderness people would base their case on location instead of precedent they would be getting things into their true perspective. But can you imagine anyone raising a national hullabaloo over the location of a dam when no objection can honestly be made to the dam itself? As long as you can get misinformed people to believe that their national park system is being violated you have a much stronger case for fanatical objection than if you came right out and said that, "What we are objecting to is that they are going to back water up Canyon A and B instead of only Canyon A, and for heaven's sake write the President, write Churchill, write Malenkov, that they are destroying our national park system with such a dangerous precedent."

Since conservation groups so violently resent the presence of man-made structures in the wilderness, I wonder if anyone has told them that the Park Service, itself, at Dinosaur, is about to plant a number of Japanese tea gardens, polite term for outdoor comfort stations, at various places in the wilds, for the convenience of the dudes. Perhaps it is still not too late for our friends to whip up national sentiment against this outrageous desecration of nature which may well lead to the establishment of a precedent violating all that is holy and sacred to those who worship at the shrine of the primitive.

Prehistoric Indian sites, mainly Basket Maker II and III, ranging from 200 to 700 A. D., are widespread in northeast Utah and northwest Colorado, both inside the Monument and outside. There is no danger of erasing lost civilizations as a result of Echo Park Dam. They are too well represented elsewhere in the region. In the attached statement, Dr. Jesse D. Jennins, head of the anthropology department, University of Utah, and one of the intermountain's outstanding archeologists, shows that if salvage of archeological values is carried out ahead of inundation, and there is ample time for this, there is no reason to oppose construction of the dam.

In our 5-year survey of the Monument we could find no minerals of economic importance. This includes oil and uranium.

Senator WATKINS. Will you tell us how long you spent in the Monument?

Mr. UNTERMANN. Well, sir, I have lived in or near the Monument for over 30 years. Mrs. Untermann was born there and raised there. Our combined service in Dinosaur National Monument as members of the Park Service is about 7 years. But the geological survey that we conducted at the request of the Park Service required 5 years.

Senator WATKINS. Both you and your wife are geologists.

Mr. UNTERMANN. That is correct.

Senator WATKINS. And you were working for the National Park Service during that time?

Mr. UNTERMANN. Yes, sir.

Incidentally, I wanted to mention that this report is now in press and should appear next month as bulletin 42 of the Utah Geological and Mineralogical Survey.

Senator WATKINS. Thank you.

Mr. UNTERMANN. The formations which produce oil elsewhere in the region are exposed on the surface at Dinosaur and do not have a sufficient cover to trap oil if it were present in the first place. For-

mations from which uranium is being recovered in commercial quantities in southeast Utah and southwest Colorado are present in the monument but apparently do not carry such values. Common minerals, such as copper, iron, lead, et cetera, occur so scantily as to produce only prospect holes and give no promise of having any commercial value. An independent investigation will easily verify the truth of these statements. Attached are letters signed by seven prominent intermountain geologists who support the above views and who conclude by saying:

All geologic information believed to be worthwhile at present is, therefore, at hand * * *, it is unreasonable to anticipate that any impediments to research will be thrown up as a result of the dam construction and the impounding of waters back of it.

This requires an explanation. This is a statement from a member of the Sierra Club, who happens to be a friend of mine, and who doesn't see eye to eye with the club. He goes on to say:

I have openly stated my views on Echo Park Dam to many club members, and in 9 cases out of 10 they have not written their Congressmen or Senator because they do not feel that they are in a position to pass judgment on the merits of the project, and realize they are being told how to think by the club leaders, and they don't like it. One member asked a lady who held up her hand in answer to a request for a show of hands of members who had written letters in opposition to Echo Park, where Echo Park Dam was and what she thought the Sierra Club had to do with it in the first place. She didn't know where the dam was and parroted a few of the club's stock objections. Here we have a woman who doesn't even know what the score is, yet she feels qualified to write her Congressman and tell him how to vote.

Those of us who favor Echo Park have written principally in an attempt to offset the flood of letters you have received against it. We didn't want you to get the impression that all the interest was on one side. With such a tidal wave of telegrams in opposition, Western Union certainly missed a good bet by not having a convenient stock message which read:

Dear Senator or Congressman: I have been told that Echo Park will ruin Dinosaur National Monument—so I'm opposed to it. Please tell me, what is an Echo Park and where is Dinosaur National Monument?

My most unpardonable sin, in the eyes of the wilderness people, is that I, a museum man who himself preserves the beauties of nature, should be on what they are pleased to call the wrong side in this controversy. My reply has been, and will continue to be, that it merely goes to show that one can love nature and still be rational about it.

In view of all the consideration that has been given to posterity, I only hope they appreciate it when they finally arrive. I am sure they will be far more grateful to those forebears who leave them a means of making a living than to those of whom it can only be said, "They left us a wilderness."

This concludes my statement.

Senator WATKINS. Do you desire to put into the record this other material?

Mr. UNTERMANN. Yes, sir.

Senator WATKINS. That will be the order.

(The statement referred to follows:)

STATEMENT BY G. E. UNTERMANN, DIRECTOR, UTAH FIELD HOUSE OF
NATURAL HISTORY, VERNAL, UTAH

During the course of the hearings in January, before the Irrigation and Reclamation Subcommittee of the House Committee on Interior and Insular Affairs, in connection with comparison House bills (H. R. 4449, H. R. 4443, and H. R. 4463) I made an extensive statement on the subject of the Echo Park unit of the Colorado River storage project. The hearings are printed; and my testimony appears in them at pages 414-436. In order to save this committee's time, I shall not repeat that statement. I have with me copies of a statement entitled "Realism and the Dinosaur National Monument Controversy." This is substantially the same as the statement that I made before the House committee. I have brought it up to date. I do not ask, however, that it be reproduced in these hearings. It is my purpose at this time to deliver a brief draft of that statement for the records of this committee.

Much of the objection that has been raised to the use of a small part of the Dinosaur National Monument for the proposed Echo Park Reservoir arises from misinformation as to what the effect on the monument may be. In fact, nothing of great value or significance will be obliterated and the monument will be made much more readily and safely accessible to the general public than it is today.

Alternate sites that will do the job of Echo Park do not exist, and the authorization of the Echo Park unit will not set a precedent for the similar use of any other national park or monument area.

REALISM AND THE DINOSAUR NATIONAL MONUMENT CONTROVERSY

(By G. E. Untermann, director, Utah Field House of National
History, Vernal, Utah)

Frederick C. Othman generally tries for humor in his syndicated newspaper column. In 1950 when he wrote about the Echo Park Dam and the Dinosaur National Monument hearing before the Secretary of the Interior he was funnier than even he knew. Listen to this: "On the rocky walls of the river are the footprints of the giants that roamed the jungles in an ancient age. These marks are known as petroglyphs."

In the first place there are no known dinosaur footprints in the monument. In the second place they wouldn't be going up the sheer canyon walls, if there were; and in the third place, a petroglyph isn't a dinosaur footprint in the first place. Petroglyphs are cliff murals of prehistoric Indians. This form of primitive art incised on the sandstone walls of canyons, represent for the most part ceremonials and hunting scenes. They have nothing to do with dinosaurs.

Mr. Othman goes on to say that Camarasaurus was the only dinosaur to come from the monument. Actually, there were 12 different types recovered from this world famous quarry.

I do not cite these inaccuracies to ridicule Mr. Othman. I mention them only to show how irresponsible, misguided, and uninformed some publicity can be and how such misinformation can cause a nationwide protest over something that doesn't amount to a hill of beans.

It is unfortunate that much of the widespread objection of the conservationist and wilderness lover, in this heated controversy over dams versus dinosaurs, scenery, and violated principles, has been of this careless nature.

Congress does not have time to look into the merits of every protest and anguished outcry of the folks back home and has a right to assume that such complaints are based upon more than petulance and poorly authenticated sources of information. When someone sees a bunch of kids in space helmets and starts a nationwide hullabaloo over the heavy and unregulated traffic to Mars, flooding an overworked Congress with letters and telegrams in protest, Congress in self-defense can only assure the outraged citizenry that such travel will be regulated and will not be permitted at all unless, and until, foot-long hot dogs, Coca-Cola, and a comfort station are available at least every 100 miles.

Conservation groups have reluctantly conceded that the dinosaurs are in no danger at the monument as a result of the proposed dams. However, this false rumor was once widely broadcast and accepted by the general public as a justifiable reason for opposing the project. The wilderness people now tell you that they never made any such claim and that we have executed the neat trick of transforming dinosaurs into "red herring." Nevertheless the belief still lingers in some quarters and refutation is required almost daily. Rumor is more relentless than truth so that the maligned victim seldom lives down its invidious effect.

Some other claims and charges of the opposition groups have been as baseless and fantastic as the "Save the Dinosaurs" movement, and just as misleading. These people are natural-born crusaders who are always ready to "save" anything which they feel is worthy of their best efforts. Having gone off half-cocked with respect to the dinosaurs which they found snug and comfy where they are, they proceeded to come to the valiant defense of western outlaws whom they felt were in danger of historical "liquidation." We were soon to learn that the proposed dams in Dinosaur National Monument would flood such famous bandit hideouts as Hole-in-the-Wall and Robber's Roost. It was quite a shock to these well-meaning saviors when they were informed that Hole-in-the-Wall is in the Powder River country of northern Wyoming, 150 miles away from the monument, and that Robber's Roost is in the San Rafael Swell of Utah, at least 150 miles to the south.

Undaunted by two false starts, the "old college try" was given to a great emotional appeal. Someone thought he had figured out a sure-fire protest that wouldn't boomerang. Since the eccentric old hermit, Pat Lynch, had lived in the area now bearing his name, Pats Hole, it seemed safe to assume that he died there. And if he died there, he must be buried there. So we were told, "That surely you wouldn't bury a poor old Irishman under 500 feet of water. Have you no reverence for the dead? Is nothing sacred to you?" There was great gloom in camp when we informed our friends that Pat wasn't buried in Pats Hole. In fact, what was worse, he wasn't even buried in the monument. Several years before Pat was called to the Great Beyond a fellow Irishman by the name of Moran, an early exponent of free private enterprise, chased Pat from the holdings on which he had squatted, with the persuasive muzzle of a 30-30. Pat went

to live with the Baker family in Lily Park, 50 miles up the Yampa River, where he was buried, high and dry, in 1917. But even in death the fates were unkind to Pat, for the only other occupant in the burial plot with the old Irish Catholic was a Mason. And adding insult to injury, the Masonic emblem was carved on his neighbor's tombstone. On quiet evenings, when not a breath of air is stirring, the sagebrush growing on these desolate graves can be seen to shake violently, and from this we know that these departed souls still have not reconciled their earthly differences.

With true missionary zeal nearly 200 members of the Sierra Club, in three separate groups, came to Vernal in the summer of 1953 to make the trip through the canyons of Dinosaur National Monument under the guidance of competent river pilots. Their avowed purpose was to enjoy the thrill and excitement of the river run, but a member of the first group spilled the beans by revealing the real purpose. He stepped forward and made the following introduction: "We represent the Sierra Club of California and we have come to Vernal to save Dinosaur National Monument for you people so they won't build those dams in there." "Well," I replied, "that's certainly very nice of you, and I'm sure you are prompted by the best motives, but did it ever occur to you that we might not want to be saved? As it so happens, we don't. We want to be dammed."

Headlines and pictures in the second edition of the Sunday Los Angeles Times, under date of August 30, 1953, clearly showed what the Sierra Club was up to. "Children in Boats Run Utah Rapids. Californians Refute Claim That Wild Green River Is Dangerous," blared the bold type.

The text of the article would lead one to believe that infants kick the slats out of their cribs and cry for a trip down the Great River. That sweet old ladies drop their knitting to man the boats dashing through the canyons. But all these people were passengers, not river runners. A corpse could make the trip if Bus Hatch, ace riverman, wanted to take it through. No ability is required of the passengers other than that they can get in and out of the boats, and if an infirmity prevents this, they can be lifted in and out. While most of the Sierra clubbers made the entire trip, some of them left the river at Island Park or Rainbow, rather than go through Split Mountain Canyon which has a couple of sockdolager rapids. Moonshine, the upper rapids, has had its loss of life, and SOB lower down has shared in disaster. For politeness sake, SOB is pronounced "sob," as in cry, but when used by rivermen has the same meaning given it by Harry Truman in speaking of music critics. When approaching such rapids it is too late to exclaim, "Oh, mamma! Why did I ever leave home?" There is only one thing to do and that is to go on down the river. Making the run through the canyons is like marriage: You don't know what you're getting into until you make the trip. In all fairness to the river pilots (whom the Sierra Club would have you believe they don't need), we gladly concede that these competent men know their business and can supply the adventurer with thrills with reasonable safety. This is not, however, to subscribe to the insidious propaganda of the Sierra Club that anyone can blunder into the river and come through unscathed without the services of an experienced boatman. If the Sierra clubbers want

to commit suicide by going through the canyons without guides, that is their business. But if they encourage such foolishness for others, they are guilty of homicide. Bluntly stated, anyone who would attempt such a venture should have his head examined. In Jack Breed's article in the March 1954 issue of National Geographic entitled, "Shooting Rapids in Dinosaur County," Bus Hatch has this to say: "This river is strictly a one-way street. Once we enter the canyon of the Yampa, there's no turning back. So if any of you fellows want to reconsider——." Then at Big Joe Rapids, where waves are 8 to 10 feet high, the boatmen studied the maelstrom to seek a safe passage through it. Logs were thrown into the river to see how the whirlpools acted. In one foaming cauldron the log never came up. "Stay out of that one," yelled Bus. All this on only the Yampa River, which is considered the "dude's" ride.

Further downstream on the Green River Bus commented, "I've run boats through all the canyons of the West. Through the Grand Canyon, the San Juan, the Snake, the Salmon. But none of them has any worse sections than you'll find through Split Mountain Canyon today." Below Moonshine, in another rapid (probably SOB), Jack Breed writes: "We tipped badly but slid off. Had we been in wooden boats, we would certainly have cracked up and lost all our cameras and gear, if not our lives."

Nor do the Sierra clubbers advertise that while they were on the river, another party of boatmen capsized at Moonshine Rapids and struggled in the water for an hour before they finally fought their way to shore. Attached to this statement for the records are letters and telegrams from other river runners, including some who took the Sierra Club through in 1953, and who certainly do not agree with those who are attempting to make the trip through the canyons sound so serene. One of these letters is from a boatman who rescued a Sierra Club woman from drowning and who was awarded an honorary life membership in the club for his feat. This near fatal accident did not inspire the sympathies of a fellow woman member of the party, who vehemently said of the drowning victim, "She would do something like that, just when we're trying to prove how safe the river is!"

Probably the kindest thing we can say about these unrealistic people is that they lack practical sense and are wholly devoid of sound judgment.

In spite of all attempts to create the impression that running the rivers of Dinosaur National Monument is a sport for infants, invalids, and the infirm, such trips will never be popular with the general public and this portion of the monument's interior will remain little known. At present 99 percent of the visitors see and use only 1 percent of the monument. Our opponents will tell you that they can show by simple arithmetic that I don't know how to figure percentages. But for their information I would like to state that I am counting only the regular tourists, not the so-called conservationists who flock there for propaganda purposes, and who with great fanfare invade the wilderness portion of the area to build up an impressive attendance. Before the controversy over the dams arose, these people were seldom heard of out in our country, and after this hullabaloo dies down will probably never be seen again.

Along with the construction of Echo Park Dam the Department of the Interior, through the National Park Service, plans the expenditure of \$21 million to develop the recreational facilities and to make the area accessible to all instead of a limited number. It will then see a real use by the public and share in the attendance which is now almost wholly confined to the quarry and headquarters section of the monument.

If wilderness groups have jeopardized the lives of their own families in a foolhardy attempt to prove that the rivers are safe for just everyone, they have wasted their time. No one has advocated building the dam because it will produce safe stillwater bodies. Placid lakes will be the result of the dam being built, not a reason for building it. Any attempt to justify it on such a flimsy pretext would be utterly ridiculous. The dam is needed for stream regulation, hold-over storage, power development, etc. Echo Park Dam, particularly, is one of the most important sites on the entire river system and meets all the requirements of adequacy. Nature has provided good dam sites sparingly and these must be used where they are.

Postmarked December 18, 1953, the president of the Sierra Club sent the following frantic message to members:

Urgent; Immediate action needed! Secretary of Interior McKay has just recommended to President Eisenhower the destruction of Dinosaur National Monument—construction of Echo Park Dam. Arguments of conservationists have been passed by. Alternative sites exist that will spare the national park system. What to do: Write (as an individual) or wire the President. White House, Washington, D. C., asking that he act to protect the national park system and disapprove dams in Dinosaur. Send a copy to your Congressman (and your chapter chairman, please). There is no time to lose. You know the facts; more will follow. The next bulletin will suggest further steps for you to take. Every conservationist must speak at once. The chips are down for sure.

The club members are told that they know the facts, but one of the "facts" they think they know isn't a fact but a fallacy. Alternate dam sites of proven acceptability do not exist, and even General Grant III, who suggested some of the sites, concedes that the Bureau of Reclamation will have to make the final choice. It is to be hoped that the conservationists will be equally gracious for it is my understanding that true conservation means the wise use of the Nation's resources.

Any alternate dam site, worthy of consideration, must do at least the following things: 1. Adequately fulfill the purpose of the dam being replaced. 2. Keep evaporation losses at a minimum. 3. Must have comparable reservoir capacity. 4. Must be where water and power can be economically utilized. 5. Must impound the waters of the Yampa River. 6. Must inundate a minimum of property having economic value. Finding an alternate which has these minimum requirements has failed to materialize.

The claim of the wilderness people that the dam will destroy the scenic and inspirational values of the canyon portion of Dinosaur National Monument is wide open to serious challenge. The charge has been repeatedly made by this group, in text and pictures, that "these canyons will be filled with water." The dam that would fill these canyons with water would be the eighth wonder of the world and would dwarf all other seven wonders of the ancient world combined. Let us take a realistic look at the situation and see what we really have. At Echo Park Dam the water will actually be 500 feet deep, plus or minus. Whirlpool Canyon, in which the dam site is

located, rises 2,500 feet above this point. Thus the canyon depth will be diminished one-fifth at the dam. In Lodore Canyon, the deepest and most rugged of all canyons of the monument, the average depth of reservoir water will approximate 350 feet, while the walls rise more than 3,000 feet, resulting in a diminution in height of only one-tenth. On the Yampa River the placid lake will not even go all the way through the canyon but will leave rushing white water at the upper end. If our friends had said that the dams will fill the bottoms of the canyons they would have made a factual statement. What they overlooked in their eagerness to be alarming, was the fall of the river itself which causes backed-up water to become shallower as you go upstream. The lakes produced by Echo Park Dam will modify the character of the canyon country but will little affect their grandeur and scenic qualities.

The wilderness fraternity seems to be confused in their own minds as to just what they do believe. In one breath they tell us we are all wet when we talk about canyons 2,000 and 3,000 feet deep, and in the next they talk about "walls that rise vertically 2,000 feet above the water" (Stephan Bradley in the Roundup Section of the Denver Post, January 31, 1954). As pointed out by C. R. Henderson, Vernal, Utah (see attached), they can't even agree among themselves on the height of their pet, Steamboat Rock, and have it varying anywhere from 650 to 800 feet, while the official elevation of the highest point is actually 1,006 feet above the river level.

General Grant adds to the confusion by apparently not knowing whether he is going upstream or down, when at a former congressional hearing he stated, as part of his testimony, that, "I would like to point out that Echo Park Dam would flood such areas as Island Park, Rainbow Park, and Little Park." For the information of you gentlemen so you may be properly oriented, you will be interested to know that these areas are from 10 to 15 miles below Echo Park. The dam would have to "bust" before these areas became flooded.

Not satisfied with protesting the purported destruction of scenic grandeur in these canyons, nature groups now rush to a last minute defense of the bottomlands along the streams and tell us that we are ruthlessly destroying the balance of nature and wiping out biotic communities. The area affected is so small as to be negligible, while these same values are represented in abundance elsewhere within the monument and on the outside. In their grave and exaggerated concern over the fate of willows, cottonwoods and boxelders, which consume and transpire large quantities of water which could better be used in the service of man, wilderness groups have failed to recognize that man himself is also a child of nature, and as such, is entitled to at least a little consideration by them.

Although entomologists tell us that there are at least 625,000 different kinds of insects in the world, this didn't keep one nature enthusiast from telling us that we were callously murdering the bugs by flooding the bottomlands along a portion of the stream beds of the monument. My heart bleeds for this crawling vermin, but if the water backed up by Echo Park Dam will drown a few million of the wood ticks which cause the often fatal Rocky Mountain spotted fever out in our country, it is just another reason for building it that we entirely overlooked.

Wilderness groups also object to lakes in Dinosaur for still another reason. They say, "How will posterity be able to tell by what means the canyons were formed if the living streams which carved them are no longer active?" If when posterity stands on the rims of the monument and can't tell that the canyons they are looking at were carved by stream action, they will be mighty dumb and certainly no credit to their progenitors.

The fact that the alpine glaciers which carved the high Sierras and Yosemite are not longer active, does not impair the enjoyment of the Sierra Club and others, of this majestic area. It is for this very reason that the area is accessible to large numbers just as the canyon areas of the monument will become easily accessible after the rivers which formed them have been tamed in their headlong flight to the sea.

The terrific fuss and fury over the partial inundation of Steamboat Rock, in Echo Park, would mislead one to believe that this was the only scenic feature in the whole of Dinosaur National Monument. Nothing is ever said about some of its other magnificent areas which are unaffected by proposed dams. So flagrant is this omission by writers on the area who are in opposition to Echo Park, that I felt impelled to make the following reply to one staunch defender who sent me his article, "This Is Dinosaur," in the hope of converting me to his viewpoint. "Although your article is entitled, 'This Is Dinosaur,' I note that you make no mention at all of Dinosaur Quarry and the Headquarters area, while the wilderness section is featured entirely. The wilderness area of the monument is vast by comparison with the Quarry area, but it is, nonetheless, secondary in importance to the Quarry development. Unless the dam is built, in our opinion, the primitive area of the monument will remain relative unimportant, as it is today, so far as sharing in the number of visitors is concerned.

I also note another glaring omission, conspicuous by its absence, especially since you are writing entirely about the primitive portion of Dinosaur National Monument. You utterly fail to mention the Jones Hole area. For the most part, itinerant scribes like yourself, will visit those areas of the monument which can be reached while sitting on soft cushions, even if it wrecks a car to get you there, but we can't get you into an area which involves a horseback ride and may mean that you're going to have to eat off the mantelpiece. Jones Hole, probably the most spectacular and scenic wilderness section in the monument, has received the most consistent and persistent 'brush off' of any area in the region. And yet, it has been considered worthy of setting apart as a national monument by itself alone. Its location and solitude, its lack of gas fumes and horn blowing, are the very things which should make it irresistible to you wilderness people who are always yelling that you want to get away from it all. Well, here's your chance. Better come back and take another look at Dinosaur National Monument and finish your job. Jones Hole is something you'll really rave about, and best of all, it is unaffected by any dam.

Let's get some realism into this thing and quit the visionary day-dreaming which may make for poetic writing but which certainly ignores the facts as though they were a plague.

It can be said for this particular writer that he did spend a week or more at the monument gathering material for his article. Most of them camp there only overnight and then rush home to dash off a "masterpiece" on why Echo Park Dam will ruin Dinosaur.

I have lived in or adjacent to Dinosaur National Monument for over 30 years and with Mrs. Untermann, also a geologist, have mapped the geology of the entire monument. This application entitled "Geology of Dinosaur National Monument and Vicinity, Northeast Utah, Northwest Colorado," is now in press and should appear soon as Bulletin No. 42, of the Utah Geological and Mineralogical Survey. Mrs. Untermann was formerly a ranger-naturalist at Dinosaur and I have been a ranger there. In spite of our long association with the region and our intimate knowledge of it, there still are a lot of things we do not claim to know about it. How these hit-and-run scribes, who only camp overnight and then take a potshot at the monument, can know so much is too deep for me.

The rivers of the monument now inundate 3 percent of the area. After both Echo Park and Split Mountain Dams are constructed only 11 percent of the entire region will be inundated, leaving the remaining 89 percent a wilderness untouched by man. Does this sound like the destruction of Dinosaur National Monument? It does, however, raise the old question of just how much wilderness do the wilderness people want. In the national park system is already encompassed an area nearly as large as the State of Maine. Canadian national parks preserve an area larger than Scotland, or nearly 30,000 square miles. The national forests of the United States administer a wilderness of approximately 20 million acres with a like acreage in Alaska. These are classified as wilderness areas, wild areas, and natural areas, and by themselves alone should keep all the nature enthusiasts in the Northern Hemisphere happy for many generations to come. The rugged State of Idaho has 3 million acres of primitive area set aside in the national forests which are accessible only by saddle trail. This vast acreage is sufficient to make thousands of wilderness seekers eat many of their meals standing up and cause many more to sleep on their tummies.

In Utah 71 percent of the land is federally owned, which includes 2 national parks, 9 national monuments, and 7 national forests. No one out in that country is going to shed any tears over the modification of a small portion of this Federal land, especially when it makes the area more accessible and advances the development of a rapidly expanding West.

Not satisfied with fencing off great wilderness tracts in the continental United States with its enveloping tactics, the Sierra Club was caught in a sneak attack on vast open spaces in Alaska. Two years ago an Alaskan got wind of what the Sierra Club was trying to do and when he called at club headquarters in San Francisco, the officers were highly embarrassed that their plan had become known and admitted that they were trying to keep it a secret. Their reason for trying to sew up still more wilderness, they said, was because, "It won't be long before you will build roads all over Alaska, and people will be living everywhere. Then it will be too late to establish a wilderness area." Again we ask, "How much wilderness do the wilderness people want?" There are no roads and no development of any kind in 99 percent of Alaska and these conservationists are worrying about the vanishing wilderness. There are many effective wilderness areas held by the Federal Government in Alaska. In addition to the national forests already mentioned, there are also Glacier Bay National Monument, Katmai National Monument, and McKinley National Park. These constitute some of the largest landholdings the United States has any-

where in the world. Alaskans say that under the administrative policies of the Federal Government, these areas bid well to be permanently withheld from any useful purpose as nothing is being done with them. One of these areas, Glacier National Monument, is so wild that an enemy could capture and hold it for years without anyone knowing that it was occupied. (See attached copy of editorial from the Anchorage Daily Times.)

Thomas Munro in his discussion of the Esthetic Appreciation of Nature, has this to say :

A man who must wrest a difficult living from the land is forced to take a different attitude toward it from that of the leisurely vacationist. He must, in other words, take a practical attitude toward Nature.

The vacationist enjoys our rugged mountains and scenic splendor for 3 months out of the year, then he goes back home to make his living where things are easier. The native lives out there the year round and has to make his living where he is. These people who are opposing the development of our country only come there to play. We have to work there. You can't blame a man like Ebernezer Bryce, for whom spectacular Bryce Canyon was named, for not going overboard for the scenic aspects of the region when he took a more practical attitude by saying: "That it was a hell of a place to lose a cow." If some of this vast western wilderness can be put to work doing something useful instead of being merely ornamental, it should not be looked upon as a national calamity.

That having fun is the primary object of most of these visitors to our picturesque West is shown by the statements of some who are honest enough to give their real reasons for opposition to dams in Dinosaur National Monument. Dr. Russell G. Fraser, an ardent river runner, comes right out and makes no bones about it when he says, "I may be selfish in my viewpoint but I like to run rivers and if you fellows build those dams in there you'll spoil my fun."

Miss Mildred E. Baker, in the 1950 autumn number of the Living Wilderness says practically the same thing in different words. Stating her opposition to Split Mountain and Echo Parks Dams, she concludes :

* * * forever making it impossible for anyone to enjoy the thrills of fighting the river and pitting their puny strength against all the forces of the wilderness.

We are aware, of course, that the major objection of conservationists to the dams in Dinosaur, the opposition which looms up largest, stems from the purported threat to a national park service area by commercial interests and the alleged violation of principles and precedents. There are two sides to this story so far as the monument is concerned. The wilderness people have steadfastly contended that our side of the story is of no importance and carries no weight. We feel, however, that each case should be judged on its own merits. There is more to the enlargement of the monument than meets the eye, as will be brought out by other testimony and ample evidence will be submitted to show that we have every reason to place faith in the promise that such enlargement would not interfere with grazing or water and power development on the streams. When a lot of people never knew, or may have forgotten, is that the initial expansion program started out as a vastly larger scheme. The original idea was to make a wild-life area out of the region and as such it took in a great deal more territory. Indeed, it took in just about all the sagebrush flats and

hills in the surrounding country and bore no resemblance to any plan presuming to preserve scenic and recreational values. The vigorous protest of the local people, both in Utah and Colorado, shrank the boundaries to approximately their present limits. The monument's "new look" resulted from confining the envelopment of the region to the four major canyons, Lodore, Whirlpool, and Split Mountain on the Green River and Bear Canyon on the Yampa, with control areas reaching back several miles from both rims.

A terrific uproar has been made over the charged violation of a principle and the claim that an undesirable precedent will be established in the construction of Echo Park Dam. I do not know beans about legal procedure but I don't believe it will take a Philadelphia lawyer to establish the fact that these people do not know what they really are objecting to. I fail to see the logic of the nature groups' argument that a precedent is involved in permitting the construction of Echo Park, when they already concede that the Browns Park Dam (recognized by President Roosevelt in his proclamation enlarging the monument), would not involve such a precedent nor would it involve any violation of park service principles. A dam within a national park service area is a dam no matter where it is located, so far as precedent is concerned. What these people are really objecting to is not a dam but its location. Browns Park Dam being in upper Lodore Canyon, near the northern boundary of the monument, would affect only a small portion of Dinosaur. Echo Park Dam, in upper Whirlpool Canyon, would modify the bottom of both Lodore and Bear Canyons and increase the affected area. This, then, is the real objection. If the wilderness people would base their case on location instead of precedent they would be getting things into their true perspective. But can you imagine anyone raising a national hulla-baloo over the location of a dam when no objection can honestly be made to the dam itself? As long as you can get misinformed people to believe that their National Park System is being violated you have a much stronger case for fanatical objection than if you came right out and said that, "What we are objecting to is that they are going to back water up canyon A and B instead of only canyon A, and for heaven's sake write the President, write Churchill, write Malenkov, that they are destroying our national park system with such a dangerous precedent."

Since conservation groups so violently resent the presence of man-made structures in the wilderness, I wonder if anyone has told them that the Park Service, itself, at Dinosaur, is about to plant a number of "Japanese tea gardens," a polite term for outdoor comfort stations, at various places in the wilds, for the convenience of the dudes. Perhaps it is still not too late for our friends to whip up national sentiment against this outrageous desecration of nature which may well lead to the establishment of a precedent violating all that is holy and sacred to those who worship at the shine of the primitive.

What of archeological and mineral values which may be partially inundated by dams in the monument? Archeological exploration at Dinosaur dates from 1921. The principal work of study and excavation was carried out by the University of Colorado Museum in cooperation with the National Park Service. Considerable material has been recovered, especially in the Castle Park area, with papers covering the work published by the University of Colorado Press in

1948 and 1951 (The Archeology of Castle Park and Excavations at Hells Midden Dinosaur National Monument). Prehistoric Indian sites, mainly Basket Maker II and III, ranging from A. D. 200 to 700, are widespread in northeast Utah and northwest Colorado, both inside the monument and outside. There is no danger of erasing lost civilizations, as a result of Echo Park Dam. They are too well represented elsewhere in the region. In the attached statement, Dr. Jesse D. Jennings, head of the anthropology department, University of Utah, and one of the intermountain's outstanding archeologists, shows that if salvage of archeological values is carried out ahead of inundation (and there is ample time for this), there is no reason to oppose construction of the dam.

In our 5-year survey of the monument we could find no minerals of economic importance. This includes oil and uranium. The formations which produce oil elsewhere in the region are exposed on the surface at Dinosaur and do not have a sufficient cover to trap oil if it were present in the first place. Formations from which uranium is being recovered in commercial quantities in southeast Utah and southwest Colorado are present in the monument but apparently do not carry such values. Common minerals, such as copper, iron, lead, etc., occur so scantily as to produce only prospect holes and give no promise of having any commercial value. An independent investigation will easily verify the truth of these statements. Attached are letters signed by seven prominent intermountain geologists who support the above views and who conclude by saying:

All geologic information believed to be worthwhile at present is, therefore, at hand * * *, it is unreasonable to anticipate that any impediments to research will be thrown up as a result of the dam construction and the impounding of waters back of it.

The grave concern over the presence of economic minerals in Dinosaur National Monument has always been a source of secret amusement to us. If the monument were made of uranium and was studded with diamonds, no one would be permitted to develop these resources, because they would be in a Park Service area. The same uproar over "invasion" and "precedents" would be furiously hurled by the conservationists as are now being hurled over the proposed dams. While the Park Service would permit no "development" at Dinosaur, the local stockmen claim that the monument has a development project of its own—that of raising coyotes, mountain lions, and bobcats to prey on their young stock. The Park Service has a wild-life publication which shows that coyotes don't eat sheep. An autopsy was made of the stomachs of a couple of coyotes which proved that they ate only rabbits, prairie dogs, and other natural food animals. However, one of the stomachs contained a strange and exotic item—a shoelace. From this we must conclude that while the particular coyotes did not eat any sheep at the time of their examination, one of them certainly must have eaten the herder.

In this concern over "inundated values," the Park Service has inadvertently introduced an item of confusion on its own. On page 47 of the National Park Service report which forms a portion of the 1950 Colorado River storage project report, under "Geological program" is the following:

To excavate two important dinosaur sites in Echo Park and Split Mountain Canyon, respectively; recovery, preservation, and storage of artifacts and plan for subsequent public exhibit.

Twenty-five thousand dollars annually, for a 2-year period, are requested to make this study.

I wrote the then Secretary of the Interior pointing out the error in referring to this material as dinosaurs. Inasmuch as the canyons referred to are carved in formations which antedate the dinosaurs of the monument by at least 100 million years, no fossil dinosaurs could be present. The Assistant Secretary replied that they regretted the error and that the statement should have read "fossils" instead of "dinosaur fossils." I in turn replied that using only the term "fossils" was still very confusing, since any fossil in the monument would immediately be interpreted as a dinosaur fossil by the average reader. It would be better to say what they meant, which was invertebrate fossils; in other words, marine mollusks of the carboniferous period. We had had such a difficult time refuting the rumor that dinosaurs would be flooded by proposed dams, that we didn't want to see this bugaboo raise its head again through the use of any misleading language. Besides, \$25,000 a year seemed to give these "seashells" an exaggerated importance which they certainly do not merit and which was sure to cause additional needless controversies. Especially when the same material in exactly the same beds could be studied in many other localities within the monument and on the outside. Within the monument the identical geology, stratigraphic layers, and invertebrates occur at these among other places: Round Top, Martha Peak, Tanks Peak, Bear Valley, Thanksgiving Gorge, East Cactus Flat, Douglas Mountain, Zenobia Peak, Wild Mountain, Harpers Corner, and Jones Hole. Outside the monument these same fossils can be studied on Diamond Mountain, Lena Peak, Brush Creek Mountain, Taylor Mountain, and others, all of which are wholly unaffected by any dams proposed in the area. This duplication of values within the monument and on the outside is typical of practically every feature which seems to cause some quarters so much needless concern, and applies not only to the geology, fossils, and archaeology, but to faunal, floral, and mineral values as well. This makes one wonder what all the shouting is about.

It comes as no great surprise that conservationists are divided among themselves over this controversy and that such groups as would normally be expected to aline themselves with the wilderness people, because of their aesthetic appreciation of nature, are not opposed to the dams in Dinosaur National Monument. In our State we have such organizations as the Federated Artists, Associated Garden Clubs, Federated Women's Clubs, Wildlife Federation, and the Wasatch Mountain Club who do not go along with the conservationists. (See attached, "Some Views of the Wasatch Mountain Club, Salt Lake City.") Even individual members of opposing groups can't stomach some of the antics of the leaders of these organizations. Listen to this, from a member of the Sierra Club, no less:

I do not see eye-to-eye with the club. The entire club is led by a few who do the thinking for them and hold sway over the membership. A speaker at a recent meeting told of a film Boom Town which showed the vice and immorality that goes with boom conditions of a large project. They were going to use this film to discourage the people in the vicinity of the dam from supporting this sort of thing in their midst. Well, Vernal has gone through the oil boom O. K., so I guess they can maintain law and order while the dam is being built. I think reclamation is in its infancy and should not be blocked

by a few individuals, or groups led by a few individuals, who know nothing of the needs of a land so far away.

I have openly stated my views on Echo Park Dam to many club members, and in 9 cases out of 10 they have not written their Congressman or Senator because they do not feel that they are in a position to pass judgment on the merits of the project, and realize they are being told how to think by the club leaders, and they don't like it. One member asked a lady who held up her hand in answer to a request for a show of hands of members who had written letters in opposition to Echo Park, where Echo Park Dam was and what she thought the Sierra Club had to do with it in the first place. She didn't know where the dam was and parroted a few of the club's stock objections. Here we have a woman who doesn't even know what the score is, yet she feels qualified to write her Congressman and tell him how to vote.

Those of us who favor Echo Park have written principally in an attempt to offset the flood of letters you have received against it. We didn't want you to get the impression that all the interest was on one side. With such a tidal wave of telegrams in opposition, Western Union certainly missed a good bet by not having a convenient stock message which read:

Dear Senator or Congressman: I have been told that Echo Park will ruin Dinosaur National Monument—so I'm opposed to it. Please tell me, what is an Echo Park and where is Dinosaur National Monument?

My most unpardonable sin, in the eyes of the wilderness people, is that, I, a museum man who himself preserves the beauties of nature, should be on what they are pleased to call the wrong side in this controversy. My reply has been, and will continue to be, that it merely goes to show that one can love nature and still be rational about it.

In view of all the consideration that has been given to posterity, I only hope they appreciate it when they finally arrive. I am sure they will be far more grateful to those forebears who leave them a means of making a living than to those of whom it can only be said, "They left us a wilderness."

SALT LAKE CITY, UTAH, *January 29, 1954.*

HON. WILLIAM A. DAWSON,

House of Representatives, Washington, D. C.

DEAR MR. DAWSON: This letter is in supplement to our wire of yesterday concerning the current controversy regarding Echo Park Dam.

Each of us has written previous letters concerning the aspects of this matter, of which we have personal knowledge. However, it has come to our attention that, as part of the so-called conservation testimony, considerable capital has been given to the claim that, in future years, Dinosaur National Monument may be made a tourist attraction primarily through the use of boat trips down the river.

This contention is as ridiculous, in our opinion, as is most of the testimony which has been given by conservation groups speaking without personal knowledge of the monument. No one who has traversed the waters of the Yampa and the Green Rivers through the Dinosaur National Monument can possibly claim that those waters are safe to casual travel during high water.

As mentioned in our wire, on June 20 last, 7 of us capsized at the top of Split Mountain Gorge on the final day of a 5-day boating trip down the Yampa and Green Rivers from Lily Park, Colo., to Jensen, Utah. Our party was composed entirely of men between the ages of 35 and 45, all in good health. The leader of our party is a man who has devoted a good portion of his adult life to river

running, who has made 12 to 15 trips down this very stretch of river, and who has traversed most of the white water in the Western States. Two more of us had made this same trip the previous year. All of us have spent considerable time outdoors and in the primitive areas of the West.

We were going down the river this year in an Army pontoon, which, as you know, is approximately 20 feet long, with 20-inch rolls on the side, a craft which few people would believe capable of capsizing. However, on the fifth day of our trip, right at the bottom of Moonshine Draw Rapids in Split Mountain Gorge, the boat, despite the efforts of the two men at the oars, was swept over a rock and capsized into a hole behind the rock. Two of the party were thrown clear of the boat. The rest were drawn back into the rock several times before the boat pulled away. The two who were thrown clear managed to make it to shore just above the next rapids, appropriately named S. O. B. None of us on the boat had any idea that the two thrown clear had or could reach shore safely, just as we did not believe, through our knowledge of the river, that we could live hanging onto the overturned boat going through S. O. B. Rapids and the succeeding white water and rapids.

We were approximately 30 or 35 minutes in the water clinging to the overturned boat in an effort to get it to shore, but were unable to do so through that entire section of the river. At the end of that time we were able to get a rope across the top of the overturned boat and climb on top, in which fashion we rode the last rapids. We were just over an hour from time time we capsized until we came ashore at the southern end of the monument. During that time those of us who had stayed with the boat were convinced that the two men who had been thrown clear could not have gotten through that stretch of river alive. It may be interesting to know that experienced rivermen told us later that they would never have expected anyone to live through that water at that stage of the river.

For 3½ hours we were unsure of the fate of the others in the party until search planes which we chartered and others sent out by the Parks Department located the party which had been stranded upriver. They were subsequently rescued.

This experience moves us all to protest most strongly any testimony that this river can be considered safe for any but fully equipped healthy adults. We assure you that, although we all hope to make the trip again this year, we are going to go, as always, fully equipped, and that if the water looks to us as it looked last year, we fully intend to walk around that particular portion of the river.

We certainly feel that there are many aspects of this Echo Park controversy which may be more sensibly debated than the safety of the river from a recreational standpoint. We are, of course, as we have indicated in previous letters, strongly in favor of the Echo Park Dam and the entire central Utah project; but whether or not we were for the Echo Park Dam, we could not condone the testimony given in Washington the past week by so-called conservation forces.

Very truly yours,

ROBERT G. ARNOLD,
919 South 2200 East, Salt Lake City, Utah.
MAX C. SMITH,
1870 Harvard Avenue, Salt Lake City, Utah.
RICHARD F. REED,
1225 Yale Avenue, Salt Lake City, Utah.
ROBERT L. PARKER,
1216 First Avenue, Salt Lake City, Utah.
SALT LAKE CITY, UTAH, February 16, 1954.

To Whom It May Concern:

My name is Harold Twitchell. My reason for writing this letter is to refute the statements I have read about how safe it is for anyone to make a trip down the Green River through the Dinosaur National Monument in a boat without any experience at all. My opinion is that if anyone went through these canyons without a very experienced guide, he should have his head examined.

On June 14, 1948, 4 of us, Arnold Kidd, Erwin Day, Evert Billings, and myself, left Lily Park, Colo., and started down the Yampa River in a 7-man Navy rubber craft. The first day we went to the Mantle Ranch. The next morning we were up early and shoved off. This stretch of water is fairly slow until you get to the junction of the Green River. Then the fun really begins as you must go around Steamboat Rock and then into the Whirlpool Rapids. This 3 miles of whirlpools are very vicious and only by sheer luck were we able to make it to Jones Creek.

At Jones Creek we met a group of fishermen. I tried desperately to get one of their group, anyone, to take my place in the boat. Believe me, I was scared. No one wanted any part of it.

The next morning we took off at 7 a. m. and went to the mouth of Split Mountain. We got out of the boat and looked the rapids over very carefully, as we had every rapid previously. (Little did we know what was in store for us.) We entered our boat and went on our way—and I do mean went. This water moves so much faster than any we had gotten into. We had gone about a quarter of a mile when a rock loomed up before us. We did everything in our power to avoid it, but over we went. I was very lucky as I was able to hold onto the boat. The other fellows were thrown clear. I saw Arnold Kidd and Mr. Billings in the middle of the stream fighting for their lives. That was the last time I saw Mr. Billings alive. Mr. Billings drowned a few minutes later, according to Mr. Kidd. I drifted a mile or so below there and finally was able to get the boat ashore. All this time the boat was upside down. I made my way back upstream where I found Mr. Kidd. Mr. Day had gotten out on the other side of the river. We all finally made our way back for help.

Now let me explain. Mr. Billings had a Mae West life preserver which was fully inflated and strapped on him securely. The next morning we found the life preserver, fully inflated, all straps in place but Mr. Billings was not in it. The reason I mention this is to try to explain how vicious and swift the rapids were.

In closing all I can say is it is a beautiful canyon. It is too bad that a few want to keep it so for a few privileged persons when millions could see it if Echo Park Dam were built.

Anyone who knows me will vouch that I like my sports and have taken active part in conservation, but I feel this river is not only for the few who are brave enough to gamble with their lives. It should be for all who wish to enjoy the marvelous scenery without risking lives.

I would also like to say that I know of 6 boats that have been smashed on this same stretch of water where we had our accident and 4 of those 6 were guided by experienced men.

Sincerely,

HAROLD H. TWITCHELL.

TELEGRAMS TO REPRESENTATIVE WILLIAM A. DAWSON, OF UTAH

VERNAL, UTAH, *January 27, 1954.*

Being an experienced boatman and having made several trips through the canyons of the Green River in the area the Sierra Club says is so safe, I wish to inform you that it is not safe for anyone, and only experienced rivermen should ever attempt it. I almost lost my own life along with four others on one trip. I lived in constant fear last summer while the Sierra Club was on their trip.

WILLIAM H. SLAUGH.

VERNAL, UTAH, *January 27, 1954.*

I was employed as boatman by Bus Hatch during the entire summer of 1953, and was boatman on two of the Sierra Club runs. I personally saved the life of Dot Pepper, a member of the expedition, during the last run. As a result she sent me an honorary membership to the Sierra Club.

JOHN A. HACKING.

VERNAL, UTAH, *January 27, 1954.*

I have run boats through all the gorges in Dinosaur Monument. In the spring of 1951 I ran with the Hatch River group. On this trip 2 boats were upset and 5 men were in the river for about 1½ miles. I personally saved the lives of two

of them. If this river is safe for anyone it needs better boatmen than I have seen on it.

GRANT MERRELL.

VERNAL, UTAH, *January 27, 1954.*

I was the truck and bus driver for the Hatch River expeditions in 1953. At every point where I met the boats on the river I brought out dissatisfied members of the Sierra Club.

DALE J. MERRELL,

VERNAL, UTAH, *January 27, 1954.*

In May of 1951 I was one of a party of 13 men who ran the Green and Yampa Rivers. We started at Linwood, Utah; 3 days later we entered Lodore Canyon and 2 hours later 2 boats with 4 men and myself capsized at Upper Disaster Falls. The five of us were in this terrible water for 1½ miles before we could reach the bank. By the grace of God only we reached the bank before we were battered to death on the thousands of rocks in this wild river. This water is so fast and rough it is impossible for the best swimmer to even attempt to swim. If all five of us had not been lucky enough to have held to the boats we would have all been battered to death. We reached the bank minus one boat and all our provisions.

After making this trip I personally cannot see why any sane person would take it. To think that the National Park Service will permit elderly persons and small children to take this trip is beyond any safe and sane thinking. This river is not safe to swim in even below the canyons where it is running smooth because of the undercurrent. The records show that several people have drowned even in this smooth water. I can see why a few people might make this trip once, but after running the waters of these canyons I cannot see why anyone would want to make a second trip. This entire trip was under the direction of Bus Hatch, veteran river runner, and even with his expert knowledge of the rivers we still almost lost 5 lives.

Sergeant S. J. HATCH,
Utah State Patrol.

VERNAL, UTAH, *January 27, 1954.*

As a boatman I have taken parties through the Yampa and Green Canyons. They are far too rough and dangerous for the average boatman. The few who have gone through were taken by expert boatmen who knew every foot of the river. They ran the safest parts when the water was at the safest stage. Even so there will be people killed in the future as there have been in the past.

LYNN M. POPE,
Vernal, Utah.

STEAMBOAT ROCK DISAPPEARS

What are the nature lovers doing to our Steamboat Rock in Dinosaur National Monument?

In 1941 the Geological Survey, in cooperation with the National Park Service, surveyed and mapped the Dinosaur area, map release as of 1945, showing the top of Steamboat Rock at 6,066 feet, streambed at 5,060 feet, or of that time this massive rock was 1,006 feet high.

Devereux Butcher, field representative of the National Parks Association, in the National Parks magazine of December 1950, somehow disposed of 206 feet of this giant and moved it to only 800 feet high—that made the 500-foot dam more impressive.

Then, somehow, Martin Litton, an official of the Sierra Club, got into Pats Hole and he photographed the great rock down to 700 feet (see p. 378 of the March 1954 National Geographic). No one saw him carry off the top 100 feet which Mr. Butcher left there.

Now comes Phillip Hyde, in cooperation with the Sierra Club, and he takes off another 50 feet by his photograph in Sunset magazine, March 1954. He is very kind. He did not take such a big chunk; he still left us 650 feet of rock and it still looks the same.

Now, I don't know exactly what they did with this billion tons of sandstone, but I think they have been feeding it to some of their associates all over the good United States and calling it "save our scenery."

Now, gentlemen, or nature lovers, will you please bring back that 356 feet of our rock, for we have plans to keep 500 feet of our magnificent Steamboat Rock out of water when the Echo Park Dam is built.

C. R. HENDERSON.

VERNAL, UTAH.

[Anchorage Daily Times, Thursday, February 25, 1954]

OUR VANISHING WILDERNESS

A new clamor for a big land withdrawal in Alaska is a-building down California way, and bids well to become an important issue if it continues.

There is a move being pushed by a handful of men to have a big slice of arctic Alaska set aside as a wilderness area.

If accomplished, it would mean that the area—no doubt huge in extent—would be forever closed to development by man. It would be a sacred spot where wild-life could live undisturbed except by its own predators and diseases. It would have no roads, no mines, no traplines. All things invented and used by man to make the riches of the earth useful would be taboo.

Alaskans will find it difficult to understand why there should be a clamor to perpetuate what Alaskans are so desirous of bringing into production. They can't see why anyone should want more of what Alaska already has so much of.

The revised version of the Alaska statehood bill now pending in Congress protects the Territory from such a land withdrawal at the moment. It promises there will be no new reservations established for at least 5 years. If the bill dies without enactment, the Territory would lose that flimsy protection.

The wilderness area is believed to have been the brain child of a group of mountain climbers in the San Francisco area. The idea came from the Sierra Club, a conservation organization of national repute.

Two years ago an Alaskan called on the officers of that organization and inquired as to their plans. First tip that such a scheme was in the making came when other conservation groups endorsed the idea which had been expressed by the Sierra Club.

The officers were found to have few definite ideas. They were embarrassed that their plan had become known. They admitted that they were attempting to keep it under cover.

The main idea that prompted their scheme was the rapid development of Alaska that they had been reading about.

"It won't be long before you will have roads built all over Alaska, and people will be living everywhere," one officer said. "Then it will be too late to establish a wilderness area."

It is silly to be fearful that all the 586,400 square miles of this vast northland are about to be opened up by road construction. The 99 percent of Alaska's area that is wilderness is undergoing no change because of today's developments.

It is apparent that the move for creating a wilderness areas is based on a false premise.

A further look at the situation shows the scheme is superfluous and unnecessary. There are already many effective "wilderness areas" held by the Federal Government. These include some of the largest landholdings the United States has anywhere in the world. They are Glacier Bay National Monument east of Yakutat, the Katmai National Monument southwest of Anchorage, and the McKinley National Park north of Anchorage.

Each of these huge reservations is a "wilderness area" as it stands. Under the administrative policies of the Federal Government the areas bid well to be permanently withheld from any useful purpose. Nothing is done with them. No new roads are built.

McKinley Park is opened to the public on a limited basis, but only a fraction of the huge area is accessible for lack of facilities. Katmai National Monument is even less accessible and Glacier Bay National Monument could be captured and held by an enemy for years without being discovered.

Why should there be an effort to set aside another huge area as a wilderness, when the project has been achieved so perfectly through past reservations?

Wilderness boosters could contend that creation of the Arctic area would not interfere with the big developments that are coming for Alaska. That may be true.

But the chances are equally strong that the interference could be terrific. Alaska has so many prospects for development, in so many places and in so

many different fields, that there is no place that can be definitely and finally designated as good only for wilderness.

Mineral possibilities are attracting national attention. There is great need for the minerals impregnating Alaska's hills and valleys. They may be found anywhere, and that includes the Arctic as well as the sub-Arctic.

Alaskans have firsthand knowledge of the stubborn jealousy of Federal agencies in regard to their holdings. Only a few years ago a limestone deposit was discovered in a remote and inaccessible mountain at the southeast corner of McKinley National Park. An intradepartmental fight was precipitated when the deposit was under investigation.

The Bureau of Mines was stopped from moving drill equipment into the area. The National Park Service refused to allow the Bureau to cross the park boundaries. Both are Interior Department agencies. Their deadlock went to cabinet level in Washington for adjudication. The Bureau was allowed to drill.

Would a private firm have been allowed to drill? If it had been decided that the limestone should be mined on a commercial basis, would the Interior Department have allowed it?

To Alaskans, wilderness is something to be enjoyed as it is and developed if, as, and when an opportunity is found. A couple of generations from now, the natural wilderness areas may be reduced to a point where steps should be taken to set aside some acreage for perpetuation as such. When that time comes, Alaskans will be glad to have the help of the mountain climbers in San Francisco in the project.

UNIVERSITY OF UTAH,
DEPARTMENT OF ANTHROPOLOGY,
Salt Lake City, January 15, 1954.

Dr. A. RAY OLPIN,
*President, University of Utah,
Campus.*

DEAR PRESIDENT OLPIN: Herewith is my brief response to your request for a statement regarding archaeological resources which would be jeopardized by the construction of Echo Dam in Dinosaur National Monument.

(1) In the portions of the Yampa and Green River Canyons involved in the reservoir there are known to be scores of aboriginal sites, ranging from at least 2000 B. C. to A. D. 500-700. Earlier ones may well be there. More of these known sites lie in the Yampa Valley than in the Green; this reflects only the fact that the Yampa has been surveyed more carefully for cultural material than the Green.

(2) At least two cultures are represented in the area. The earlier, and least spectacular, is the nonagricultural and relatively low-level way of life showing relationships with the material recovered from caves in western Utah and the rest of the arid West.

The second and later manifestation, called the Fremont, is a recognizable, but very poorly understood variant of the Pueblo culture of the Southwest. It is less flamboyant (than Pueblo) in overall development, but was an agricultural, pottery-making culture. In my opinion (and we plan to do research on this problem), the Fremont culture developed from the desert cultures of the arid West and may prove to be of somewhat greater age than the long sequence of better-publicized southwestern cultures. Actually, archaeologists know the potential and wealth of resources more fully than they know the culture of these canyons.

(3) Two good reports of the work at two small sites in Castle Park, on the Yampa, are available. These are:

Burgh, Robert F., and C. R. Scoggin, *The Archaeology of Castle Park Dinosaur National Monument*, University of Colorado Studies, Series in Anthropology No. 2 (1948); and

Lester, Robert H., *Excavations at Hells Midden, Dinosaur National Monument*, University of Colorado Studies Series in Anthropology No. 3 (1951).

A third general report by Marie Wormington on the Fremont culture will soon be available from the Denver Natural History Museum.

In addition there are three extensive manuscript reports of archaeological surveys within Dinosaur National Monument on file at the monument headquarters at Vernal, Utah. These are of value in this connection because these manuscripts contain full inventories of the known aboriginal sites in the reservoir site and other parts of the area.

(4) There is now a precedent—began in the TVA days and continued since World War II—that Government agencies recognize an obligation to salvage,

on a sampling basis, archaeological, historical, and paleontological data threatened with inundation because of reservoir construction. We could expect a similar arrangement, I suspect, in the case of Echo Park Dam. (In fact, this university would perhaps have opportunity to contract to conduct salvage archaeological work in the reservoir area.)

(5) In summary, there are important archaeological values to be considered; these are known and understood in the most limited and incomplete way. These, by precedent, can be salvaged ahead of inundation and the ends of science would thus be served. On purely scientific grounds, therefore, if there is assurance that a sample salvage program will be incorporated into the dam-construction project, there is no reason to oppose dam construction.

If no provision for salvage is made, however, there will be loss of rather significant anthropological data and values—the more important because of our present incomplete knowledge about the remains of the two cultures found in the region. The scientific necessity for arrangements for salvage should be, I think, emphasized as being the crucial factor in the position I have taken.

(6) The above statements are very hastily put together. A more detailed and informative statement can be prepared, if desired, by travel to Dinosaur National Monument, where the detailed survey reports can be consulted.

Sincerely,

JESSE D. JENNINGS.
Head, Anthropology Department.

JANUARY 15, 1954.

Dr. A. RAY OLPIN,
President, University of Utah.

DEAR PRESIDENT OLPIN: The following brief report concerns the geological implications of the Echo Park Dam. It reflects the opinions of the staff of the department of geology.

The dam itself and the waters impounded back of it will not cover the dinosaur bone beds. The dinosaur fossils occur in the Morrison formation, and the site from which the skeletons in the Museum of the University of Utah, in the Carnegie Museum, the Denver Municipal Museum, and the National Museum came, will not be impaired in any way. There is very little fossil material at the monument for the tourist to see at present, but the Park Service has made plans to quarry out in relief the dinosaur bones from a large sandstone slab at the quarry site, and this will make an imposing exhibit when completed. A sheet-metal structure has been built over the slab but excavation of the bones has not yet started because of lack of funds. Professor Stokes of the department of geology, University of Utah, was the chief consultant on the plan, and our curator, Golden York, was to have directed the actual excavation. The site of such proposed excavation is several miles from the proposed dam and the waters collecting back of the dam would extend away from the bone beds and not toward them and over them. Moreover, the Morrison formation extends in belts of outcrop from New Mexico to Montana, and at several places in it various species of dinosaurs have been found. We can see no way in which research on fossil reptiles will be impaired by the building of the Echo Park Dam, and no way in which possible naturally occurring exhibits for the general public will be covered or made less attractive.

The waters will cover short stretches of some of the Paleozoic formations, but only a little more than the present Green River and Yampa River. For the most part the waters will spread along the bottom of the Green River Canyon over the Precambrian Uinta series which makes up the core of the Uinta Mountains. So far no commercial mineral deposits have been found in the Uinta series. No petroleum geologist would spend time on the Uinta series in the search for oil. To the writer's knowledge no uranium deposits have yet been found in it. The percentage of areal exposure that the impounded waters would cover is negligible, and it is entirely improbable that future geological interpretations of structure or stratigraphy would be hampered.

The small extent of the Weber sandstone and underlying shales and limestones that would be covered by the proposed Split Mountain Dam is of no geological concern. Although the Weber sandstone is the chief producer of oil in the nearby Rangely and Ashley Valley fields, the structure at the place where the Weber would be covered by the waters of the dam is not suitable for oil accumulation, and as far as I know, no geologist has designs on the dam site area.

A good topographic and geologic map has been made of the entire Dinosaur Mounment, the geologic map having recently been published (Utah Geological

and Mineralogical Survey, University of Utah). All geologic information believed worthwhile at present is, therefore, at hand: It is probable that research on certain details in the Dinosaur Monument area will be made in the future but it is entirely unreasonable to anticipate that any impediments to research will be thrown up as a result of the dam construction and the impounding of the waters back of it.

Respectfully yours,

A. J. EARDLEY,
R. E. MARSELL,
WM. LEE STOKES,
F. W. CHRISTIANSEN,
N. C. WILLIAMS,
D. J. JONES,

Staff of the Department of Geology.

JANUARY 15, 1954.

President A. RAY OLPIN,
University of Utah, Salt Lake City, Utah.

DEAR PRESIDENT OLPIN: Since coming to Utah as dean of the College of Mines and Mineral Industries I have been vitally concerned with the natural mineral resources of Utah of which water is one. Power is another important aspect of the industrial utilization of the mineral resources of the State.

To one studying the problem it soon becomes evident that water is the most important single resource in the West, largely because of its scarcity in contrast to the abundance of many other raw materials essential to an industrial future. The development of the Colorado River water along sound engineering lines is the most important problem to be solved if the intermountain region of the United States is to contribute the maximum of its potential to the economic welfare of the Nation and the world. It is my firm belief (based on considerable study) that the recommendation of the Bureau of Reclamation is the best engineering solution to this problem and that this proposed program of development was not influenced by motives other than the best possible engineering practice directed to obtaining the maximum productive result from the development of the waters of the Colorado drainage basin.

For this reason I am firmly convinced the Echo Park Dam should be constructed at the earliest possible date.

I am completely at a loss to understand the thinking back of the opposition which has arisen in the name of conservation. One wonders if the stated reason is the real reason for the opposition. The important part of the Dinosaur National Monument—the dinosaur quarry—will in no wise be disturbed, since the lake will form up the river from this quarry. Furthermore, the river above the quarry is now practically inaccessible. Only a few “river rats” traverse the river at this place each year in rubber liferafts, and while traversing it they are much too busy fighting rapids to gain a safe passage through the river to enjoy any of the scenery offered by the sheer canyon walls. Hence this part of the monument offers very much less attraction than would a lake formed by the Echo Park Dam.

A word as to conservation. To me, the term “conservation of natural resources” implies the most beneficial use of these resources for a rapidly expanding national and world population. Not to develop the upper Colorado River in the manner outlined by the Bureau of Reclamation is to waste—fail to conserve—a tremendous natural resource of water and potential power which could be a benefit to thousands every day. All this would be lost so that a dozen or so citizens, yearly, might enjoy (?) a ride in a rubber liferaft over dangerous rapids in a river running between sheer walls of barren rock.

For true conservation and for the best interests of a rapidly developing and growing Nation, we must have a sound engineering development of the upper Colorado River. This contemplates the construction of the Echo Park Dam at an early date.

I hope you will communicate this thought to those interested in the resolving of this problem.

Sincerely,

CARL J. CHRISTENSEN,
Dean, College of Mines and Mineral Industries.

SOME VIEWS OF THE WASATCH MOUNTAIN CLUB, SALT LAKE CITY

The Echo Park-Split Mountain controversy, when its relationship to the development of the upper Colorado River watershed is concerned, quickly loses its deceptive aspect of simplicity. The popular impression of a bureaucratic monster suddenly bent upon a dam-building foray, while superior sites are available elsewhere, is likely to undergo substantial revision.

Not only is this area in our backyard—the current dispute is not without an ominous portent for our front ones as well.

Some persons will learn, to their surprise, that the first reconnaissance undertaken in behalf of the Dinosaur Monument expansion found the Bureau of Reclamation already planning for a dam at Echo Park. Test drilling for the dam's foundation antedated by more than a year the inclusion of the area in the monument.

National-park officials assured the inhabitants of the region that development of water resources would not be impeded, and a stipulation for construction was included in the order for the monument's expansion. As quoted by the Secretary of the Interior, "It contemplated the use of the monument for a water project."

The present conflict between inherently idealistic organizations presents a golden opportunity to enemies of the Bureau, and these implacable foes, now cloaked by association in a mantle of righteousness, contribute insidiously to gain their own unholy ends. Thus it is not surprising that the zealous conservationist should lapse into the line of attack of his predatory allies.

One favored subject is "construction costs which exceed project estimates." The intended inferences are probably a lack of reliability in the Bureau's cost data, and deliberate underestimating to more easily secure congressional approvals.

Some embarrassment from estimate errors is freely admitted, but when a completed project report is subjected to committee hearings, investigations, etc., for a period often exceeding 4 years, before it is even presented to Congress, this type of error, during an inflationary period, can hardly be regarded as reprehensible. If there be any real basis for the second innuendo, it becomes less a reflection on the integrity of the Bureau of Reclamation than on the vision of Congress, which, in its dereliction, is ever mindful of the desires of the powerful "taxpaying" utilities, and has shackled this category of public works with heavy repayment requirements.

Other comparable endeavor, such as "noncompetitive" harbor activity, and the levee building "antics" of our flood control specialists, the Army Corps of Engineers need make no repayment at all.

One example of increased project cost which is cited, employs a stratagem worthy of a politician. The Colorado-Big Thompson project was plagued with difficult construction problems, and ran the gamut of the inflationary spiral as well. It is truly stated that the increase in costs over the original estimate is too large to be accounted for in this manner, but omitted, in the best tradition of the half-truth, is any reference to the power generating facilities, including two reservoirs, which were added later (with congressional approval) to meet the rapidly growing demands of the region.

Competing for a place in the rhetorical war, is the ridicule which is bestowed upon evaluation of reservoir evaporation losses. A single decade has wrought startling changes in our concept of science, but the roles of air temperature, humidity, and motion; and exposed area, still seem reasonably secure as the major factors to be considered in the determination of evaporation from any open body of water. Wind and weather conform to broad general patterns, and little is left, including the very minor amount by which this evaporation might increase the precipitation returning to the system, to introduce appreciable error.

As determined by academic methods, the evaporation losses from the best combination of substitute reservoirs exceeds by more than 300,000 acre-feet, the system minimum, which would be realized by the construction of the "stepchild" dams. This figure may not seem impressive to outsiders, but it has greater significance for the water-conscious region which was handed the bill by the Colorado River compact.

There is more to the problem than water storage, power generation, and cost, but this trio alone seems more than capable of promoting endless contention. With some "help" from Senator Watkins, Gen. U. S. Grant III publicly acknowledged one of the errors of his ways. The general is somewhat handi-

capped by his lack of knowledge of the Colorado River system, and his dependence upon reports which he had no hand in preparing. Costs which he found to his liking for his favorite projects, Bluff, New Moab, and Desolation, were taken from a report compiled in 1940, but for an Echo Park and Split Mountain comparison, he went to a 1949 report. Although both were plainly dated, the transition from a prewar to a postwar economy, where construction costs were more than doubled, was neglected in his figures.

Too little is known about these commonly, and, it seems, hastily chosen substitutes:

Bluff: A small project of relatively short life, unless protected by upstream reservoirs, on the silt-laden San Juan.

New Moab: The "Joker" of the trio, inundating, as it does, portions of the Arches National Monument. The waters of a reservoir of the size contemplated by General Grant would sever a large portion of the Monument including the famous Delicate Arch. If restricted in size to prevent monument encroachment, both storage capacity and power generation become negligible.

Desolation: Here a reservoir of 7 million acre-feet capacity, but little more than that required in combination with the foregoing as substitutes for Echo Park and Split Mountain, would have a surface area of 115,000 acres or about three times that of the Echo Park Reservoir. When other disadvantages of the Desolation site, higher temperature, lower humidity, and more wind, are considered, it becomes obvious that Reclamation's concern over evaporation loss is not idle conjecture.

To placate those who recognize the validity of reservoir evaporation comparisons, still another phase of the chameleonic attack is resorted to. It is claimed, in direct contradiction of the Bureau of Reclamation's records of river flow, that there is ample water available for upstream needs. Unexpected exposures of this fallacy, and substantiation of the Bureau's data, came with the disclosure, during the Mexican Treaty deliberations of 1945, of the Hoover Dam document.

To all appearances the Bureau of Reclamation confidently expects full vindication of its methodical procedures, and conclusions; but not being permitted to publicize its case, can only await congressional hearings. The opposition has received relatively profuse publicity, and paradoxically, little scrutiny of its discomfitures and nebulous counterproposals; and it seems may need even more generous treatment in each subsequent encounter with reality.

Senator WATKINS. Are there any questions?

If not, thank you very much, Mr. Untermann.

Mr. UNTERMANN. Thank you very much for allowing me to present my statement.

Senator WATKINS. The next witness will be Mr. Herbert F. Smart, attorney, from Salt Lake City, Utah, representing the Utah Chapter of the National Wildlife Federation.

STATEMENT OF HERBERT F. SMART, SECRETARY, WILDLIFE FEDERATION, SALT LAKE CITY, UTAH

Mr. SMART. Mr. Chairman and members of the committee, I am Herbert F. Smart, attorney at law, Salt Lake City, Utah. I am the present secretary of the Utah Wildlife Federation, a statewide organization of the State of Utah, having a membership of over 15,000 individuals there, and affiliates within the State of Utah of over 40 wildlife clubs.

I am a past president of this organization. I was its president during 1946 and 1947. For over 10 years I have acted as its legislative chairman and have drafted its legislation which has been presented both to Congress and to our own State legislature.

I mention this for the reason that I want you to know that in taking a stand in favor of the Echo Park Dam, which is in opposition to the conservation organizations, that I am not taking this stand as

one who has become a member of a conservation organization, or a conservationist since this controversy arose.

Inasmuch as the Salt Lake City Chamber of Commerce and the Utah State Manufacturers Association see eye to eye on this problem with the Utah Wildlife Federation, at this hearing I am representing those organizations also. It is my purpose here to answer from the conservation or wildlife point of view the opposition to this project.

May I say that our organization has gone on record by resolution as favoring this Echo Park Dam and the entire Colorado River project. We have done this not only because of what it means to the economics of our western land, but we have done it after analysis of the wildlife interests and the conditions under which the monument boundaries were extended in 1938.

The Echo Park Dam site is, as you know, located in a canyon area, and to follow out our objectives and our aims of having our lands used for preservation of its soil, waters, forests, plantlife, wildlife, and other renewable resources, we have concluded that the construction of the Echo Park Dam will not destroy or impair these resources, but will substantially increase these resources.

The canyon area, of course, by the impoundment of the dam, will not affect the soil. There are no forests in this area, so the impounded water cannot affect forests.

Senator ANDERSON. Are you reading from your statement?

Mr. SMART. I am trying to summarize and then I will ask that the entire statement be inserted, Senator Anderson.

We certainly include in our western philosophy of conservation, the conservation of water. To us the impoundment of water is as necessary as the rainfall on the Great Plains region. We have to have that impoundment. It is a part of our conservation principle.

There can be no question but what the construction of the Echo Park Dam will serve that object. As to the question of our fish in the Green and Yampa Rivers, as has been stated here, that water is full of silt. There are no game fish in that area that are worth mentioning.

For economic value, Mr. M. J. Madson, who is in charge of the fisheries for the State of Utah, has stated that at the present time its value would not exceed \$2,000 a year.

After the dam is built and the silt is caught at the dam, the waters below there will be clear, then it will be cool, and it will make an excellent trout stream.

We have not yet concluded as to what would be the effect of the impounded waters so far as producing trout in the lake. That is an unknown factor. But certainly to the extent that it does improve it, be it little or be it small, it will be an improvement because there are no game fish there now.

Game fish which have been caught and which have been displayed in some of the magazines which have been printed in opposition to this, are caught at what we call the Jones Creek. It is a small creek which runs into the Green River and which will not be affected by the Echo Park Dam and which will be affected only at its mouth so far as the Split Mountain Dam is concerned.

From the waterfowl point of view, the impounded waters will provide a resting place for waterfowl during migration periods. We expect that to be a major conservation contribution. They are at the present time a few goose nesting areas on a part of that. The dam

will, of course, destroy those, but we anticipate they will move a little further up the river.

In turn, we will get the migration into that area during their migratory flight. Our big game herds, our deer in that area will not be affected since this area is neither a winter nor a summer range for deer. The canyon area is a place where the deer do not congregate. In the summer we find them up in the forests and in the winter we find them out on the flatlands to take care of themselves during the heavy winter periods.

So we find that there will be no adverse effect so far as our big game are concerned.

What other resources are there? Scenery? Yes, that area is scenic. But we have that type of scenery all through our southwestern area. To attempt to preserve one scenic spot in a desert wonderland of similar scenery, of hundreds of thousands of acres, and hundreds and thousands of miles, is like saying "You can't have bread but every one else can have cake because there is plenty of it."

As has been stated here, in analyzing what will be the effect of the dam on the scenery, it is true that in the lower portions of the canyon it will be covered but as has been stated, the clear water, the placid water, will permit a waterway to see the rest of it.

This will be particularly true in the Lodore Canyon which is visited by very, very few people at the present time because of the character and the danger of running that stream.

We think that as a recreation area the construction of the dam will improve it and it will be a conservation gain.

So from a point of view of wildlife, we see no reason to object to the construction of this dam. We see nothing in those renewable resources which can be hurt, and we certainly see where they can find substantial gains.

The second basis upon which our organization favors this project, and does not oppose it, is because of the reservations and the promises which were made to the people of that area at the time the boundaries were enlarged in 1938. Those have been amply covered by Senator Stringham in his statement.

In the interest of time, I shall not repeat mine. I want to make this point, however, that we out there take this position: If, when a monument area is created or enlarged, and assurances and promises are made to the people that if necessary the area shall be used for a particular purpose, in this case water and power, if we can not expect the Government to keep those assurances, on what basis can we then contend that the Government should keep its promises for the inviolability of a national park or national monument which did not have any reservations. To us, the question is one of the integrity of Government, solely and simply. And we think there is this concomitant principle involved: That in order to protect and safeguard the inviolability of a monument or park in which there were no reservations, we certainly must protect those in which there were reservations and respect and honor those very promises and assurances.

The question of Echo Park considered on its individual merits has been taken up in some of our western organizations and States, particularly since the first of the year when this bitter controversy and opposition arose. On May 5, at Las Vegas, the Western Association

of State Game and Fish Commissioners passed a resolution which I presume has been sent to this committee, since it has the provision that it should be sent to the appropriate congressional committee, in which that organization, by resolution, went on record as favoring the construction and development of the upper Colorado project, and particularly the Echo Park Dam, stating that it is in the interest of conservation. I wonder, and I submit, that those who are charged by law with the administration of our wildlife resources, they are the best ones to determine what is in the interest of those wildlife resources, and this organization is composed of those who are charged by law in our Western States with administering these very resources that other conservation groups say are going to be hurt.

Of more recent date the New Mexico Game Protective Association has passed a resolution favoring this project, including the Echo Park Dam, and as you were pointing out this morning, Senator Anderson, also for the New Mexico projects which you were interested in.

Senator ANDERSON. Is Hugh Woodward a member of that organization?

Mr. SMART. Hugh Woodward is a former president. He is a member of the organization, and he is at present associated with the National Wildlife Federation, as I am.

Senator ANDERSON. Do you not regard him as a very strong friend of conservation? I assure you I do.

Mr. SMART. I regard Hugh Woodward as one of the outstanding leaders in conservation.

I might say, Senator Anderson, in connection with the consideration of Senate bill 2548, the Aiken bill, that it was Woodward and I who suggested the recommendations which were largely responsible for the amendments that were made by the Senate in the passage of that bill. I regard Mr. Woodward as one of the outstanding and practical conservationists of our day.

Senator ANDERSON. I appreciate that statement. Most of the people in New Mexico so regard him. I am very happy to have that endorsement from you.

Mr. SMART. I am sure they do.

May I also state that more recently, on June 24, the Wyoming Federated Sportsmen Association also passed its resolution endorsing the upper Colorado River project and the Echo Park Dam. So we find that on this question of the conservationists and the Echo Park Dam controversy, there is a pro and a con in our own organization.

We believe that Government integrity requires the keeping of those promises and assurances which have been made. We believe that the constructionists will aid and promote our wildlife resources, and we think the values that will come will result not only to us who live there but to all those in the United States who desire to partake and participate in these western outdoor activities, and that certainly the construction of Echo Park Dam will merely be more for all.

Thank you very much.

Senator ANDERSON. Mr. Chairman, can the resolution of the Utah Wildlife Federation be printed in the record following the testimony of this witness?

Senator WATKINS. Yes; it may be printed. And the entire statement which Mr. Smart submitted may be made a part of the record.

Mr. SMART. Thank you.

Senator ANDERSON. Do you say you have available the resolution from the New Mexico association and the Wyoming association on this subject to place into the record?

Mr. SMART. I think one of the Wyoming men who is here has the resolution from them. I have not seen it. My information on New Mexico was taken from their journal, which I receive monthly, and I don't have the wording on it. I have a copy of the resolution adopted by the Western Association of State Game and Fish Commissioners.

Senator ANDERSON. May that be incorporated in the record at this point?

Senator WATKINS. It may be.

(Resolution of the Western Association of State Game and Fish Commissioners follows:)

RESOLUTION NO. 1—DEVELOPMENT OF UPPER COLORADO RIVER STORAGE PROJECT

Whereas President Franklin D. Roosevelt, in his proclamation enlarging the Dinosaur National Monument, published in the Federal Register of July 20, 1938, specifically stipulated that "the administration of the monument shall be subject to the reclamation withdrawal of October 17, 1904, * * * in connection with the Green River project," and

Whereas the postproject wildlife and recreational values of the upper Colorado project is imperative to the progress and economic prosperity of the upper basin States, and

Whereas the postproject wildlife and recreational values of the upper Colorado River project will be far greater than the undeveloped river now possesses: Now, therefore, be it

Resolved, That the Western Association of State Game and Fish Commissioners go on record as approving the report of the Secretary of the Interior, recommending the development of the upper Colorado River storage project, including the construction of Echo Park Dam; and be it further

Resolved, That a copy of this resolution be sent to the Budget Director and to the appropriate congressional committee.

Senator KUCHEL. Mr. Smart, first of all I want to say sitting here at the sufferance and by permission of the chairman of the subcommittee, I listened to your statement and I think it was very fair and very courteous. I think it is the type of statement, on this whole basis of scenic development and improvement and maintenance, which can be utilized by the committee. Is it not true that there are quite a number of similar organizations devoting themselves to scenic beauty in the Nation that have reached a conclusion quite opposite from the one you have suggested today?

Mr. SMART. Definitely, that is true.

Senator KUCHEL. And those organizations and the beliefs they have ought likewise to be presented to the committee, should they not, for consideration on the points which you have made?

Mr. SMART. Why, certainly.

Senator KUCHEL. I take it, Mr. Chairman, that as the hearings develop, either representatives or organizations which do oppose the bill before you will be heard and that their resolutions likewise may be placed in the record?

Senator WATKINS. We have about a day and a half devoted to them.

Mr. SMART. May I make one further comment? This is the comment: To those of us who have been in that southwestern country, we

have seen so much of these deep channel canyons, and so many of these precipitous monoliths, that we do not consider one as the only one that is there. We put it in its perspective of having many and not merely having one.

(Mr. Smart's statement follows:)

STATEMENT OF HERBERT F. SMART, SALT LAKE CITY, UTAH

My name is Herbert F. Smart, attorney at law, Salt Lake City, Utah, and secretary of the Utah Wildlife Federation, a Statewide conservation organization of the State of Utah. Our federation is composed of 40 local clubs with a membership of over 15,000. Our organization is an affiliate of the National Wildlife Federation. I am a former assistant attorney general of the State of Utah and a past president of the Utah Wildlife Federation.

This statement is made in support of the Colorado River development project as submitted to the Congress by the Department of Interior, and my statement relates particularly to the endorsement and support of the immediate construction of Echo Park Dam as a part of such project and the development of recreational and wildlife resources as contemplated by the Department of Interior's recommendations.

In making this statement, I am aware that the National Wildlife Federation, as well as other conservation organizations, has gone on record as opposed to the construction of the Echo Park Dam. The Utah Wildlife Federation believes that such opposition is not in the best interest of conservation, recreation, and wildlife. By resolution unanimously passed at the annual meeting of the Utah Wildlife Federation on January 17, 1954, we strongly urge the immediate construction of the Echo Park Dam. A copy of this resolution is attached and is made a part of this statement by reference.

In order to properly evaluate the opposition by conservation organizations to the Echo Park Dam one must first understand the reasons behind such opposition. Ever since the construction of high dams, particularly in the Western States, the plans for such construction, and the actual building of the dams have gone forward without adequate consideration and evaluation being given to the destruction of wildlife resources. In order to meet this ever increasing challenge, aroused conservation interests, of which the Utah Wildlife Federation is a part, have felt it necessary to oppose high dams when such dams do not give proper consideration and safeguard wildlife and other conservation resources. In addition thereto, it is the feeling of conservation groups that national parks and monuments set aside for the recreational, cultural, and esthetic needs of the people should not be invaded by artificial structures which could cover or destroy these needs.

With these general principles, the Utah Wildlife Federation is in accord.

Thus, the conservation opposition to Echo Park Dam was based upon the general principles heretofore enunciated and until recently, no attempt was made on a regional or national basis to determine whether Echo Park Dam was an exception to the stated general principles.

The Utah federation has always recognized that because of promises and conditions made incident to the extension of the boundaries of the Dinosaur National Monument in 1938, the added area was not within the general principles above stated. The Echo Park Dam site is an exception to these principles. This exception is predicated upon two premises, first, there will be no destruction of wildlife resources by the building of Echo Park Dam, and secondly, the boundaries were extended subject to the use of the area for water impoundment purposes.

Conservation, as I understand it, means the preservation and wise use of soil, waters, forests, plant life, wildlife, and other renewable resources. None of these resources will the construction of Echo Park Dam destroy or impair.

It will have no adverse effect upon the soil since the impounded water is in a canyon area. It will have no effect upon a forest since there is none there. The impounding of water at the Echo Park Dam site will mean less loss of water by evaporation. If I recall correctly, even the data submitted by Gen. U. S. Grant III, in his testimony before the House Irrigation Subcommittee in January 1954, conceded that as a water vessel Echo Park would permit less loss of water by evaporation. We in the arid West certainly include the storage of water for our many needs as affirmative conservation.

No plant life of value would be destroyed by the impounded water. What wildlife would be destroyed? The waters of the Green and Yampa at this location are typical muddy water found along the Colorado. No game fish worth mentioning are there. The game fish which some uninformed individuals believe are there, are actually caught at Jones Hole, a small stream running into the Green River and which would not be affected by the construction of this dam or the Split Mountain Dam. After the dam is built the waters below the dam will be clear and will make an extremely good trout stream. The impounded waters offer the probability of becoming a lake with plentiful game fish. M. J. Madson, the fisheries biologist for the State of Utah, says the present value of that portion of the river which will be affected by the Echo Park Dam is not at the present time in excess of \$2,000 per year. He further states that the construction of Echo Park Dam will materially improve our fishing resources in that area.

We envision our waterfowl resources will be improved since the impounded water will provide a resting place during migrations. At the present time, there are a few goose nesting areas there. Some of these will be inundated by the water but we believe that the additional water will attract many more waterfowl.

Our deer herds will not be affected since this area is neither a winter or a summer range for our deer or our elk. From a wildlife standpoint the construction of Echo Park Dam will mean only a material conservation gain.

What other resources are involved? Scenery—yes, the area is scenic, but similar scenery, much of it more awe inspiring, exists further down the Green River along the Colorado, along the San Juan, and in other western areas. Even though some of these canyon walls will be partially inundated, this small loss is more than offset by the fact that the remaining beauty will be accessible to thousands. The

waterway provided by the dam will permit thousands to see this attraction who cannot and would not see it in its present state because of the hardship and danger encountered in a boat trip down the river. Beauties of this nature may be seen further down the Green River, along the Colorado River, along the San Juan River, and other areas including the Grand Canyon of the Yellowstone. Thus, even if the entire scenery of the Green and Yampa were to be destroyed by the dam, it would not be an irreplaceable loss since our western land abounds with deep chasms and magnificent monoliths exceeding in beauty the much propagandized Steamboat Rock. Illustrative of this is Zion's National Park with its incomparable Great White Throne.

With the project plans for recreation and boating in this area, we believe the Dinosaur National Monument will emerge as a prime recreation and beauty area far exceeding its now lowly status.

Secondly, the conservation opposition is predicated upon the invasion of the national monuments or parks by reclamation projects and the premise that the construction of the dam would violate the basic fundamental of preserving the national park system. As applied to the extended boundaries of the Dinosaur National Monument, this premise is false.

I make this statement advisedly since we in Utah are particularly conscious of the esthetic, moral, and spiritual values of national parks and monuments. Utah has many national parks and monuments. We are and have been national park and monument conscious. This was particularly illustrated when the boundaries of Dinosaur National Monument were extended, since it was Utah people, among others, who desired it.

Factually, the boundaries of Dinosaur Monument were extended subject to the reservation and condition that if the area were needed for reclamation and power purposes, the extension would not jeopardize such projects.

As early as 1932, the Echo Park site was selected as a power site by the Utah Power & Light Co. and its value as a storage vessel was recognized by our people before the boundaries were extended.

In 1937, Mr. Harold G. Miller, sports editor of the Deseret News daily paper, accompanied by Dr. J. E. Broadus, archeologist, Charles Kelly, Dr. Russell G. Frazier, and others, made the Yampa and Green River Boat trip. They, as well as others, went to bat to have the monument boundaries extended. In a letter addressed to me dated March 1, 1954, Mr. Miller makes this statement:

It doesn't make sense that so few of us could have got the thing into a national monument and thereby put aside land which is so valuable now to the needs of the people, and it was done with the understanding that when the area was needed for water storage and development, it would be taken.

At the time of the enlargement of the Dinosaur National Monument from its original 88 acres to its present site of 209,000 acres, public meetings were held in Utah and Colorado at which Mr. David H. Madsen, then acting director of Dinosaur National Monument, stated he was authorized by the National Park Service to state the proposed enlargement of the boundaries would be subject to the impoundment of the waters in the course of the upper Colorado River project and that grazing privileges would be continued. This understanding was

given to the people of the West and was relied upon by them. President Franklin D. Roosevelt's proclamation enlarging the monument area recognized this understanding. If it be contended as some have attempted to say, that the proclamation means the designation of one particular site, we reply that that was not the intent nor the promises.

In a release carrying the Washington dateline by Harry J. Brown, there appeared in the Salt Lake Tribune of July 29, 1938, a news article of the extension of the Dinosaur Monument boundaries. Included in the release was the following statement:

Under the order enlarging the monument, grazing will continue in areas which previously had been used by stockmen and power and irrigation rights will be recognized.

The promises and assurances were recognized by Director of the National Park Service, Newton B. Drury, in a letter to Dr. J. E. Broaddus under date of May 2, 1946, in which Mr. Drury stated:

I appreciate your courtesy in writing me as you did about your continued interest in preserving the park and monument areas in Utah, and giving me an evaluation of the scenic qualities of the canyon country within Dinosaur National Monument. Through my long association with conservation organizations, including this Service, I am well acquainted with your work and with the contribution you have made toward bringing the outstanding scenic areas of Utah to the public attention which led to their protection and preservation.

I am intensely interested in your statement about the possible beneficial effect of the proposed Echo Park Reservoir in Dinosaur National Monument as a means of access for visitors to see the Green and Yampa Canyons.

The extensive river basin surveys now being conducted by the several agencies of the Government are of concern to us, as some proposals may adversely affect areas of the national park system. Dinosaur is one of the few areas in the system established subject to a reclamation withdrawal and this may have some bearing on the proposed Echo Park project.

Secretary of Interior Oscar S. Chapman, in his order of June 27, 1950, authorizing this project, stated "(b) the order establishing the extension of the monument in the canyons in which the dams would be placed contemplated use of the monument for a water project and my action, therefore, will not provide a precedent dangerous to other reserved areas."

After the enlargement of the monument, the Bureau of Reclamation made topographical studies, drilled dam sites, took stream measurements and designed the structures, all with the knowledge and consent of the National Park Service and without protests from present opponents. This action was taken in reliance upon the reservation that the site would be available for dams. This action is an administrative recognition that the area was set aside subject to reclamation projects.

An evaluation of the historical conditions under which the boundaries were extended establishes without doubt that the question is not one of preserving the inviolability of a national monument. The boundaries were enlarged with the reservation as a condition precedent to its enlargement. If there is a principle involved in this controversy, that principle is the integrity of government in keeping promises and assurances made to a people at the time a national monument is created or enlarged.

As I stated before, it was only in the last 3 months that the distinguishing features of the Dinosaur National Monument were called to the attention of some of the conservation interests that have been opposing this project. At the National Wildlife Federation Conven-

tion held in Chicago on March 11, 12, and 13 of this year I was given the opportunity of presenting the Utah federation's position with respect to this project. As a result, the national federation board of directors appointed a special committee to make a further investigation of this particular dam site with recommendations to be made later to the federation.

Until our position had been stated, few, if any, of the representatives and officers knew of the distinguishing features which I have pointed out above.

On May 5, 1954, the Western Association of State Game and Fish Commissioners at their convention in Las Vegas passed a resolution favoring the construction of the Echo Park Dam and the development of the upper Colorado River storage project. This resolution recognized the distinguishing feature that I have pointed out.

The western association is composed of State conservation directors and commissioners of the 11 Western States, and it is interesting to note that there was no opposing vote to this resolution, it having even the support of that noted conservationist from California, Mr. Seth Gordon.

We know the construction of Echo Park Dam will be a positive conservation gain.

Aside from the economical gain which will come to the upper-basin States and the United States from the construction of this project, our recreational and scenic values and our fish and wildlife values will be greatly enhanced, not only for the pleasure and esthetic values of ourselves but for all of the people of the United States who love the great outdoors and desire to participate in those beauties which are typically western.

UTAH WILDLIFE FEDERATION RESOLUTION NO. 1—FAVORING CONSTRUCTION OF ECHO PARK DAM

Whereas the development of the upper Colorado River Basin project is one of the major conservation projects in the United States; and

Whereas the construction of the Echo Park Dam is an integral and necessary part of the entire project; and

Whereas the construction of Echo Park Dam will not adversely affect any part of the Dinosaur National Monument as originally constituted; and

Whereas the enlargement of the Dinosaur National Monument in 1938 was made expressly subject to the development of the upper Colorado River Basin; and

Whereas the construction of Echo Park Dam will make water available for irrigation, which in turn will improve wildlife habitat; and

Whereas the Echo Park Reservoir will provide abundant water for fish and aquatic wildlife; and

Whereas we believe the gain to wildlife and recreation will greatly outweigh any initial loss of wildlife habitat; and

Whereas the construction of the Echo Park Dam will make the beauty of this area available to millions who otherwise would never see it; and

Whereas because the enlargement of Dinosaur National Monument in 1938 was made expressly subject to the upper Colorado River Basin project, the construction of Echo Park Dam will not establish a precedent for the destruction of other national monuments and parks; and

Whereas the conservation of water and water resources is a crying need in all Western States and the United States; and

Whereas certain conservation groups, including the National Wildlife Federation and the Wildlife Management Institute, are opposing the construction of Echo Park Dam; and

Whereas we believe such conservation organizations do not have, or refuse to see, the facts relative to the Echo Park Dam; and

Whereas we believe the attitude of such conservation organizations is based upon fear that other national monuments and parks may be destroyed; and

Whereas we believe such fear is unwarranted and ill-advised, and that opposition to Echo Park Reservoir is not conservation, not in the interest of conservation, nor in the interest of the people of the West, nor in the interest of the people of the United States; and

Whereas conservation groups, by press releases from Washington, D. C., have created and left in the minds of the public that we are opposed to Echo Dam; and Whereas in January 1950, we by resolution favored Echo Dam; and

Whereas we desire to correct any misunderstanding, created innocently or otherwise, regarding our considered stand on the construction of Echo Dam: Now, therefore, be it

Resolved by the Utah Wildlife Federation in convention assembled this 17th day of January 1954:

First, the Utah Wildlife Federation endorses and supports the upper Colorado River Basin project and the construction of Echo Park Dam as an integral and necessary part thereof as being in the best interest of conservation, recreation, wildlife, and of the people of the West, and of the people of the United States.

Second, this resolution to be telegraphed to Representative William A. Dawson, House Office Building, Washington, D. C., for presentation to the committee holding hearings on Echo Park Dam, January 18, 1954; and copies to be mailed immediately to the congressional delegation from Utah, to the President of the United States, to the Speaker of the National House of Representatives to the President of the United States Senate, to the National Wildlife Federation, and to the Wildlife Management Institute.

This resolution unanimously adopted by the Utah Wildlife Federation in convention assembled this 17th day of January 1954.

DR. D. KEITH BARNES, *President.*

Senator WATKINS. I call the Honorable John R. Erickson, commissioner for New Mexico for the Colorado River Commission, and State engineer for the State of New Mexico.

STATEMENT OF JOHN R. ERICKSON, STATE ENGINEER, AND NEW MEXICO COMMISSIONER ON THE UPPER COLORADO RIVER COMMISSION

Mr. ERICKSON. My name is John R. Erickson. I am the New Mexico member of the Upper Colorado River Commission, at the present time vice chairman of that commission, and I am the State engineer of New Mexico. My home and office are in Santa Fe, the capital of the State. I have had nearly 20 years of specialized experience as an engineer in the field of water, much of which has been related to the problems of the Colorado River Basin.

This statement is made on behalf of the State of New Mexico.

I would like to say that for the sake of brevity I have confined my statement to the New Mexico problem, and that fact does not detract from our strong conviction that the Colorado River project is one project, a unit to be developed as a basin plan.

Senator ANDERSON (presiding). In order that there could be no misunderstanding of New Mexico's point of view, New Mexico strongly supports these projects in various other States. New Mexico believes in the development of the entire basin plan; does it not?

Mr. ERICKSON. That is correct.

Senator ANDERSON. And New Mexico is in support of the position taken by the Upper Colorado River Commission itself; is it not?

Mr. ERICKSON. Yes, sir.

We strongly support the authorization of the Colorado River storage project and its participating projects, substantially as now before you in S. 1555.

New Mexico's need: New Mexico must put to use every drop of water available to it if it is to sustain its present dynamic growth and development.

Our State is one of the very arid ones of the Union. Only the States of Nevada, Arizona, and Utah have less average annual precipitation. Our mountainous water-producing areas are limited in extent and the productive lands lying along the valley areas receive only about 6 to 12 inches of precipitation annually. A considerable portion of our available water supply flows down from the mountains of Colorado. The use of these waters is governed by interstate compacts.

Although the State is fourth largest in size, covering about 77,700,000 acres, its limited water resources have permitted the irrigation of less than 1 percent of the total land area. Of the 691,000 acres irrigated in 1950, about 431,000 were served by surface waters, the remaining 260,000 being supplied from underground water sources. Almost two-thirds of the groundwater development has been made since the close of World War II. This development has been a great aid in sustaining an expanding economy. The ground water resources are a limited and largely nonrenewable resource. Many of the groundwater basins of the high plains area will be literally mined the same as a mineral resource such as oil, gas, or coal.

We must look to our renewable surface water supplies to sustain our civilization. Drought and economic conditions have played on our surface water development to the extent that there has been a total net decline of 10 percent in the irrigated acreage served by surface waters since 1920. This has come about in spite of the recent development of approximately 40,000 acres of new land by the Tucumcari project and a substantial gain in acreage under the Rio Grande project.

Except for the San Juan River, surface waters of the State have been almost completely appropriated within the State's allocations under its various interstate compacts and court decrees.

Superimposed on this limited water situation has been the demand for additional uses by a growing population. Between 1940 and 1950 the population of the State has expanded by 28 percent. Since 1950 the growth has increased at an even faster rate. The future outlook is serious even if the State is able to utilize and conserve its remaining water resources at an early date.

In addition to the general situation, and of vital importance to the State and to the Nation, is the urgent need of the Navaho people for water for irrigation and domestic supplies. The chairman of the Navaho Tribal Council, Mr. Sam Ahkeah, is here and will explain their problems to the committee.

Some new irrigation development is possible through conservation and better use of the available supplies, but this source is definitely limited. The only significant unused water supply remaining in New Mexico is that in the San Juan River and its tributaries. Authorization of the Colorado River storage project and participating projects is essential if the State is to utilize its allocated waters.

Relief from the Colorado River: Two compacts, the Colorado River compact and the upper Colorado River compact have opened the way for New Mexico to utilize waters of the San Juan River, a tributary of the Colorado River. Our only significant source of supply from the Colorado River system is from the San Juan River Basin. Physi-

cal characteristics of the terrain in northwestern New Mexico are such that projects to bring this water to use will be extremely expensive. Unless these projects can be constructed, however, only a small portion of New Mexico's allocated supply from the Colorado River system can be put to use. For that reason we fully support the principles of the Colorado River storage project.

Projects included in S. 1555: In the original bill before this committee there were included for construction in New Mexico 1 storage unit and 3 participating projects.

Navaho Dam and reservoir was included among the initial units of the storage project together with Echo Park, Flaming Gorge, Glen Canyon, and Curecanti. It was contemplated that those reservoirs would operate as a coordinated river regulation and power system and that reservoirs such as Flaming Gorge and Navaho would carry their portion of the load until they were needed for other purposes as provided for by the upper Colorado River compact.

Among the participating projects, Hammond is a small irrigation project of about 3,700 acres lying along the San Juan in the vicinity of Bloomfield, N. Mex. It lies below the higher lands of the south San Juan division of the Navaho project. Serving lands on the benches above the Hammond and westward to the Shiprock monolith is the project designated in S. 1555 as the Shiprock-South San Juan Indian irrigation project. It has more recently been designated as the Navaho project by the Department of the Interior. It consists of two interrelated divisions, the Shiprock (Indian division) and the south San Juan division.

Upstream from the Navaho Dam in the tributary area of the San Juan Basin in Colorado and New Mexico the San Juan-Chama project would divert water from the San Juan Basin into the Chama River, a tributary of the Rio Grande, for use in the Rio Grande Basin.

This bill (S. 1555) as introduced would authorize the Navaho Dam and the Hammond project. Because feasibility reports have not been completed on either the San Juan-Chama or Navaho projects, but because of the very close interrelation of the water supplies of these projects, the bill would grant provisional authorization of those two projects. I will discuss that in more detail later in this statement.

I might say there is considerable information about these projects, but the information has not been brought together into what we could term feasibility reports at this time.

Senator ANDERSON. You are familiar with those reports to some degree, are you not? You know that the work could be quite quickly brought together if it were determined to do so?

Mr. ERICKSON. I feel that it could, Senator.

Senator ANDERSON. I am sure Mr. Larson was very frank and kind on that point and did say it could be done quite quickly after the material was brought together and the representative of the Indian Irrigation Service, Mr. Keesee, agreed on that also. I know you have been in close touch with the situation. I think it is your feeling, also, that these reports could be brought forward quite rapidly.

Mr. ERICKSON. Yes, sir. There has been a great deal of work done and money expended on investigations in New Mexico on these projects. I think if a very strenuous effort were made to bring it together, it could be done.

After development of the projects under consideration, there would still be some remaining water for use in the San Juan Basin of the State if feasible projects could be found. Except for relatively small conservation facilities, rehabilitation of existing works and better use of available supplies throughout New Mexico, completion of San Juan projects will virtually bring the development of surface waters in New Mexico to an end.

Events influencing New Mexico's present position: Under date of December 15, 1950, region 4 of the Bureau of Reclamation submitted a report to the Commissioner on the Colorado River storage project and participating projects, upper Colorado River Basin. Among the recommendations in that report was the following:

(d) That, pursuant to the recommendations of the Commissioner of Indian Affairs, and in order to consolidate the recommendations of the Secretary for dependent projects in the upper Colorado River Basin, the Shiprock Indian project be authorized for construction, operation, and maintenance in accordance with applicable laws to the development of irrigation projects on Indian reservations including the provisions of the act of July 1, 1932 (42 Stat. 564, 25 U. S. C. 386A) provided, however, that this project shall receive assistance from the upper Colorado River account in the same manner and in the same degree as other participating projects.

That recommendation was accepted by the Secretary of the Interior and has been retained by him in all subsequent actions. New Mexico has consistently fought for sufficient water to supply a Shiprock project and will bend every effort toward obtaining authorization for such project to serve the Navaho people. It became deeply concerned, however, over the open-ended nature of the recommendation and the authorization sought by the Secretary.

This concern grew out of the fact that if these projects are constructed to anywhere near the size contemplated, they will require for diversion virtually every drop of the water from that source. Feasibility of these competing projects depends to a large extent on the amount of water available for diversion. In other words, a balance must be determined so that, if possible, the water demand of one project will not destroy the feasibility of the other.

New Mexico, therefore, has insisted upon simultaneous consideration of the three units. (See attached letter from Gov. Edwin L. Mechem to Secretary Douglas McKay.)

Senator ANDERSON. This morning I was discussing a letter from the Secretary of the Interior to the Commissioner for the Bureau of Indian Affairs and the Assistant Commissioner for the Bureau of Reclamation on the investigation of projects using San Juan River water. That statement which I believe I will ask to have incorporated at this point said:

Attached for your information and use are copies of letters of March 4 and March 17 from the Governor of the State of New Mexico.

Then further it said these two agencies, the Indian Irrigation Service and the Bureau of Reclamation, were to undertake and complete as soon as practical the investigations and feasibility reports on the South San Juan-Shiprock project and the San Juan-Chama diversion project.

Then further:

The investigations and the report thereon should be based on the criteria, particularly that relating to annual diversion requirements, set forth in the Governor's letter.

Do I understand this to be the letter of March 4 which you have just now presented for the record?

(The letter referred to is as follows):

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington 25, D. C., May 20, 1953.

MEMORANDUM

To: Commissioner, Bureau of Indian Affairs, Assistant Commissioner Line-weaver, Bureau of Reclamation.

From: Secretary of the Interior.

Subject: Investigations of projects using San Juan River water, New Mexico.

Attached for your information and use are copies of letters of March 4 and 17 from the Governor of the State of New Mexico. Also attached is a copy of my reply to those letters, as well as my reply to the letter of February 6 from Mr. Sam Ahkeah, chairman, Navaho Tribal Council.

Within your budgetary limits, I am asking each of you to see that the respective agencies undertake and complete, as soon as practicable, the investigations and completion of feasibility reports on the South San Juan-Shiprock project and the San Juan-Chama diversion project.

The investigations and the report thereon should be based on the criteria, particularly that relating to annual diversion requirements, set forth the Governor's letter. Arrangements should be made, probably at your field level, to use similar economic and cost data in both investigations to assure comparability of the work.

The Bureau of Indian Affairs will be responsible for the investigations and obtaining of data covering the Shiprock portion of the combined South San Juan-Shiprock project, and will be responsible for preparation of the feasibility report. The Bureau of Reclamation will be responsible for the investigations and obtaining of data covering the south San Juan portion of the combined project.

Each agency should take particular care to assure that proper officials of the State of New Mexico are given every opportunity to participate in the investigations.

DOUGLAS MCKAY,
Secretary of the Interior.

Mr. ERICKSON. Yes, sir; that is the same letter.

Senator ANDERSON. What are the annual diversion requirements as set forth in that letter, approximately?

Mr. ERICKSON. Senator, may I explain by way of suggestion that we had developed a range within which the project might be constructed. The suggestion for consideration and study was that there would be diversion to the Navaho project, which included the South San Juan unit of 630,000 acre-feet of water per annum as an ideal demand to the project and that that would leave approximately 235,000 to be used as a basis for study for transmountain diversion.

Senator ANDERSON. Those are the figures to which Mr. McKay is referring in this letter of May 20, 1953?

Mr. ERICKSON. Yes, sir.

Physically, this is essentially a single program consisting of 2 projects and 3 units. The two units of the Navaho project are indivisible parts of the same project. The location of the South San Juan unit which is separated from the rest of the project only by the Navaho Reservation line will influence the amount of acreage and the type of land that can be irrigated within the Shiprock division, which is that portion of the project lying within the Navaho Reservation.

San Juan-Chama project facilities would lie upriver from Navaho Dam, the diversion point of the Navaho project. Collection and diver-

sion works are largely in Colorado, and the control and distribution works within New Mexico, chiefly in the Chama River Basin.

Until feasibility reports became available for these projects, their exact sizes, water requirements, and benefit-cost ratios cannot be accurately determined. Preliminary work by a coordinating committee of Department of the Interior agencies indicated the approximate limits as to size of projects, and from the data available indicated that the projects would probably be feasible.

If these are all authorized, there will have to be definite operating agreements and a plan of control settled upon to assure a proper distribution of water between the east and west slopes. Until those features can be developed, New Mexico must insist upon uniform consideration of the various units of this program.

Objections to San Juan-Chama project: During the hearings before the Irrigation Subcommittee of the House Committee on Interior and Insular Affairs, regarding Colorado River storage project authorization bills in January of this year, several witnesses appeared for the State of Texas and for irrigation interests in New Mexico below the Elephant Butte Dam. They have objected to the construction of a San Juan-Chama project.

It appears from the record that they are not objecting to the importation of water to the Rio Grande Basin, but to the possible impounding and control of Chama River water, incidental to the power production which was outlined in an interim report on the project.

Unless there are definite operating plans and satisfactory control by an agency empowered to regulate the waters of the streams so as to fully protect their rights and interests, they have a legitimate complaint. The affected parties should and will have every opportunity to review the plans for these projects and New Mexico stands ready to cooperate with the affected parties in adjusting differences which may arise.

Opposition by the State of Texas and the irrigation districts under the Rio Grande project to the San Juan-Chama project does not alter New Mexico's position that the projects to be developed through the use of the waters of the San Juan River and its tributaries above Navaho Dam site must be considered as a single program from the standpoint of water supply and engineering and economic feasibility.

New Mexico is now urging the investigation of a plan to divert water through the San Juan-Chama project without including the power features which would control and regulate Chama water along with the imported San Juan water. This plan is possible by the construction of collection works as originally contemplated but with a single regulating reservoir in the Chama Basin off the main stream where little or no Chama water would be involved.

Preliminary indications are that such a project would have as favorable a benefit-cost ratio as a project including power, the difference in the two plans being the method of repayment. The original plan contemplated complete reimbursement of the project through returns from supplemental water, municipal water, and power generation on the Chama. This new plan would rely on the Colorado River Basin account to aid in the complete repayment of the project.

Reports and authorization: New Mexico urges the completion of feasibility reports on these projects. They are now in course of

preparation. When they are available, they will be subject to complete review by the affected parties and the plans subject to review and negotiation if necessary. Until those reports are available and approved by the interested parties and by Congress, it is not possible that construction could begin on the projects.

Because of the necessity of developing a unified program, it has been necessary to seek provisional authorization of the other projects along with the Shiprock division of the Navaho project recommended by the Secretary. It is recognized that the provisional authorization means nothing more than recognition of the program as a whole until the feasibility reports have been completely dealt with and approval has been given for the projects by the Congress.

Navaho Reservoir is an essential feature of the New Mexico program. Without it there can be no program of utilization of San Juan water by the State.

However, it also can be a valuable unit of the storage plan. Until such time as it can be put to use for the Navaho project (and it could well be a considerable length of time before it could be fully utilized for that purpose), Navaho Reservoir can contribute to regulation and sediment control, particularly in relation to the efficient operation and life of Glen Canyon Reservoir.

Because of Navaho's relative importance to New Mexico and to the plan as a whole, we strongly urge that this committee and the Congress consider the necessity of including Navaho Dam as an initial unit of the Colorado River storage project, to be constructed concurrently with Glen Canyon and other essential units of the plan.

Senator ANDERSON. We discussed that this morning, and there was some reassuring comment from members of the committee that that might be done. You regard it as essential, regardless of what finally happens to the water, that this dam be constructed and be authorized now?

Mr. ERICKSON. Yes, sir.

Senator WATKINS (presiding). I would like to say as one of the sponsors of the bill which is under consideration by the committee that I have not changed my mind at all. I think the Navaho project ought to be in there, and I never took any other position. I told you that I thought there was not much doubt that would be the final action of the committee.

Senator ANDERSON. I want to say that the chairman, who is certainly a true friend of reclamation, did make that statement to me, but I did not feel qualified to state that to the public until he himself said it. I am glad to have the assurance of the chairman that he feels as we do; that the Navaho Dam ought to be included as an initial project. I think Senator Millikin expressed himself similarly this morning.

I was glad to have your confirming statement, Mr. Erickson, that regardless of what is done with the water finally, that surely the Navaho Dam and Reservoir should be completed in the initial stage of this.

It is your feeling, then, that regardless of what we decide to do with the water once it is impounded by the Navaho Dam, the construction of the dam should start as early as possible?

Mr. ERICKSON. Yes, sir.

Senator ANDERSON. Because it will aid in the regulation of the river and control the silt. By the time it is finished, unquestionably we will have decided what to do with the water?

Mr. ERICKSON. That is right. There is some power potential there included as a unit with the other producing plants.

Senator ANDERSON. Now the question has also arisen that there might be a transmountain diversion. As I understand it—and I am going to ask you an engineering question—even if there was a desire or decision on the part of the people on the east slope to have a diversion over the mountains and use some of that water in the Rio Grande Valley, would it not be true that we would want the dam built to regulate streamflow so we would not be taking out all the water in the upper areas and leaving the people down below without water?

Mr. ERICKSON. That is true.

Senator ANDERSON. No matter which way they go with reference to the New Mexico project, whether it is wholly a Navaho-Shiprock project or whether the South San Juan is added, or whether there is even a diversion added, the Navaho Dam is essential?

Mr. ERICKSON. That is right.

Senator WATKINS. What is the main objection to the San Juan-Chama project on the part of Texas?

Mr. ERICKSON. As near as I could determine from the testimony that was given in the House hearings, Senator, it went to the point of the regulation of the Chama water incidental to the regulation of the San Juan water when it was taken into the Chama Basin. They felt that the Chama water would be withheld at the same time that the San Juan water was stored and that that water should go down to the Elephant Butte Reservoir as it has in the past.

Senator WATKINS. There wasn't any appropriation of the water on the stream in which the water brought from the San Juan would be commingled?

Mr. ERICKSON. Any attempt?

Senator WATKINS. I say there would not be any appropriation of the water on the Chama—

Mr. ERICKSON. No, sir; but they did fear that incidental to the storage of San Juan water that might be done.

Senator ANDERSON. In the early plan of the San Juan-Chama diversion there were 4 dams that might be constructed so that the greatest possible utilization could be made of water power. Those 4 dams would impound not only water from the San Juan River but would involve also water from the Chama River. They felt they had rights to the water in the Chama River and therefore had some questions about these power projects.

As the State engineer has indicated, we do not feel there was any controversy, but at the same time if it is possible to construct this without power features, that would probably make it possible for us to live in peace with our neighbors in Texas. That is the purpose of the study you are now making, is that correct?

Mr. ERICKSON. That is right.

Senator WATKINS. Have you talked this over with the Texas officials since the House hearings?

Senator ANDERSON. I think it is fair to say that the Governor of New Mexico did discuss this matter with Governor Shivers and others.

Mr. ERICKSON. That is correct. As to whether anything has been done since the House hearings, I am not clear, Senator Watkins. We did talk to the Texas officials about a different plan which would eliminate the objection, we thought, concerning the storage reservoirs on the Chama River. They refused to discuss the matter with us.

Senator WATKINS. The authorization of the Navaho could not possibly affect it unless there were an authorization to complete this transmountain diversion?

Mr. ERICKSON. That is right.

Senator WATKINS. That is not proposed at this time?

Mr. ERICKSON. That is right.

Senator WATKINS. What New Mexico officials are asking for is that the construction of Navaho Dam be authorized at this time?

Mr. ERICKSON. Yes, sir.

Senator KUCHEL. What is not proposed, did you say?

Senator WATKINS. There is no proposal now to admit the transmountain diversion in this authorization?

Mr. ERICKSON. Only as a provisional authorization to see the plan is worked out as a single program.

Senator WATKINS. There would not be any actual authorization now for construction?

Mr. ERICKSON. No, sir.

Senator ANDERSON. Is it not proper to say that the State desires to have feasibility reports on the Shiprock, on the South San Juan, and on the transmountain diversion, but the construction of any of these units would not be authorized until they have subsequently been submitted to the States again and approved by the Congress?

Mr. ERICKSON. That would be our understanding.

Senator WATKINS. Then the record will be clear on that.

Senator ANDERSON. But the construction of Navaho Dam would not in any way affect the rights of Texas or the controversy we may have with Texas or affect the question which the Senator from California had raised as to exchange water. The dam does not involve any exchange water. It does not involve anything but regulation of that water.

Mr. ERICKSON. That is right. It could not.

Senator ANDERSON. We ought to be able to build that without interfering with anybody.

Mr. ERICKSON. That is right.

Conclusion: Authorization of the Colorado River storage plan with its participating projects, and the recognition of the New Mexico units together with units to be constructed in other States, will constitute a great step forward in the conservation of this most valuable resource. Construction of reclamation projects at best is a slow process. There is evidence of immediate need in New Mexico and of coming need in the whole Colorado River Basin for this entire project. The future security of New Mexico, the West, and the Nation will be strengthened by this project.

We respectfully urge this committee to favorably consider our proposal, and we extend our thanks and appreciation for the privilege of appearing before this committee.

(The letter from Gov. Edwin L. Mechem to Secretary Douglas McKay, referred to earlier, follows:)

STATE OF NEW MEXICO,
Santa Fe, March 4, 1953.

HON. DOUGLAS MCKAY,
Secretary of the Interior,
Washington, D. C.

MY DEAR SECRETARY MCKAY: Flowing through the northwest corner of the State of New Mexico is the San Juan River, a principal tributary of the Colorado River. This stream is one of the last and by far the largest substantial water resource of the State yet to be developed.

New Mexico's rights in this river are defined by the terms of the Colorado River and upper Colorado River Basin compacts. The negotiation of the latter of these two compacts finally opened the way to proceed with the development of this vital resource.

During past years, four major projects and several minor ones have been contemplated to make use of the available supply, and a great deal of preliminary investigation has been done on these projects by agencies of your Department.

There are two main sources of water supply to be considered: (1) the main stem of the San Juan, rising in Colorado and entering New Mexico near the village of Rosa, N. Mex., and (2) the Animas River, also rising in Colorado in the vicinity of Silverton, flowing through Durango, Colo., and joining the San Juan River at the city of Farmington, N. Mex. Of immediate concern is the development of the main-stem supply.

Three of the four major projects will derive their water supply from the main stem of the San Juan, above the town of Blanco, N. Mex., and will compete directly with each other for the common supply. This physical situation has created a problem which has troubled the State of New Mexico for many years. It is, of course, further complicated by the knotty problem of transmountain versus inbasin uses.

Immediately upon ratification of the upper Colorado River compact, serious negotiations were started in an attempt to work out an agreeable solution. One of the most complicating factors was the dominant position of the Shiprock Indian project, and the as yet unknown status of the Indian rights. Midway in the progress of the negotiations, the Navaho Tribal Council asserted its active interest in the problem. Up to that point it had been assumed that the Navahos were fully represented by the Secretary through the Bureau of Indian Affairs. Although it may have resulted in some unlooked for delay, the active participation of the tribal council has been a stimulating influence upon the negotiations and has been welcomed by the State of New Mexico.

The selection of projects for further study became urgent when the Commissioner of Reclamation, upon the recommendation of the Commissioner of Indian Affairs, recommended to the Secretary that the Shiprock Indian project be included for authorization with other participating projects of the Colorado River storage project. Because of this recommendation, the State of New Mexico felt it was necessary to request similar authorization for both the south San Juan and San Juan-Chama projects, and ask that the authorization on all 3 be limited, and no appropriations made for their construction until they could be coordinated and feasibility reports prepared on all 3. The other States of the upper Colorado River Basin support New Mexico in this stand.

To date negotiations have failed to bring about complete agreement between all interested parties. Because of the possibility that legislation will be introduced during the present session of Congress, New Mexico has been obliged to make its own recommendation to you with respect to the feasibility studies it wishes to be made on these projects. This is consistent with the past policy of the Department of the Interior since it has been indicated through official channels on several occasions that the department expects the State to make the final selection of projects.

I, therefore, respectfully request that you direct the proper agencies of the Department of the Interior to study and make feasibility reports on projects in New Mexico utilizing San Juan River water as follows:

(1) A Shiprock project, which will include as a unit of such project the south San Juan project area. The better lands only should be considered for a subjugation within the initial development phases of the project. Any lands requiring special engineering consideration because of erosion or difficult drainage

problems should not be considered until the better lands of the project are fully developed.

The south San Juan unit should include both Indian and non-Indian lands and the Indian lands within the Navaho Reservation, which are of good quality and have good drainage, should be served in lieu of poorer lands under the gravity system of the Shiprock project.

Pumping by means of direct connected turbines to serve the south San Juan unit is favored by the State of New Mexico. Electric pumping to lands immediately above the gravity system should not be considered in the initial phases of development unless it is definitely shown that there is excess water for that purpose and definite proof that such pumping is not only feasible but also desirable. Design of this project should be made on the basis of an ideal annual diversion requirement at the Navaho Dam of not more than 630,000 acre-feet of water.

(2) A San Juan-Chama project to transport water from tributaries of the San Juan River in Colorado to the Rio Grande Basin in New Mexico by means of a transmountain diversion.

This project should be investigated in accordance with the expressed policy of the State that such transmountain water shall be used primarily for domestic, municipal, and industrial supplies and for supplemental use on existing projects with deficient supplies and that preference in the irrigation of new lands shall be given to in-basin projects.

The feasibility report for the San Juan-Chama project must show firm uses for the water diverted and a proposed plan of operation of the project approved by the State of New Mexico which will not interfere with delivery of appropriated or allocated waters within the Rio Grande or other stream basins.

The report for this project should contain a suggested operational schedule to be approved by the Secretary of the Interior and the State of New Mexico, which will protect in-basin uses in their diversion requirement of not to exceed 630,000 acre-feet per year at Navaho Dam.

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.

In accordance with the demonstrated needs for supplemental, municipal, and industrial supplies (including defense installation requirements), this project should be designed to divert an average of not more than 235,000 acre-feet of water per year.

Colorado rights and water uses in the San Juan Basin in accordance with the terms of the compact must be fully protected in the operation of this project.

Values used above have been derived from reports of the Interior San Juan Technical Committee, and are on the same basis as the data submitted in the March 7, 1952, report.

The competition of water between the in-basin and transmountain projects necessitates closely coordinated operation. Neither project can assert a superior right as against the other without virtually destroying the other. Hence, it has been necessary to seek simultaneous authorization and an understanding that the projects will be so operated. It is recognized that the two projects may not be able to proceed simultaneously with construction, and every effort must be exerted to protect each from encroachment by the other.

The Navaho Dam is included as an initial unit of the Colorado River storage project and its early authorization and construction is being sought. This dam is an integral part of the Shiprock project, but it can be constructed and operated as a regulatory reservoir and for the generation of a great deal of much needed hydroelectric power for many years before its full use as an irrigation reservoir is required.

New Mexico desires that the planning of the above suggested projects shall in no way hinder or prevent the orderly development of the Hammond project.

A review of the San Juan problem in New Mexico has been prepared by our State engineer's office. This review sets forth the history of the negotiations and investigations together with a more complete statement of the views and policy of the State. I am enclosing herewith a copy of that document. Additional copies will be made available for the use of your Department if required.

Sincerely yours,

E. L. MECHEM.

Senator WATKINS. Thank you very much.

Senator ANDERSON. May I say that I think the work of your office has been very helpful in bringing parts of our State together so we do have a unified presentation of this plan.

Mr. ERICKSON. Thank you, Senator.

Senator ANDERSON. Mr. Chairman, Senator Chavez has been tied up steadily in a meeting of the health, welfare appropriation group, and if I may I would like to read a statement which he has sent to the committee.

Senator WATKINS. You may proceed.

Senator ANDERSON (reading):

**STATEMENT OF HON. DENNIS CHAVEZ, UNITED STATES SENATOR
FROM NEW MEXICO**

The subcommittee is today holding hearings on an idea for which we have waited at least 30 years—that is, since the Colorado River Compact of 1922. For more than 10 years, New Mexico has had one small project on the upper Colorado River Basin which could have been called up and authorized any time—what we call the Hammond project comprises about 3,700 acres to cost only \$2,302,000. However, that project has never been called up because the State of New Mexico has awaited a comprehensive basin plan for the four upper basin States such as we have under consideration today. I cite this to show that it has been the New Mexico feeling all the way through that the four upper basin States—Colorado, Utah, Wyoming, and New Mexico—move out as a single unit with a joint and beneficial use of the waters.

New Mexico realizes the fact that this is one big plan. We in the Reclamation States learned long ago to map the available waters completely before beginning the building of anything, so that one project is parlayed against another and total beneficial consumptive use is achieved. I would not want the upper basin storage project to move out if Colorado were not ready, if Utah were not ready, or if Wyoming were not ready, but we are ready now and I hope the four States can march in unison to the floor of the Senate to ask what has been our right under the Colorado River compact.

Since technical phases of the projects have been covered in examination of witnesses and will be presented in testimony by engineering authorities, and in order to save time, I shan't go into a recitation of the facts of benefits and costs. Senator Anderson has covered much of the ground.

Senate bill 1555 would recognize the small share of the Colorado River waters which is held by New Mexico under terms of the Colorado River compact and upper Colorado River compact. This bill provides for the ultimate beneficial use and distribution of the waters within New Mexico. It envisions a badly needed irrigation project for the Navaho Indians, the little Hammond project, a larger South San Juan for non-Indian uses, the Pine River extension project, and a transmountain diversion to other needed areas within New Mexico.

New Mexico's position has remained unchanged over the years. We propose to put to beneficial use for both Indian and non-Indian lands in the San Juan County what can be economically justified. By that I mean we will put on San Juan County land, through these proposed

projects, the waters which the land can pay for. What is left will be exchanged to establish a supplemental supply for the Rio Grande Valley—I mean everything below the Willow Creek Dam site on the Chama on down to the New Mexico-Texas State line. Frankly, we expect to materially increase the water supply for the Chama and Rio Grande.

I understand that one of the lower basin States may have questions about this four-State development program. She, or they, should get the answers, if they do not have them already. But you will excuse me if I cannot generate too much interest in this so-called prior use principle. The States, through regulatory agencies, have responsibilities to their residents and their resources.

The erratic flow of the Colorado River was known in 1914, and the Colorado River compact clearly divided the river flow between the three lower basin States and the upper basin States. If, for some reason, more irrigation was allowed in the way of acres than was most certainly known to be the future limit, then the responsibility cannot be transferred ipso facto to the upper States. Each of the lower basin States knew her limits, just as we do in the upper basin, and she held a direct responsibility to plan her developments within the confines of those limits.

I do not charge anyone in the lower basin with any conflicts, but I wish to make clear this sound principle upon which I argue here today. It is not a question of suffering. Do those whose acreage is taken out suffer more than those hungry who are denied?

I do not know just why the President suddenly eliminated New Mexico completely from his legislative proposal. He surprised the Navahos just as much as he surprised the non-Indian enthusiasts. If, as it has been said, the Chief Executive eliminated New Mexico because there were some internal differences in New Mexico, and then most certainly he should have eliminated Echo Park. I have had more mail on this dam than on any one water subject in the last 6 months.

We are not involved in any more of an internal quarrel than any other State. The Governor of New Mexico, a Republican and resident of the lower Rio Grande Valley where some of the opposition started, strongly endorsed the original bill. The good people of San Juan County are here today to tell you they have no serious question about the program. The sole difference in New Mexico seems to be how the State is to hold the water in the transmountain diversion. It has to be held to regulate the flow, to avoid flooding, and to insure a more steady water supply. We have had these internal questions before and we have always resolved them. We shall resolve this one, too.

So far as I know, New Mexico has the only Indian irrigation proposal in this bill. We are quite proud of this proposal because the Navaho is now entering a commercial development period of mining, timber, and agriculture which is remarkable, and this appears to be the great Indian nation of tomorrow. The bulk of the Navaho Reservation lies in Arizona, as does the capital of the Navaho Reservation, and it is probably that out of this Indian project there will be many Arizona-resident Indians who will benefit without Arizona providing any share of the Colorado waters to the New Mexico project. We will not quarrel about this, because we in New Mexico want this Indian

project to become a reality. This should be another monument to New Mexico.

This is not the time for friction between the four upper basin States. It is, indeed, the reverse; the time for unity. If we ever get split up, the upper basin States will suffer for a long, long time. We can be united this one time for the common good, and I hope we go to the Senate, and to the conference with the House, as a single unit, united in purpose and accomplishment.

Senator WATKINS. We will now be in recess until 4:30.

(Whereupon, at 3:50 p. m., a recess was taken until 4:30 p. m.)

Senator WATKINS. The committee will resume the session.

Mr. John Mutz, Bureau of Reclamation, of Albuquerque.

**STATEMENT OF JOHN L. MUTZ, AREA PLANNING ENGINEER,
BUREAU OF RECLAMATION, ALBUQUERQUE, N. MEX.**

Mr. MUTZ. My name is John L. Mutz. I am the area planning engineer, Bureau of Reclamation, Albuquerque, N. Mex. I work under region 5, Bureau of Reclamation, in Amarillo, Tex.

Senator ANDERSON. Would you describe the San Juan-Chama project that was referred to by Mr. Larson in his general presentation? Do you have a map of some kind?

Mr. MUTZ. Yes. The map itself is not very clear, but I will attempt to outline the project to you. After I have given a description of the project, I can read the prepared statement or have it inserted in the record.

The San Juan-Chama project is designed to divert some 235,000 acre-feet of water out of the San Juan Basin in Colorado into the headwaters of the Rio Chama, which is a tributary of the Rio Grande. The diversion plan, as proposed, consists of three regulatory reservoirs on tributaries of the San Juan in the San Juan Basin. It involves about 47 miles of conduit and siphons to transport the water through the Continental Divide and into the head of the Rio Chama.

The plan which we have developed was intended for use by the State of New Mexico in determining how they would like to use their allocation of Colorado River water. As a part of this diversion plan we included four powerplants on the Rio Chama. We then studied the areas in which this water might be used within the Rio Grande and upper Canadian Basins. The proposal we came up with was to develop as much of the tributary areas as we could along the Rio Grande and upper Canadian and to build impounding reservoirs on the tributaries. The increased use of water that would be caused by those developments for supplemental irrigation would be replaced by the imported water. The plan also involved consideration of the future requirements for municipal and industrial water supplies in the vicinity of Albuquerque.

The plan that I am describing also considered some potential use of water below Elephant Butte Reservoir in New Mexico. The plan as we worked it out was based on reconnaissance-type investigation. Some of the investigations were very good, and others were rather preliminary.

The conclusions that were reached as a result of this study were that the project would have engineering and economic feasibility;

that by including the power features the entire project would pay out in some 84 years. That included the power revenues. That, in essence, is what is described in this brief statement that Mr. Larson presented to the committee yesterday.

If you would like for me to read this, I will be glad to.

Senator WATKINS. You may read the statement.

Mr. MUTZ. This concerns the San Juan-Chama project in Colorado and New Mexico.

The San Juan-Chama project would divert water from the headwaters of San Juan River, a principal tributary of the Colorado River, into the Rio Grande Basin for the purposes of providing supplemental water for existing irrigation projects and for providing water for municipal and industrial uses and for development of hydroelectric power. Although water for diversion would be collected from tributaries of the San Juan located in both Colorado and New Mexico, all of the water would be used in New Mexico in the Rio Grande Basin. By exchange the project would also increase the use of water in New Mexico in the Canadian River Basin. The present plan provides for the diversion of 235,000 acre-feet of Colorado River Basin water annually out of the total amount allocated to New Mexico under the provisions of the upper Colorado River Basin compact.

With project development, an adequate supply of excellent quality water would be available to satisfy the rapidly growing municipal and industrial requirements of the cities and towns in the middle Rio Grande Valley area. In addition, water would be available to supplement the now deficient supply to over 200,000 acres of irrigated land in the area. Hydroelectric power would be developed to aid in supplying electrical energy for the development of the resources in the basin.

The plants would be designed and operated primarily to meet peak loads and to permit efficient operation of an integrated fuel and hydro power system. In addition, the project would provide an opportunity for further development of recreation, fish, and wildlife facilities in the center of one of the more important tourist and recreational areas of the country.

Construction features of the project are described under the following three subparagraphs:

(1) Collection and diversion element: Three reservoirs having a total capacity of 190,000 acre-feet located on the West Fork, East Fork, and Rio Blanco tributaries of the San Juan River. A feeder canal and conduit system to collect and transport the water to the head of Willow Creek in the Rio Grande Basin. The conduit system would be about 48 miles in length and would have a terminal capacity at the outlet of the tunnel through the Continental Divide of 1,000 cubic feet per second.

(2) Regulation and power production element: Three reservoirs would be constructed on Willow Creek and the Rio Chama which, when integrated with the existent El Vado Reservoir and the authorized Chamita Reservoir, would provide facilities needed to regulate water releases for irrigation and municipal and industrial uses and for generation of hydroelectric power. Power development would comprise the installation of 145,000 kilowatts of plant capacity, of which 95,000 would be utilized for peaking power and 50,000 for base power. The capacities of the 3 new reservoirs would be 228,000;

400,000; and 40,000 acre-feet. This capacity would be supplemented by the existing 198,000 acre-feet of capacity at El Vado and an additional 85,000 acre-feet planned to be provided in connection with construction of a multiple-purpose reservoir at a site toward the lower end of the Rio Chama as part of the authorized middle Rio Grande project.

(3) **Water-use element:** Construction features for irrigation purposes would comprise regulatory reservoirs, rehabilitation of distribution systems, and some relocation and extension of canals and laterals on existing irrigation projects on Rio Grande tributaries. Water for these projects would be made available by operation under exchange agreements. The present plan does not include construction features for delivery of municipal and industrial water to the cities and towns beyond the reservoirs on the Rio Chama. Such features could be added later as part of the project if the local interests desire Federal construction and financing. Construction of project features would be accomplished over a period of about 15 years, including the installation of all power units.

This statement is based on the physical plan presented in the Bureau of Reclamation's interim report on the San Juan-Chama project dated March 1952. The financial data and analysis of the project was revised in December 1953 to conform to current policy and procedure. Project investigations to date are of reconnaissance degree of detail and the construction costs used, which are based on December 1951 prices, were prepared sufficiently conservative as to require no readjustment for the small change in construction prices since that date. Results of the reconnaissance estimates, along with other project data, are summarized in the attached project summary tabulation.

(The summary tabulation referred to is as follows:)

Summary data, San Juan-Chama project, Colorado and New Mexico

IRRIGATED ACREAGE

New land.....	None
Supplemental.....	over 200, 000
Total.....	over 200, 000

WATER SUPPLY

Average annual increase in diversion of 235,000 acre-feet from storage and direct flow from Colorado River:	
Irrigation.....	113, 900
Municipal and industrial.....	110, 100
Power.....	11, 000
Stream depletion (average annual from Colorado River Basin)...	235, 000

CONSTRUCTION COSTS AND REPAYMENT

Estimated cost-----	\$228, 141, 000
Reimbursable cost allocated to:	
Irrigation-----	99, 308, 000
Power-----	73, 459, 000
Municipal and industrial water-----	55, 374, 000
Total-----	228, 141, 000
Nonreimbursable cost-----	None
<hr/>	
Repayment by—	
Irrigation costs:	
Irrigation water users-----	32, 335, 000
Power revenues ¹ -----	66, 973, 000
Total-----	99, 308, 000
Power costs-----	73, 459, 000
Municipal and industrial water-----	55, 374, 000
Total-----	228, 141, 000
Operation, maintenance, and replacement costs:	
Irrigation-----	306, 000
Power-----	852, 000
Municipal and industrial water-----	114, 000
Total-----	1, 272, 000

Benefit-cost ratio, 1.6 to 1.

¹ Exclusive of replacement storage costs required for the potential Navaho project in the San Juan River Basin and also exclusive of past expenditures for investigations from nonreimbursable Colorado River development fund.

² From Colorado River storage project and San Juan-Chama project.

³ Interest during construction amounting to \$4,028,000 on municipal and industrial water costs and \$2,396,000 on power costs in addition to the amounts shown would be repaid by the project beneficiaries.

Senator ANDERSON. How long have you been associated with this project?

Mr. MUTZ. I have been intimately associated with this project since 1944. The Bureau of Reclamation undertook the first investigation of this project during 1933. In 1937 the National Resources Planning Board included in a plan for the Rio Grande Basin a proposed transmountain diversion. There was very little done on the project until about 1945. Following the war we were able to obtain funds and recruit people to undertake a restudy of this project.

It was not possible to do any specific or definite planning on this project until the upper Colorado River compact was negotiated. That, of course, was 1948 and 1949. Following that the question arose as to how the water should be divided within the State of New Mexico in this allocation to the State.

Through requests of the State of New Mexico and its representatives, the Department of the Interior set up a so-called San Juan Technical Committee. This committee was made up of representatives of regions 4 and 5 of the Bureau of Reclamation and the Bureau of Indian Affairs. We studied very carefully the water supply problem. After the completion of the water supply studies and many preliminary engineering studies, the Governor of New Mexico requested the Secretary of the Interior, I believe in March of 1953, to instruct the proper agencies to undertake feasibility investigations. We are proceeding with those.

Senator ANDERSON. To what extent have you made engineering, hydrologic, and economic studies on the project?

Mr. MUTZ. The hydrologic studies, I would say, are very good, particularly those with respect to the San Juan Basin and the diversion. We had to do those initially for the State to be able to decide how it would recommend that the feasibility studies be made. So I would say they are very good.

Engineering studies on the dams, on the transmountain diversion portion, are what I would call high-grade reconnaissance studies. We had made topography in practically all of the dam sites. We have not drilled all of them. There are 1 or 2 holes at each site. So to complete those studies sufficient for a feasibility report, we needed to carry out drillings at the dam sites in the San Juan Basin.

We feel that we know enough about the geology along the proposed tunnel line so that there is not too much problem there. The cost estimates that are included in this statement have been agreed to by our people in Denver as suitable for presentation purposes. We feel there will be refinements, of course, and perhaps changes between units. But in general, the total cost figure that we have in there of some \$228 million seems to be fairly reasonable.

Senator ANDERSON. You have discussed a project that includes hydroelectric power proposals. While the hearings were in progress on the House side, objections were raised about the large amount of storage proposed on the Rio Chama project. I understand representatives of the State of Texas are going to be here tomorrow, and they will probably object to the storage in connection with this power production.

Could a project be devised, and what sort of a project would it be that would eliminate this objection and thereby eliminate the power development?

Mr. MUTZ. A project could be devised without power. The plan would simply involve the same features for the diversion part with one regulatory reservoir at the head of the Rio Chama system. That reservoir could be offstream on a dry tributary of the Chama.

Senator ANDERSON. So it would not involve waters of the Chama River or mix with the waters of the Colorado?

Mr. MUTZ. There would be no mixing except as the water would be released from this reservoir for use downstream. At that point it would be intermingled with the Chama water.

Senator WATKINS. So that does not present any difficult problem to solve, does it?

Mr. MUTZ. No, sir. It would require simply a system of very careful measuring devices as an operation plan for the river.

Senator WATKINS. It does not require any change in the river channel does it?

Mr. MUTZ. No. There would be no change. It would simply be a matter of conveying the imported water down through the Rio Chama along with the Chama water.

Senator WATKINS. A number of years ago I remember there was a project in New Mexico that had for its purpose the cleaning out of the river channel and removing a lot of growth that had come into the channel. Has that been taken care of?

Mr. MUTZ. That project has been authorized and it is quite well underway. The Bureau of Reclamation is constructing a so-called

water salvage channel above Elephant Butte. The Corps of Engineers have present plans to construct flood-control and sediment-detention dams on several tributaries. We hope before long this complete channelization job will be done so there will be no excessive loss of water to the valley.

Senator WATKINS. What difference would there be in the cost if you have this offstream storage for the water you bring over from the San Juan River watershed?

Mr. MUTZ. The total cost, according to my own estimate, would be \$144 million. That includes more than just the diversion. It would include the cost of the diversion plus the necessary regulatory reservoirs on tributaries to put more water to use in those areas.

Senator WATKINS. All the water you are going to put to use there would be the water you bring from the San Juan watershed?

Mr. MUTZ. Yes, sir.

Senator WATKINS. You do not intend it to interfere with the Rio Grande watershed?

Mr. MUTZ. No. The intention would be to supply additional water to the Rio Grande through this diversion so the supplies that the people within the Rio Grande Basin in New Mexico now have would be supplemented.

Senator WATKINS. What would be the difference in the cost if the water were stored in a reservoir off the channel of the Chama?

Senator ANDERSON. Would it be about \$80 million?

Mr. MUTZ. Yes, sir.

Senator WATKINS. It would cost that much more to store it off-stream?

Mr. MUTZ. No. In our first plan we had powerplants included and power dams. Under this straight water use proposal we would eliminate all except one of the dams. We would still have one regulatory reservoir.

Senator ANDERSON. In other words, the project the way it was planned for power dams ran about \$220 million, and the project without the power dams runs about \$144 million?

Mr. MUTZ. Yes, sir.

Senator ANDERSON. Would that be feasible, do you think?

Mr. MUTZ. It would have feasibility, I am certain.

Senator WATKINS. What would be the cost to be fit?

Mr. MUTZ. It would run about 1.6 to 1.

Senator WATKINS. That is about as good as most of them on the average.

Mr. MUTZ. Of course, the larger benefits are derived from the higher development areas around Albuquerque and below Elephant Butte.

Senator WATKINS. Do you furnish supplemental water for some of that acreage?

Mr. MUTZ. Yes, sir.

Senator WATKINS. Would municipal water be involved?

Mr. MUTZ. Yes.

Senator WATKINS. For what places?

Mr. MUTZ. For Albuquerque, specifically, and perhaps some of the other communities—Belen. Los Alamos is along the line and a supplement supply would be provided to them. Sandia Base and Kirtland Field could also receive water.

Senator ANDERSON. Could you tell me about how long it would take and what work is required to complete reports for this?

Mr. MUTZ. We estimate that it will take about 2 years to complete the feasibility report.

Senator ANDERSON. If this were given the conditional authorization of this bill, you are not going to start out digging a channel in the immediate future?

Mr. MUTZ. No, sir.

Senator ANDERSON. The bill provides a conditional authorization and requires it be resubmitted to Congress. It would be your understanding that after the end of this 2 years when the feasibility report was ready that it might then be submitted to the Congress of the United States?

Mr. MUTZ. Yes, sir. I think the main point is that without the power being included, why the project would of necessity have to be a financially participating project in the upper Colorado River storage plan.

Senator WATKINS. It would have the same benefits in support of the river development, that are included in the comprehensive plan?

Mr. MUTZ. Yes. If the plan were developed without powerplants on the Chama, then of course they would have to get their power from some other source.

Senator ANDERSON. You are using the figure of 235,000 acre-feet. Would you mind telling us where that figure comes from?

Mr. MUTZ. That figure was developed as a result of the studies which were made by the San Juan technical committee which I mentioned earlier, and the State of New Mexico was consulted frequently in the preparation of those studies. After the Department had completed the studies, the State engineer analyzed those studies. As a result of those studies the Governor prepared his letter requesting that feasibility studies be made using the 235,000 acre-feet for the diversion project.

Senator ANDERSON. That was the basis upon which both the Governor of the State and the Secretary of the Interior asked for some preliminary studies on this matter?

Mr. MUTZ. That is correct.

Senator ANDERSON. How much of that \$144 million do you think the water users will pay, both domestic and irrigation?

Mr. MUTZ. I have estimated that they can pay in the neighborhood of forty to fifty million dollars of that.

Senator ANDERSON. Does the percentage of costs that the water users pay compare favorably with the other projects included in S. 1555?

Mr. MUTZ. I am not sure what the others run, but this project—it could be about 30 to 40 percent.

Senator ANDERSON. Do you know that the State of New Mexico wants some current studies made, and the authorization in this bill is for the current studies? Can you tell us what steps are being taken?

Mr. MUTZ. I know they want them because several bonfires have been built under me recently. They have requested specifically that these studies be completed concurrently with San Juan Basin studies. The steps we are taking in region 5 is to concentrate as many of the planning funds as we can get hold of on this job. The regional director has directed us out there to proceed as rapidly as we possibly can.

Senator ANDERSON. Do you have anything else you wanted to add? Feel free to add it if so.

Those are all the questions I have.

Mr. MURZ. I do not think of anything, Senator. I just about ran out of steam.

Senator WATKINS. Mr. Coury.

STATEMENT OF I. J. COURY, INTERSTATE STREAM COMMISSION MEMBER, SAN JUAN COUNTY, N. MEX.

Mr. COURY. Mr. Chairman and members of the committee, my name is I. J. Coury. I reside at Farmington, N. Mex., and I am a member of the Interstate Stream Commission of New Mexico. I am adviser to the New Mexico upper Colorado River commissioner, and I have served in a similar capacity during the negotiations of the upper Colorado River compact. I am secretary-treasurer of the Basin Light & Power Co., the electric utility serving all the San Juan County, N. Mex. I am also director of and executive officer for the San Juan Building & Loan Association.

New Mexico is signatory to two compacts relating to the allocation of the waters of the Colorado River. These compacts were developed to bring the maximum benefits of that stream system. New Mexico is not a direct part of the main stream development. The San Juan River waters, representing an allocation of 11.25 percent of the upper basin's portion, will be the extent of New Mexico's development within the State's border. Such would include the Navaho Dam, and the south San Juan and Shiprock projects and other projects that may be feasible.

I made a statement to the House committee detailing responsibility of the Government to the Navaho Indians. Under the treaty of 1868, certain promises were made which have not been fulfilled. The construction of the Navaho unit will, in part, at least, relieve the United States of some of the responsibility it assumed under the treaty. This phase of the Colorado River project would accrue greatly to the benefit of the Navaho. It would be of untold benefit to all the citizens of the State of New Mexico and especially to those of the San Juan Basin in New Mexico. The general scope of this project has been known since the early 1920's or earlier. When New Mexico became a signatory to the compacts it was the general understanding that these projects would be finally developed. We are now at the crossroads. If these projects are not now authorized or conditionally authorized, there appears to be a question if they will ever be authorized.

We hear talk of further feasibility and later authorization subject to one thing or another. Ideas change, yardsticks become different—who knows what the conditions will be on which to later obtain an authorization of New Mexico projects from the Congress of the United States. Going alone at such time in the future will be difficult, if not impossible.

The Upper Colorado River Commission made a report and recommendation for the upper Colorado storage project and participation projects. New Mexico fully concurred and still does in these proposals and recommendations. To comply with the compact and the agreements and understandings leading to the enactment of that compact requires the complete authority for the entire project. We object

strenuously to any tendency to segregate the project or the plan as originally set forth.

Northwestern New Mexico is an area having great resources in oil, gas, coal, helium, and uranium; and if a bountiful water supply is assured, a great industrial development could and would likely result. Add to this the agriculture development and available power as a consequence of the construction of the Navaho Dam, and the benefits could be much greater than previously reported to the committee.

With the rapid development of the San Juan area now under way, it is not possible to evaluate the potentials that would be derived from the project.

Senator ANDERSON. How long have you been interested in this project?

Mr. CORY. About 16 years.

Senator ANDERSON. Have you been actively interested all that time?

Mr. CORY. Yes, sir.

Senator ANDERSON. I do not think I have ever been to a meeting on this project when I was in the State that you were not there, no matter where the meeting was. Your heart and soul has been in this project for that period of 16 years, has it not?

Mr. CORY. Yes, sir.

Senator ANDERSON. Are there not all over San Juan County and through the town of Farmington dozens of people like you whose heart and soul has been in this project for a long time?

Mr. CORY. Yes, sir.

Senator ANDERSON. And their ambitions and their hopes for the future of that town of Farmington and other towns similarly situated have been intimately tied to the development of this project?

Mr. CORY. It has been their dream.

Senator ANDERSON. Would it be a severe disappointment if the Senate should report this bill without the Navaho Dam in it as an initial project?

Mr. CORY. It would be worse than a disappointment.

Senator ANDERSON. It would be pretty close to a tragedy?

Mr. CORY. That is right.

Senator ANDERSON. Do you subscribe to the statement that was inserted by the State engineer in the record, which was the Governor's program, that there be an investigation of the other projects as rapidly as possible?

Mr. CORY. Yes, sir.

Senator ANDERSON. Therefore, as far as you know, there is no division, at least, between the San Juan area and the upper part of the Rio Grande Valley. There may be some differences in the lower part, but as far as you are concerned there is no division between the Indians and the whites of the San Juan area?

Mr. CORY. No, sir.

Senator ANDERSON. And there is no disposition to quarrel with the position taken by the governor that these projects should proceed on a conditional basis?

Mr. CORY. Not under the premise stated.

Senator ANDERSON. You and the people associated with you are very anxious to see the Navaho Dam underway?

Mr. CORY. Yes, sir.

Senator ANDERSON. I think I have no other questions. I commend you for your continuing zeal.

Senator WATKINS. Mr. Bolack is our next witness. Please come forward Mr. Bolack.

STATEMENT OF TOM BOLACK, SECRETARY-TREASURER OF SAN JUAN BASIN OPERATORS COMMITTEE, FARMINGTON, N. MEX.

Mr. BOLACK. My name is Tom Bolack and my home is Farmington, N. Mex. I am an independent oil and gas operator with production and operations in the San Juan Basin. At the present time I am local chairman of IPAA and secretary-treasurer of San Juan Basin Operators Committee. I wish to lend my support to the State of New Mexico and the Upper Colorado River Commission in urging the authorization of the Colorado River storage project and the participating projects substantially as set out originally in the bills now before this committee.

In that connection I feel that the development of the Navaho project, in particular, would assist in the industrial development of the San Juan Basin—Four Corners area— and ask that consideration be given to this development in the final project plan.

The industrial development of the San Juan Basin and the adjoining Navaho lands depends directly upon the availability of a regulated flow of available waters.

There is a vast amount of raw materials and undeveloped resources in the San Juan Four Corners area. Along with adequate water resources the area contains the following:

(a) 11,170,739 million cubic feet (11 trillion) of gas reserves, hydrocarbon gas of commercial fuel value, as shown in the New Mexico Oil Conservation Commission report of December 1, 1953, and that reserve is being increased daily.

Senator ANDERSON. Could we add that you are helping to increase that reserve every once in a while by bringing in a well of your own?

Mr. BOLACK. Thank you, Senator.

Senator ANDERSON. We are very happy about that.

Mr. BOLACK. Continuing with the adequate water resources:

(b) Several strata or zones of nitrogen gas found at Hogback Pool (near Shiprock), Bountry Butte Pool near Four Corners, and several other widely separated wells in the Four Corners area.

(c) Helium and CO_2 gas has been developed in several pools in southwest Colorado and Four Corners. The largest helium well in the world is near Shiprock, N. Mex.

(d) Eighteen billion tons of available coal at commercial depths in the Farmington-Hogback area. Approximately half of this reserve is situated on Navaho lands; however, its value depends upon industrial development and available water.)

(e) Forty tons of sulfur per day is now being manufactured from one gas field, which is located on Ute Indian lands.

(f) Major uranium and vanadium deposits throughout the Four Corners area.

All the raw materials for any of the many types of petro-chemical are present in sufficient amounts in the area. Oil and gas companies operating in the area have developed gas reserves beyond the present

approved markets, and such gas could well be used in petro-chemical plants.

Forty-three major companies are now operating fifty-one petro-chemical plants throughout the United States. These plants are producing alkyl detergents, methanol, glycol, acetic acid, alcohol, acetone, nylon basics, sulfur, butadiene, and many other associated byproducts and various combinations thereof. Among the 43 companies mentioned, the following majors are active: Atlantic Refining Co., Cities Service Co., Continental Oil Co., Dow Chemical, du Pont, Firestone, Gulf Oil, Humble Oil, Lion Oil Co., Phillips Petroleum, Shell, Sinclair, and Skelly Oil Co.

If a plant comparable to the Lion Oil Co.'s El Dorado, Ark., plant were to be constructed in the San Juan area, it would have the following water requirements: 28,315,600 gallons per day (674,180 barrels), or 87 acre-feet per day would be consumed. This would require 31,755 acre-feet per year. Specifications of this plant and others are shown in the Oil and Gas Journal, Tulsa, Okla., November 2, 1950, issue.

In view of the hundreds of thousands of acres of oil and gas leases now held under lease in the Four Corners area by the above-listed major companies and their presently planned drilling programs, it seems that their requirements of water will greatly increase and a regulated flow would be a necessity in the foreseeable future. It is to be further noted that these companies have leased over 1 million acres of land from the Navaho tribe the last 2 years, and they are spending millions of dollars yearly on development and exploration thereon.

The Utah Construction Co. is core drilling on an 88,000 acre coal option from the Navahos at this time. This operation is to be followed by a large plant on the San Juan River.

Over half of the known reserves of items (b), (c), and (f) of this paper are located on Navaho lands. The value of these reserves depends upon industrial development, which in turn depends on available water.

The Navaho project not only carries the tribe's name, but it holds much of their future lot in life.

(The following sources have been used for the data included in this statement: R. R. Spurrier, director, New Mexico Oil Conservation Commission, report of December 1, 1953; Clarence B. Folsom, Jr., assistant professor of petroleum engineering, New Mexico School of Mines, unpublished reports; and Oil and Gas Journal, Tulsa, Okla., November 2, 1950, issue—Special Petro-Chemical Report.)

Senator ANDERSON. You have been an active oil and gas operator in that field for how many years?

Mr. BOLACK. For 12 years.

Senator ANDERSON. Have you been there since the beginning of the field?

Mr. BOLACK. Yes.

Senator ANDERSON. There was some oil developed years ago, but there has been some recent activity in the field?

Mr. BOLACK. That is correct.

Senator ANDERSON. I ask these questions only because people have wondered what we would do with our water if it became regulated. I am trying to show that we have industry coming along.

Is the gas field now under development in the San Juan area one of the substantial ones as far as this country is concerned?

Mr. BOLACK. I would say it was among the very largest within the continental United States.

Senator ANDERSON. There are two areas thus far: The Mesa Verde formation and the Picture Cliffs. They both seem to be substantial in size, is that right?

Mr. BOLACK. The Mesa Verde field is for 45 miles in width and 90 miles long.

Senator ANDERSON. In the oil country, that is a pretty big field.

Mr. BOLACK. I would say that was one of the biggest.

Senator ANDERSON. Is it not true that just recently there was an announcement by the Federal Power Commission that a pipeline may be developed out of that area?

Mr. BOLACK. Yes.

Senator ANDERSON. If that pipeline actually results and there is a very active market for San Juan and Four Corners' gas in the Pacific Northwest, would that automatically require the drilling of many new wells?

Mr. BOLACK. Many hundreds of wells.

Senator ANDERSON. Three or four hundred, perhaps?

Mr. BOLACK. The ultimate area—that is, semiproven at this time—would require over a thousand new wells.

Senator ANDERSON. So that this is not a fly-by-night area. There is going to be substantial development in the next few years and continued production for a long time to come.

Mr. BOLACK. Yes.

Senator ANDERSON. That pipeline, then, means a lot to the area. You mentioned the petrochemical field. Is it not true that the materials that are up there now are sufficient to supply a very large petrochemical industry if one could be persuaded to establish itself in that area?

Mr. BOLACK. That is true. In fact, there have been companies exploring the possibility of it, some of these major companies I listed.

Senator ANDERSON. All of these things promise that there may be a very substantial increase in population, and, therefore, demand for the agricultural products that might be produced on the Navaho project? I ask that because if we just authorized the Navaho Dam and did not know what was going to be done with the water, somebody might say, "Are you ever going to have any use for the water?"

You have shown that one petrochemical plant of a substantial size would use 30,000 acre-feet of that water in a single year. So if you did not have an agricultural use, you would have an industrial use for it?

Mr. BOLACK. That is correct.

Senator ANDERSON. Thank you very much.

Senator WATKINS. Mr. Murphy, will you be our next witness please?

STATEMENT OF JOHN PATRICK MURPHY, EXECUTIVE SECRETARY, MIDDLE RIO GRANDE FLOOD CONTROL ASSOCIATION

Mr. MURPHY. My name is John Patrick Murphy. I am executive secretary of the Middle Rio Grande Flood Control Association. This association has been authorized by the people of the middle Rio Grande

Basin and the upper Canadian Basin, to appear on their behalf and present the statements prepared by the various communities and areas, showing the desperate need for an additional supplemental water supply.

While endorsing the Colorado River storage project and participating projects as a whole, we are especially interested in that portion of the program dealing with the share of the Colorado River water allocated to New Mexico under the upper Colorado River compact; and we have been authorized to represent the people who are seeking 235,000 acre-feet of water through the San Juan-Chama project.

This organization represents 400,000 people living within that portion of the Rio Grande Valley lying between Elephant Butte Reservoir on the south and the Colorado State line on the north. This area includes the counties of Taos, Rio Arriba, Santa Fe, Sandoval, Bernalillo, Valencia, Socorro, and Sierra. We also represent the people of the upper Canadian Basin, which includes the counties of Colfax, Mora, and San Miguel.

It was recommended by Mr. Elmer K. Nelson, of the staff of the Senate Committee on Interior and Insular Affairs, that—

where a witness in discussing a subject upon which he has already made a detailed statement before the House committee, he should be brief and, for a more elaborate treatment of the subject, refer to the pages in the printed hearings of the House committee where the same can be found.

In compliance with the wishes of Mr. Nelson, I respectfully refer to the printed hearings of the House subcommittee on H. R. 4449, H. R. 4443, and H. R. 4463, January 18 through January 28, 1954, as follows:

Statement of John Patrick Murphy, pages 519, 520, 521, and 522.

Also, throughout the middle Rio Grande and the upper Canadian Basins, literally thousands of farmers, businessmen, and city and county officials attended meetings in unifying their efforts to obtain this urgently needed San Juan-Chama project. They raised money to send witnesses from each community to these hearings. We persuaded them, however, not to burden this committee with so many oral presentations and they agreed. We then acquired written statements from each county on our assurance that we would present them to the committee.

For your convenience, we have taken these statements and have bound them in this folder along with other substantiating data, and out of deference to these splendid but anxious people, we recommend that you read these grassroots statements and then make them a part of your reference file.

Now, likewise, I hope you will read my testimony as mentioned on pages 519, 520, 521, and 522 because I am not going to repeat any of that important dissertation; rather, I am going to use my allotted time in discussing other pertinent essentials connected with our plea for supplemental water in the Rio Grande Basin.

The use of the waters of the Rio Grande to support the economic and cultural development of the valley's peoples has a long, continuous history. Parts of the middle Rio Grande Valley have been irrigated for centuries; first by the Indians, later by Spanish colonists, and then by Anglo-Americans who began settling in the area in the latter half of the 19th century.

Irrigation increased with the growth of population and reached a maximum of about 125,000 acres served in 1880 within that portion of the basin between Cochiti and Elephant Butte Reservoir.

Since that time the general trend has been downward, until today an average of only 75,000 acres are irrigated. The causes of this decline, many of which reflect unnatural uses of the watershed by man, include increasing sediment, rising elevation of the river bed, increasing frequency of floods, and waterlogging of lands.

The people have made various unsuccessful efforts to stabilize conditions and to secure a program of rehabilitation for the area. The latest of these, forced by the continual deterioration of lands, was the formation in 1925 of the Middle Rio Grande Conservancy District. These proud and hardy people bonded themselves and their lands to the utmost limits of \$10 million.

This district, in operation since 1936, has constructed numerous works and other improvements but has not been able to solve the problems incident to a rising river bed.

Finally, it became necessary to turn to the Federal Government for assistance, with the end result that the Bureau of Reclamation and the Army Corps of Engineers cooperated in forming the present comprehensive plan for our valley which includes the following main features:

(1) Rehabilitation of the Middle Rio Grande Conservancy District, including purchase of outstanding bonds of the district by the Bureau of Reclamation.

(2) Flood control and major drainage, including sediment entrapment and reduction of waterlogged areas.

The estimated cost is \$72 million, broken down as follows: Bureau of Reclamation, \$30 million; Army engineers, \$42 million. The Congress authorized this project for appropriations in 1948 and the Bureau of Reclamation phase of this work is well on its way.

The Federal Government now has jurisdiction over the operation of the Middle Rio Grande Conservancy District during the reconstruction period and maintains control of the district until the reimbursable features of the project are repaid. All contracts have been signed and approved by the courts.

The Federal Government also owns and operates the facilities of Elephant Butte Reservoir with appurtenant powerplant and numerous other project works in the lower Rio Grande Valley.

In calling these facts to the attention of this committee, we wish to point out that in the studies made and evaluations arrived at, the Bureau of Reclamation and the people in the Middle Rio Grande Valley took into consideration the ultimate and urgently essential transporting of water from the San Juan into the Rio Grande.

Therefore we feel that unless this committee authorizes our San Juan-Chama project, as a part of the upper Colorado Basin bill, it will endanger the investment of the Bureau of Reclamation in our Middle Rio Grande Conservancy District and could very well be the cause of drying up our valley to the point where our people would lose their means of earning a living and be forced to move out of the valley and abandon their homes. This would be a permanent loss to the Federal Government and a tragedy to the people.

I would also 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.

As already stated, we are not repeating our detailed remarks as rendered before the House committee, but we sincerely hope you will study the significant and salient features of that important testimony, such as:

(1) That our valley area is described as semi-arid with precipitation ranging from 5 to 7 inches per year;

(2) Most of the precipitation in the Rio Grande Basin is through snowfall which occurs in the high mountainous areas;

(3) The principal source of water in the lower elevations, therefore, comes from diverting stream flow and underground pumping;

(4) Population trends in arid New Mexico follow river streams, and the Rio Grande Valley alone contains over 50 percent of the population of the State;

(5) This tremendous increase in population—far above the national average—has created a water problem for all cities and towns in the valley;

(6) The terrific increase in the use of underground water pumped for municipal purposes has decreased the flow of the river, thereby reducing the water supply for irrigation;

(7) Extremely important defense establishments have been located in the Rio Grande Valley. They include the Atomic Energy projects, guided missiles, Air Force bases, and numerous other military installations, all of which require large amounts of water and accentuate our need for this San Juan-Chama diversion; and

(8) There are 6,000 Indians in the valley living in nine pueblos, and as agriculture is their principal economy, they, too, are seriously threatened by this ever-increasing shortage of water from which the region is suffering.

The foregoing factors, coupled with the alarming decrease in precipitation in New Mexico over the past 10 years, demonstrate that this State is headed for water bankruptcy, if not already virtually there.

The desperate need for importing additional water into the basin has definitely been established. The San Juan River is the only source available. It truly is our last waterhole.

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. Therefore, when in 1948 New Mexico was finally apportioned its share of Colorado River water, it immediately became imperative that a plan be developed on an equitable basis to derive the maximum beneficial use of this new unappropriated water.

It was also particularly pertinent that the needs of all the people in New Mexico be carefully considered, so that an agreeable solution could be reached, on the projects to be recommended for ultimate feasibility reports and authorizations by the Congress.

Consequently, therefore, a highly qualified group of engineers was appointed to make comparative studies, involving various combinations of projects, to use San Juan waters within New Mexico's allotment in accordance with the Upper Colorado River Compact.

This eminently qualified group of engineers was called the San Juan River Technical Committee. Other groups and individuals, acting as consultants to this committee, aided materially in the assembling and analysis of data that, after months of careful evaluating, brought forth the following official announcement, in a letter from Gov. Edwin L. Mechem, to the Honorable Douglas McKay, Secretary of the Interior, dated March 4, 1953:

Because of the possibility that legislation will be introduced during the present session of Congress, New Mexico has been obliged to make its own recommendation to you with respect to the feasibility studies it wishes to be made on these projects. This is consistent with the past policy of the Department of the Interior since the Department expects the State to make the final selection of projects.

I, therefore, respectfully request that you direct the proper agencies of the Department of the Interior to study and make feasibility reports on projects in New Mexico utilizing San Juan River water as follows:

(1) A Shiprock project, which will include as a unit of such project the south San Juan project area.

The design of this project should be made on the basis of an ideal annual diversion requirement at the Navaho Dam of not more than 630,000 acre-feet of water.

(2) A San Juan-Chama project to transport water from tributaries of the San Juan River in Colorado to the Rio Grande Basin in New Mexico by means of a transmountain diversion.

In accordance with the demonstrated needs for supplemental, municipal, and industrial supplies (including defense installation requirements), this project should be designed to divert an average of not more than 235,000 acre-feet of water per year.

Neither project can assert a superior right as against the other without virtually destroying the other. Hence, it has been necessary to seek simultaneous authorization and an understanding that the projects will be so operated. It is recognized that the two projects may not be able to proceed simultaneously with construction, and every effort must be exerted to protect each from encroachment by the other.

So, we not only ask this committee to recognize that New Mexico has great need for the beneficial consumptive use of all of its water, but we also plead for understanding consideration of the interrelationship between the projects as discussed in the preceding pertinent quotes from Governor Mechem's letter.

Furthermore, we want to state that we in New Mexico feel that the Congress should approve the entire Colorado River storage project and participating projects. We look upon this as a carefully thought out comprehensive plan that contains a blueprint for each State in the upper basin to follow.

In evaluating the several purposes to be served by the storage division, the fundamental purpose is that of providing holdover storage for essential river regulation in order to make possible consumptive uses of apportioned waters within the compact and at the same time provide for obligated deliveries to the lower basin.

Also, a regulated river system would assure the production of firm hydroelectric energy at these upper basin dam sites, the revenues from which will assist in the payout of reimbursable costs.

Furthermore, it is our contention that the participating projects cannot be considered separate and apart because they are an integral part of the upper basin master plan. The schemes for the participating projects were developed after years of careful investigation, and they are of paramount importance in the blueprint of each State,

because they are the principal consumptive use projects in the basin plan.

To this degree or extent, therefore, it seems evident to the people in New Mexico that, as this overall plan was formulated as a comprehensive upper basin development, there is a definite interwoven unity of purpose; hence, it is our sincere hope that the Congress will authorize all of the features as originally presented in the bill prepared and agreed to by the Upper Colorado River Commission, even though some of the projects are limited to provisional or conditional authorization pending completion of feasibility reports.

Senator ANDERSON. You recognize what you have referred to as the bill agreed to by the Upper Colorado River Commission is the text of S. 1555?

Mr. MURPHY. That is right. Thank you.

Likewise, we all feel that no unit or project should carry priority over the other; and if one part is authorized and another part fails to get simultaneous recognition, there would be the tendency or perception to assume granting of precedence with prior authorization.

Senator WATKINS. You do not mean by that statement that all the project units have to be started at the same time, do you?

Mr. MURPHY. No. We are just asking for recognition, whether it is provisional or conditional, just so we are recognized in the bill and not deleted like we were on the House side.

Senator WATKINS. I want to be sure about that because we must face a practical situation. If we waited until every one of the projects were in condition so that construction could be started, we probably would be delayed for years before we got anything going. We have to take those that are ready. And we have to have faith and confidence in each other that we will proceed with the others as rapidly as they are ready and as rapidly as Congress can provide the money.

Mr. MURPHY. Just so long as they are recognized in the plan.

Senator WATKINS. I wanted a clear understanding on that.

Mr. MURPHY. It is the consensus that our New Mexico projects were deleted from the bill by the House committee, merely because we did not have completed feasibility reports to present.

We want it known that we ourselves do not fully understand why the Bureau of Reclamation has allowed the feasibility reports of New Mexico projects to lag behind reports on projects of other States that are included in the bill. In any event, suffice it to say this lag has been beyond the control of the State of New Mexico.

Speaking on behalf of our San Juan-Chama project, the present status of that report is termed reconnaissance; however, it is far enough advanced to give positive assurance that the project is feasibly sound, and the ratio of benefits is above the average of the majority of the other participating projects. The Bureau of Reclamation has stated for the record that it is a worthy project and can readily be justified, although the feasibility report is not completed. The Bureau also stated for the record that they would not object, if the Congress saw fit to authorize it at this time.

The bill as sponsored by the Upper Colorado River Commission and as originally introduced in the Congress provides for a careful screening of these participating projects, and they must comply with the qualifying criteria as set down by the Congress. Hence, we are pleading with this Senate committee for provisional or conditional author-

ization at this time of New Mexico's projects so that we may thus be assured of equal recognition with the other units of the upper Colorado River comprehensive plan.

The provisional authorization of our San Juan-Chama project would not call for the expenditure of any money, and the project would not be constructed nor appropriations made therefor unless and until Texas or any other affected State had full opportunity to examine the completed plans for the project and to make certain that the proposed method of operation would not injure the State of Texas or the Elephant Butte project.

I would like to interpolate at this point in order to focus your attention on a matter which has us flabbergasted.

When we in the middle valley testified on behalf of our San Juan-Chama project before the House subcommittee, we were surprised and shocked to find that the lower valley of New Mexico and Texas was going to oppose our project. Now, the middle valley of New Mexico does not seek to take any water away from the lower valley in New Mexico; rather, our thoughts and planning in bringing in 235,000 acre-feet of new unappropriated water from another river basin into the Rio Grande definitely would mean that the lower valley in New Mexico would share greatly in what might be termed an urgently needed windfall.

Insofar as Texas is concerned—although they cannot enjoy a direct allocation of San Juan River water due to the restrictions of the upper Colorado River compact—certainly they should realize that nothing would be done to decrease delivery of Rio Grande water to the State of Texas.

The water troubles we are now experiencing in the Rio Grande are caused by prolonged drought and lack of tributary inflow, with the consequent shortage of delivery to Elephant Butte Reservoir, as computed by the lower valley in their interpretation of the Rio Grande compact.

Therefore, any shortage of delivery is through lack of water, rather than through any action on our part. To the contrary, we are doing everything in our power to reduce waste in operation, even by channelizing the lower reaches of the valley which is way beyond the boundary of the Middle Rio Grande Conservancy District.

The work already accomplished by this channelization program in the lower reaches—though an area silted up on account of the operations of Elephant Butte Dam—has within the past year salvaged over 100,000 acre-feet of water for the lower valley.

The project under which this salvaging program was achieved was sponsored by the people of the middle Rio Grande Valley and certainly shows our earnest intent to operate in such a manner as to deliver the duly apportioned waters of the Rio Grande to the lower valley.

In any event, we contend that we have not illegally withheld any water from the lower valley in New Mexico, and, also, they should be realistic in the matter and acknowledge this shortage of water to be an act of God, and not anything that can be settled in the courts.

One cannot get water out of the courts, but in this particular case the lower valley in New Mexico would be assured of an increased supply of water if they would only agree to sit down with our State engineer and the Bureau of Reclamation and figure out just how this

additional flow of water from the San Juan should be regulated for the essential benefit of all and to the detriment of none.

Another reason why we were surprised is because we most certainly thought that the people in the lower valley of New Mexico would be eager to file on a major portion of this new unappropriated water. Instead of that, for reasons beyond our comprehension, they are opposing this increased flow into the Rio Grande.

Senator WATKINS. Do you have any return flow to the stream by reason of the irrigation or the putting of water on lands at higher elevations?

Mr. MURPHY. Yes; around 50 percent.

Senator WATKINS. Do you attempt to follow the return flow and to recapture it as a water right?

Mr. MURPHY. Yes, as it goes on down the river, we use it and reuse it.

Senator WATKINS. You are able to establish that it is your water and you are able to identify it?

Mr. MURPHY. Yes, because under the compact it depends on the amount of water that comes in at the gaging point at Otowi and then is delivered at the gaging point in San Marcial. But when this was set up the tributary inflow was supposed to be a major portion of that water.

Senator WATKINS. I am talking about the return flow that comes as a result of the application of water on lands to the side of the stream as it gets back in.

Mr. MURPHY. We have no way of measuring that.

Senator WATKINS. You do not attempt to follow the claim?

Mr. MURPHY. No.

Senator WATKINS. On many streams the return flow is used time and time again as it goes downstream, and it is an essential part of the water rights. No one above can sell the rights or divert them anywhere else because it would interfere with the rights of that return flow.

Mr. MURPHY. If I am wrong on that, I would like to have our State engineer answer that question.

Senator WATKINS. It is not important. I wondered why these people down in the valley were objecting. If you are not following that water, it would increase their supply.

Senator ANDERSON. Mr. John Gregg is here, and he is expected to testify tomorrow on that point.

Mr. MURPHY. That is the only reason I am putting in this interpolation, because they are here.

Our Governor and our State engineer worked like Trojans on a basis for studying the potential uses of this water and finally suggested that feasibility reports be prepared on the basis outlined in the Governor's letter of March 4, 1953. The people of San Juan County have agreed to that basis for these reports, and we in the Middle Valley feel that was really magnanimous of our good neighbors to the north.

Of course, we all appreciate that it would be impossible to get unanimous agreement from the people in San Juan, and we are aware that a small minority would still like to block the diverting of this water; but the thing we will never understand is why the only witness from lower New Mexico had the temerity to present for the record

statements from that small minority in San Juan County opposing this transmountain diversion. (See p. 657 in the printed hearings of the House committee.)

The same witness in answering questions propounded by Congressman A. M. Fernandez (see p. 667) stated that:

Giving only my own personal opinion, if the reservoirs were eliminated and if we could be positive that the diversion could be properly regulated so that there would be no shortchanging in our water supply, we would probably have no objection to the authorization for construction of the San Juan-Chama project, insofar as our own situation is concerned.

This same witness in lower New Mexico also went to great lengths in pointing out that Albuquerque was not entitled to file on water for municipal use that could only be made available by the Federal Government constructing the San Juan-Chama project. Yet it was brought out in testimony (see p 679) in referring to the city of El Paso, Tex., that:

The city has purchased slightly more than 1,400 acres of first-class waterright lands within the Rio Grande project. By reason of the ownership of those lands, the city is entitled and does run the water to which the lands would be entitled, diverts them out of one of the project facilities, puts the water through its treating plant and then into the mains.

And also that:

There is a contract between the city and the water district approved by the Secretary of the Interior, whereby during the nonirrigating season (that means principally in the winter months) the city uses what is called return flow water; water that has been put on the lands, has percolated through the soil and gone back into the drainage ditches and from there into the river.

The city, under the contract, is entitled to use that water and pays a specified consideration.

There certainly does not seem to be an consistency in the arguments of the opposition from the lower valley of New Mexico. This party stresses the need for more water in the Rio Grande, but he is afraid that if we get 235,000 acre-feet of water transported from another basin and mix it with Rio Grande water the net result will be less water. It is hard to conceive how anyone in New Mexico can get so mixed up.

I hope I have made my point clear. This ends the interpolation. Now back to the concluding remarks in my prepared statement.

Page 10, the third paragraph, please.

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.

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 other witnesses in urging favorable action on the request for authorization of the Colorado River storage project and participating projects which, for reasons clearly stated in our letter directed to the committee, definitely should include at least provisional authorization for the San Juan-Chama project.

I appreciate very much this opportunity to appear before your committee, and on behalf of the Middle Rio Grande Flood Control Association and the 400,000 persons whom we represent, I wish to say thank you.

Senator ANDERSON. Mr. Chairman, if we could get the testimony of Mr. Ball, who is the engineer of the Middle Rio Grande Conservancy District, then we would complete all the testimony from New Mexico, with the exception of the testimony by the Navaho Indian tomorrow morning and the testimony by Mr. Gregg which would come in connection with the statements to be made by those from Texas.

I would like to get Mr. Ball on the stand and have his testimony go in the record this afternoon.

Mr. MURPHY. I would like to ask permission to insert in the record a statement from the Honorable Clyde Tingley, member of the City Commission of the City of Albuquerque, speaking for the water needs of Albuquerque.

Senator WATKINS. It will be received in the record, and the book that you have submitted containing the statements of witnesses who were going to come but did not will also be received for the files.

(The material referred to follows) :

STATEMENT OF HON. CLYDE TINGLEY, MEMBER, CITY COMMISSION, OF
THE CITY OF ALBUQUERQUE

My name is Clyde Tingley. I am a member of the City Commission of the city of Albuquerque and have been a member of the governing body of the city of Albuquerque for the past 30 years, except 4 years (1935-38) when I was Governor of the State of New Mexico.

I appear before the committee in support of a bill to authorize the Secretary of Interior to construct, operate, and maintain the Colorado River storage project, which includes the San Juan-Chama project as a participating project, to divert a water supply into the Rio Grande Valley from the San Juan Basin.

I am thoroughly familiar with the problems of the city of Albuquerque in reference to its water supply. One of our main problems the past several years has been to plan for an adequate surface water supply to meet the city's future needs.

Albuquerque is one of the fastest growing cities in the United States and is still growing rapidly. In 1950 the official population was 97,012. At the end of 1952, according to estimates based on water connections and other reliable information, it had increased to approximately 140,000. It has shown a healthy growth every year since the first official census in 1860.

Estimates of future population vary widely. For the year 1960, the minimum estimate, lowest of three trends recently calculated by engineers employed by the city, is 165,000. Another reliable estimate made by the Natural Gas Co. is 253,000. Several estimates, including two other possible trends calculated by our engineers, lie between these

extremes. Any conservative plan must visualize enough water for 250,000 people by 1960.

The present source of our water supply is from wells located in the saturated valley fill. This source is satisfactory at present; however, we are extending the well fields farther, both up and down the valley, each time we expand the capacity of our system. We are aware that the amount of ground water available for recharge is unknown, and the effect of the pumping on the flow of the Rio Grande has not been determined. We are also aware that all other important cities depending upon ground water as their source of supply have eventually reached the point where the supply becomes inadequate or litigation results over the rights to the limited available supply.

The only source from which Albuquerque can obtain a surface water supply is by means of a transmountain diversion described in the bill now before the Congress as the San Juan-Chama project. The city has cooperated fully with the State of New Mexico in the preparation of a comprehensive plan and report, which shows the city's needs for municipal uses and a reserve for its requirements for future development. I cannot emphasize too strongly the importance of this project to the future of the city of Albuquerque and its inhabitants.

I sincerely hope that this committee will approve the bill to authorize the entire Colorado River storage project, as it is necessary if the four upper Colorado River Basin States, including New Mexico, are to develop their natural resources. I also sincerely hope the San Juan-Chama diversion will be included as one of the participating projects for the good of the entire Middle Rio Grande Valley.

Senator WATKINS. Mr. Ball.

STATEMENT OF HUBERT BALL, CHIEF ENGINEER OF THE MIDDLE RIO GRANDE CONSERVANCY DISTRICT

Mr. BALL. My name is Hubert Ball. I am chief engineer of the Middle Rio Grande Conservancy District.

I made a statement before the House committee which appears at page 529 of the hearings before the House Subcommittee on Interior and Insular Affairs, on H. R. 4449, H. R. 4443, and H. R. 4463, January 28, 1954. I do not desire to repeat what I said there. However, I do want to express the desires of the people of the Middle Rio Grande Conservancy District that the bill before the committee be authorized in conformity with the terms of the present bill.

We are sincerely in favor of the projects, both in San Juan and in the Middle Rio Grande Valley, which will be benefited by this legislation. I want to emphasize further that if the transmountain diversion can be authorized, it will go far toward solving the difficulties New Mexico has had in reference to its water supply in which both Texas and New Mexico are involved.

New Mexico is entitled to 11¼ percent of the water allocated to the upper Colorado Basin States. This amount of water is considerably in excess of that amount which might be economically and feasibly used within that part of New Mexico lying within the San Juan Basin. Now, we certainly and most sincerely protest that we have never desired or expected to use one single drop of that water which can be put to beneficial use at a reasonable cost in the San Juan Basin.

However, we do desire and expect to secure and use as much as 235,000 acre-feet of water within the Middle Rio Grande area.

It is our firm belief that there is this amount in excess of any possible uses which might be met in the present or in the foreseeable future in the San Juan Basin. The only way that these problems can be solved and this water made available to the many municipalities and farmers within our area is through the authorization and construction of the Navajo Reservoir and the San Juan-Chama transmountain diversion.

We realize that the financing of such a tremendous project will be a most stupendous undertaking; however, we submit that the price of water for the above-mentioned purposes is impossible to estimate. People and animals must have water to drink, and a price for water for one purpose might be exorbitant when the same price for another, such as human consumption, might be negligible.

There are many other uses to which portions of the water transported over the divide could be placed, such as the development of power, recreational purposes, preservation of fish and wildlife, and industrial uses. However, these subjects, I am sure, will be mentioned more specifically and covered by other witnesses and other statements which will be submitted to you in support of the authorization and construction of units of the upper Colorado Basin projects which are required to guarantee to New Mexico their equitable share of the Colorado River.

The Middle Rio Grande Conservancy District has made a sincere effort to live up to the Rio Grande compact and to distribute, as fairly as possible, water to all of the various users; however, our task would be made possible of accomplishment with the authorization and completion of this project.

We wish to point out, also, that all of these things are of an emergency nature and that quick action will be necessary to avert what could be a catastrophe to our area as well as the entire State of New Mexico.

Senator ANDERSON. I do want to ask some questions. I am not going to ask as many as I otherwise might.

In previous testimony on this matter you brought out that there are three main difficulties causing the Middle Rio Grande Conservancy District and the State of New Mexico trouble in trying to operate within the Rio Grande compact. The first of these is the increased natural water losses throughout the valley from nonbeneficial use. Do you feel this has affected the surface supply?

Mr. BALL. It is very definitely affecting the surface supply in our area, but much more particularly in the area served by Elephant Butte, which is below the Middle Rio Grande Conservancy District boundaries.

Senator ANDERSON. You think much of the nonbeneficial water consuming is downstream from district lands?

Mr. BALL. It is downstream from our district.

Senator ANDERSON. Is that the most serious of the problems you have?

Mr. BALL. It is at the present time.

Senator ANDERSON. Is it getting any worse?

Mr. BALL. We are engaged—I say “we”; the Bureau of Reclamation—in a project sponsored by the Middle Rio Grande Conservancy

District engaged in the channelization project through that area which should alleviate it to a great extent. It is possible that after the completion that we could break even on the losses through that particular area.

Senator ANDERSON. You mentioned a second difficulty. You said that there was a deficient tributary inflow between Otowi and San Marcial. Does that affect the supply to the conservancy district?

Mr. BALL. It very definitely affects the supply. At the time the Rio Grande compact was negotiated there was a serious shortage of water supply records, particularly on the tributaries which enter the stream between Otowi and Sam Marcial. They were overestimated, and as a result the Middle Rio Grande Conservancy District has been faced with an impossible task of supplying water which is not existent.

Senator ANDERSON. The third difficulty was increased pumping for domestic and industrial use. Does that affect the district?

Mr. BALL. The water pumped from the Rio Grande Valley, particularly in the floor of the valley at Albuquerque, Los Alamos, and other such communities very definitely and directly affects our water supply.

Senator ANDERSON. Do you think as much as 60,000 acre-feet is being pumped from the valley floor?

Mr. BALL. I believe there is that amount being pumped from the valley floor at the present time.

Senator ANDERSON. It is not only a great increase in the size of Albuquerque, but you have a whole new town like Los Alamos using the water, so it is time we started a project along the river?

Mr. BALL. The Government built Los Alamos, and they have to have water up there.

Senator ANDERSON: Is there any way of stopping this pumping?

Mr. BALL. No, sir. The people have to have water, and there is no practical way you could eliminate the use of water by those municipalities.

Senator ANDERSON. When we have had discussions of this previously, all of the conservancy district counties have had an organized agricultural group testifying on the need for supplemental water to permit the growing of more productive cash crops. Does your experience bear that out?

Mr. BALL. It certainly does. The farmers in our valley are woefully short of water and have been for a number of years.

Senator ANDERSON. You have had water shut off already this year?

Mr. BALL. We went down and told them not to water at your place for the past 2 weeks.

Senator ANDERSON. In view of that condition, about how much of the San Juan-Chama water do you think the district will need?

Mr. BALL. I think the district could very easily use an average of approximately 40,000 acre-feet annually.

Senator ANDERSON. Would the amount of water you mentioned permit the district to operate within the provisions of the Rio Grande compact?

Mr. BALL. I believe it would.

Senator ANDERSON. Would that be desirable?

Mr. BALL. Particularly to the lower portions of the State and to us.

Senator ANDERSON. It would be very desirable right in our own valley. We would like to be operating in full compliance of that compact.

Mr. BALL. We certainly would.

Senator ANDERSON. Somebody is going to have to pay for additional water brought in the valley. Would you think the district would feel like paying for some of this water?

Mr. BALL. Senator, I might explain it this way: At the present time there are a great number of farmers who are attempting to pump sufficient water to supply supplemental water to their farms. It most definitely would be cheaper to pay for water from a trans-mountain diversion than it would to pay an electric light bill.

Senator ANDERSON. Do you know one farmer who has pumps all over his farm?

Mr. BALL. I sure do, and I bet his power is high.

Senator ANDERSON. I saw one bill for one of my pumps one time, and I was almost through pumping.

Do you think the district would be able to pay a reasonable price, then, for this water if it was brought in for irrigation purposes?

Mr. BALL. Yes, sir. The farmers of the valley certainly would be able to pay.

Senator ANDERSON. Thank you very much.

Senator WATKINS. We will adjourn until 10 o'clock tomorrow morning.

(Whereupon, the committee recessed, to reconvene at 10 a. m., Wednesday, June 30, 1954.)

COLORADO RIVER STORAGE PROJECT

WEDNESDAY, JUNE 30, 1954

UNITED STATES SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m., in room 457, Senate Office Building, Washington, D. C., Senator Arthur V. Watkins, Utah, presiding.

Present: Senators Arthur V. Watkins, Utah, and Clinton P. Anderson, New Mexico.

Present also: Senator Thomas H. Kuchel, California; Elmer K. Nelson, staff consulting engineer; and N. D. McSherry, assistant chief clerk.

Senator WATKINS. The committee will come to order.

The first witness this morning will be the Honorable Ivan C. Crawford, director, Colorado Water Conservation Board.

STATEMENT OF IVAN C. CRAWFORD, DIRECTOR, COLORADO WATER CONSERVATION BOARD

Mr. CRAWFORD. Mr. Chairman and members of the committee, my name is Ivan C. Crawford. I am the director of the Colorado Water Conservation Board, an official State agency. On behalf of the board, I appear here in support of the bill authorizing the upper Colorado storage projects and participating projects generally but particularly in support of the five participating projects located in the State of Colorado.

Four of these projects—Paonia, Smith Fork, Florida, and Silt—have a common characteristic: They are primarily projects which seek to bring a supplemental supply of water to land already under irrigation and, in addition, each one brings in some new land, smaller in area than the portion securing supplemental water. The Pine River extension project, the exception in this respect, brings new land under irrigation; however, the project is, as the name implies, an extension of a project already in existence.

I should like to present the salient characteristics of these projects. They have all been investigated and reported on by the Bureau of Reclamation. In each case the benefit-cost ratio has been found to be greater than 1; in each case it has been found that it will be necessary for the proposed upper Colorado River storage account to furnish a considerable portion of the funds required to bring the projects into existence.

The Paonia project: Studies were initiated on this project by the Bureau in 1936. It was authorized for construction on March 18, 1939,

by Presidential approval of the findings of feasibility of the Secretary of the Interior. On account of encountering unsatisfactory dam foundations at locations specified in the 1939 authorization, a revised report was rendered in 1940. Further studies were retarded by World War II, and on this account a second revised report did not come out until 1946. The lands embraced in this report consisted of 14,830 acres requiring supplemental water and 2,210 acres of new land.

The second revised report was approved and adopted by the Under Secretary of the Interior and the project was authorized by the 80th Congress on June 25, 1947. But even with this positive action the objective has not been reached. On August 8, 1948, all bids for the construction of the proposed dam were rejected because they were too high. Contracts were let for the enlargement of a canal connected with the project and this work was completed in the spring of 1951.

As originally conceived the project consisted of 12,750 acres requiring supplemental water and 2,000 acres of new land. A revised plan of development worked out in 1947 adds 2,000 acres, known as the Minnesota division to this acreage.

The sustained drive to secure this project is based on the fact that in years of low runoff, under present conditions there is a partial or complete crop failure in the area. Apples, peaches, alfalfa, barley, wheat, and oats are the principal crops. Lands range from 5,400 to 6,800 feet above sea level. In the average year there are 160 frost-free days.

The farmers' ability to pay has been found to be approximately 41.5 percent of the cost per acre. The benefit cost ratio determined by the Bureau is set at 1.24.

Senator WATKINS. Would you stop just a moment?

I think we have some maps for these various projects. It would be helpful, probably, for the members of the committee to have the maps put up as each project is mentioned.

Mr. CRAWFORD. It is immediately under this map on the second stand, Senator.

Senator WATKINS. Mr. Crawford, which tributary of the Colorado is that on?

Mr. CRAWFORD. That is on the Gunnison. We are about through with that. Smith Fork is the next one. If they remove that map, we will have them all shown on the underlying map in their proper relations. That shows just one project. All of them are shown underneath, on the underlying map.

Senator WATKINS. The one that has been hanging there?

Mr. CRAWFORD. The one that is under that map.

Senator WATKINS. Yes, I see it now.

Mr. CRAWFORD. You will note from this map the position of Paonia, the project just described. The next one is Smith Fork.

Senator WATKINS. Is that on the Gunnison, too?

Mr. CRAWFORD. That is on the Gunnison also, yes.

Senator WATKINS. Proceed.

Mr. CRAWFORD. Smith Fork. This project is located within a few miles of the Paonia. The lands are at an elevation which varies from 5,450 to 7,200 feet. The Bureau report states that there are an average of 137 frost-free days each year.

Supplemental water is required for 8,160 acres; new land will be brought in to the extent of 2,270 acres.

On this project, the farmers' income is derived principally from the sale of livestock and livestock products. A large portion of the area is devoted to the production of hay, small grains, and pasture. An inadequate supply of late season water cuts down the productivity of the land. Pastures, especially, suffer from the lack of water since they receive little after the middle of the summer.

The proposed additional water supply would improve the situation to the extent that average shortages of water would be reduced to 4 or 5 percent. At present shortages may be expected to reach 4 percent.

The repayment period is set at 50 years. Benefit-cost ratio has been determined as 1.15. The farmer will be able to pay 27.4 percent of the cost per acre.

The next is the Pine River extension. You will notice that down toward the lower right-hand corner, almost on the New Mexico boundary.

Senator WATKINS. Is that on the San Juan?

Mr. CRAWFORD. That is on the San Juan, yes.

Pine River project extension differs from the other Colorado participating projects in that there is no question of supplemental water involved. The extension would bring new land under irrigation. The Pine River project insofar as the dam was concerned, was completed in 1941. It consists of the Vallecito Dam and Reservoir on Pine River in southwestern Colorado. The reservoir furnishes supplemental water to an area already under irrigation when the dam was constructed. The remainder of the project, consisting of new land, was not undertaken at that time. It forms the present proposed Pine River project extension.

The project provides a full supply of water for 13,210 acres of non-Indian land and 1,940 acres of Indian land. The lands lie at an elevation of 6,000 to 7,000 feet and would produce early maturing grains, forage crops, pinto beans, and some potatoes, the most of which would be consumed locally. The farmers' ability to pay per acre has been set at 37.1 percent of the cost. The benefit-cost ratio for the project is 1.85.

The Florida is in the same neighborhood. This project is located within a few miles of Durango, the largest town in southwestern Colorado and also within a few miles of the Pine River project extension.

Senator WATKINS. Is that on the San Juan?

Mr. CRAWFORD. That is on the San Juan, too. 18,950 acres are involved; 1,000 of these are in Indian ownership. 12,650 acres require a supplemental water supply and 6,300 acres are new land. The project is at an elevation of 7,000 feet. There is an average frost-free period of 109 days. Crops suitable to the project are early maturing grains, pinto beans, potatoes and apples.

Estimated repayment by the farmer is 18.6 percent of the cost. The benefit-cost ratio is 1.24.

Now we come to Silt, which is up on the main stem of the Colorado, up about the middle of the map and a little to the right, near Glenwood Springs, between Grand Junction and Glenwood Springs.

The Silt project lies north of the Colorado River between the towns of Rifle and New Castle in west-central Colorado and about 65 miles east of Grand Junction.

Under the plan developed, 5,400 acres would receive supplemental water and 1,900 acres of new land would secure a full supply. With a sufficient water supply, net farm incomes will be increased from \$400 to \$1,400 on different areas in the project. At the time the report was compiled these incomes were as low as \$581 per year.

The frost-free period in this locality averages 123 days. The elevation is in the neighborhood of 5,600 feet. Alfalfa, small grains, sugar beets and potatoes will be the principal crops. The raising of beef cattle and sheep is an important item in the economy of the area. Dairy cattle have become a significant part of the livestock industry here.

The farmers' share in the repayment program has been found to be 28.0 percent of the cost. The benefit-cost ratio is 1.62.

At the bottom of that page I have a table which shows the quantities which I have been reading to you in the first place, the supplemental land involved in these 5 projects amounts to 41,000 acres. The new land is 27,000 acres and that includes approximately 15,000 acres of new land in 1 project, the Pine River extension. The repayment by the farmer varies from a low of 18.6 percent of the cost to a high of 41.5 percent of the cost.

You will note that the benefit-cost ratios are all well above unity or well above one.

(The table referred to follows:)

Colorado participating projects

Project	Land (acres)			Benefit-cost ratio	Repayment by farmer
	Supplemental water land	New land	Total land		
Florida	12,650	6,300	18,950	1.24	<i>Percent</i> 18.6
Paonia	14,830	2,210	17,040	1.21	41.5
Pine River extension		15,150	15,150	1.85	37.1
Smith Fork	8,160	2,270	10,430	1.15	27.4
Silt	5,400	1,900	7,300	1.62	28.0
Total	41,040	27,830	68,870		

Mr. CRAWFORD. In all cases, the projects now being considered complete a project already in existence. In 4 of the 5 cases the procurement of supplemental water that will increase and insure crop production is the basic reason for the project. In the fifth case, an extension is called for that completes a project begun some years ago.

The completion of these projects will, as the expression goes, firm up water supplies for existing units, make them whole and complete, raise the income of the farm families involved, and in the case of the southwestern projects near the uranium area, lay the foundation on which to build a larger industrial economy. The Silt project will be adjacent to the oil shale area now in the initial stages of development near Rifle, Colo.

I should like to interject at this point a reference to the House hearings held this past spring, about page 308 or 309, where a thorough

description is given of the potential energy which is found in this area in the form of oil shale and the promise which is made on account of this area to make a large industrial economy in the western part of Colorado, in the almost immediate future.

Senator WATKINS. That will mean a lot of water for consumptive use, will it not?

Mr. CRAWFORD. Yes.

The Paonia project deserves especial emphasis. It has been in a partially completed stage since 1951, and has been authorized and reauthorized. Several reports have been written, a canal enlarged, but the main item, the activator of the entire project, the dam, exists only on paper.

Senator WATKINS. Is it necessary to have the dam in order to get more water?

Mr. CRAWFORD. Yes, to complete the project, to store water, to spread it more evenly over the summer period.

Senator WATKINS. In other words, a regulator for the water supply.

Mr. CRAWFORD. Yes.

As a concluding item in my presentation I should like to give you the resolution passed by the Colorado Water Conservation Board on January 14, this year, relative to this Colorado River project and the participating projects contained therein.

Senator WATKINS. If you have it attached, we can make that a part of the record.

Mr. CRAWFORD. I have a certified copy which I will submit, and I would like to make it a part of the record.

Senator WATKINS. Do you want to read it?

Mr. CRAWFORD. Yes, I do. Is that permissible? I think it will call your attention to some testimony that is to be given a little later this morning and lay the foundation for it.

Senator WATKINS. All right.

Mr. CRAWFORD (reading):

Whereas the Colorado Water Conservation Board has given consideration to the report of the Secretary of the Interior, dated December 22, 1950, on the Colorado River storage project and participating projects, and to the supplemental report, dated December 10, 1953, of the Secretary of the Interior on the same subject; and

Whereas the board, in an endeavor to ascertain the attitude of all interested areas and citizens of the State of Colorado in regard to the position which Colorado should take on such reports, did at its February 17, 1953, meeting create the Colorado Conference Committee to study the use of Colorado River water in Colorado and particularly the proposed transmountain diversion by Denver from the Blue River; and

Whereas such reports have been made and the conference committee has reported to the board; and

Whereas in a further effort to reconcile conflicting views as to the use of Colorado River water without the natural basin in Colorado the board did on December 30, 1953, appoint a mediation committee, which has this day reported that it could come to no agreement: Now, therefore, be it

Resolved by the Colorado Water Conservation Board, the official State agency which is charged by law with the duty and responsibility of promoting the conservation of the waters of the State of Colorado in order to secure the greatest utilization of such waters and the utmost prevention of floods, That—

1. It is the position of the State of Colorado that all waters of the Colorado River system available for use in the State of Colorado under the various instruments constituting the law of the river shall be put to beneficial consumptive use in Colorado as expeditiously as orderly economic development will permit.

2. Because of Lee Ferry delivery obligations imposed by the Colorado River compact of 1922, substantial quantities of regulatory holdover storage must be

provided in the upper basin if that basin is to be able to put to beneficial consumptive use its allotted share of Colorado River water.

3. The Colorado River storage project will provide such necessary storage and is essential to the full economic development of the water resources of the upper basin.

4. The plan of the Colorado River storage project to finance the construction of the necessary holdover reservoirs through the revenues derived from the sale of power generated at hydroelectric plants and to utilize a portion of such revenues to assist in the financing of so-called participating projects which meet certain fixed criteria is approved.

5. In connection with the Glen Canyon Reservoir, Colorado directs attention to the fact that this reservoir, which is located but a short distance above Lee Ferry, will yield substantial benefits to the lower basin, one of the most important of which is the detention of silt and the resulting prolongation in the useful life of Lake Mead. The official representatives of Colorado should strive to obtain some recognition by the lower basin of these benefits and, if possible, a sharing by the lower basin of such matters as reservoir losses.

6. The Echo Park unit is a desirable feature which has the full support of Colorado.

7. Authorizing legislation should contain appropriate provisions for the recapture for use within the upper basin of power generated by the Colorado River storage project when and if any of such power is sold or transmitted for use within the lower basin.

8. Specific provision should be made in authorizing legislation to assure that no rights vest in the use of water for power generation in units of the project which will prevent or handicap the beneficial consumptive use upstream of the waters of the Colorado River system to which any upper basin State is entitled.

9. Colorado has no objections to the report of the Secretary of the Interior on participating projects except that Colorado urges that further study be given to the La Plata and San Miguel projects, which are urgently needed, in order to develop, if possible, a feasible plan therefor and except as hereinafter noted.

10. The report and the supplemental report of the Secretary of the Interior practically ignores any development of Colorado River system water in Colorado. For this reason, Colorado cannot accept the report and supplemental report as now submitted. As conditions precedent to Colorado approval of the report, provisions must be made therein, or in the authorizing legislation, which will assure the following water development in Colorado:

(a) The Cross Mountain unit must be included within the initial authorization for construction as of part of the first phase of the project.

(b) There is no doubt that further consumptive use of water in Colorado is directly dependent upon high upstream storage. To provide therefor there must be included in the initial authorization approximately 3 million acre-feet of total new storage on the Colorado River and its tributaries above Grand Junction, Colo., a substantial portion of which shall be located on the upper reaches of the Gunnison River. The known reservoir sites which might accomplish this objective are Curecanti on the Gunnison and DeBeque on the Colorado River. Additional investigations may disclose other sites. There is little doubt but that the stated amount of storage will be needed. The Secretary of the Interior is urged to expedite the investigation and study of projects which will furnish the requested storage.

11. Denver, the capital city of Colorado, desires to divert water from the Blue River, a tributary of the Colorado River, for municipal and industrial uses in the Metropolitan Denver area. The rights of Denver to take and divert such water are alleged to be in conflict with rights for the use of water stored in Green Mountain Reservoir and taken through the Green Mountain powerplant for the generation of power. Green Mountain dam, reservoir, and powerplant constitutes a unit of the Colorado-Big Thompson project of the United States Bureau of Reclamation.

The controversy over the relative rights of Denver and the Green Mountain project are in litigation in a lawsuit now pending in the Supreme Court of the State of Colorado and in another lawsuit now pending in the United States District Court for the District of Colorado.

It would be improper for this board to attempt to invade the province of the courts or to influence the pending litigation. The board has no intention of doing either. The feasibility of the proposed Denver-Blue River diversion depends, among other things, on the outcome of this litigation, or on some alternative thereto which satisfactorily protects the Colorado-Big Thompson project.

Upon the condition that the legal availability of a reasonable quantity of water for the Denver-Blue River diversion be established, either by litigation or some other arrangement, and the condition that such project be otherwise feasible, the board approves the Denver-Blue River project for inclusion as a participating project in the authorization of the Colorado River storage project or for such other Federal legislative or administrative action as may be requested by Denver.

12. The board recommends that Denver and the representatives of the west slope in Colorado make every effort to arrive at a harmonious solution of the unfortunate transmountain diversion controversy which for years has created dissention in Colorado. The board pledges that it and its staff will be ready to assist in the amicable settlement of this prolonged conflict.

13. The director of the board and the Colorado member of the Upper Colorado River Commission are directed to do all things necessary and proper to effectuate this resolution.

14. Copies of this resolution shall be forthwith transmitted to the Governor of Colorado and to the members of the Colorado congressional delegation.

Senator WATKINS. Any questions, Senator Anderson?

Senator ANDERSON. No questions.

Senator WATKINS. I have no questions. Thank you very much for your statement.

Judge Breitenstein will you come forward please?

STATEMENT OF JEAN S. BREITENSTEIN, DENVER, COLO.

Mr. BREITENSTEIN. My name is Jean S. Breitenstein and my address is 2501 Albion Street, Denver.

At the outset, Mr. Chairman, I have one thing which embarrasses me. The young lady who mimeographed my statement put my new title at the head of it. There should be no implication at all that I am testifying here in any official capacity. I am here as a private citizen, on my own time and my own expense.

I might say that after I was confirmed for the office which I now hold, the question arose as to my testifying in support of this legislation. I submitted to the chief judge for the Court of Appeals of the Tenth Circuit the question as to whether or not I should take my oath of office or defer until I appeared before your committee. I secured from him a letter, signed by the Judicial Council of the Court of Appeals of the Tenth Circuit, in which they unanimously say that I should take the oath of office and there would be no impropriety in my appearing here and testifying.

I have a photostatic copy of that letter which I would like to submit for your files so there will be no question raised.

Senator WATKINS. That will be received.

(The letter referred to follows:)

UNITED STATES COURT OF APPEALS, TENTH CIRCUIT,
Denver 1, Colo., June 2, 1954.

JEAN S. BREITENSTEIN, *Denver, Colo.*

DEAR MR. BREITENSTEIN: The Circuit Council of the United States Court of Appeals, Tenth Circuit, composed of the five circuit judges of the circuit, has given consideration to the inquiry in your letter of June 1, 1954, addressed to me as chief judge of the circuit. You asked the circuit council to advise you of its opinion with respect to the propriety of your testifying before the Subcommittee on Irrigation and Reclamation of the Senate Interior and Insular Affairs Committee, relative to a bill now pending for the authorization of the Colorado River storage project, after having qualified as United States district judge for the District of Colorado.

We understand that for many years you have been attorney for the Colorado Water Conservation Board and for the Colorado member of the Upper Colorado River Commission; that you have resigned as attorney for such board and member; that because of your long connection, as attorney for such board and member, with Colorado River Basin problems, you have acquired a knowledge of pertinent matters of fact and law especially qualifying you to give valuable testimony to such subcommittee—testimony with respect to matters peculiarly within your knowledge and not obtainable from any other witness.

We further understand if you do appear before such subcommittee and testify, you will receive no compensation of any kind therefor and will personally pay expenses of travel and maintenance incurred in connection therewith.

We understand no matter of disqualification is involved, because you will be disqualified to sit in matters involving the Colorado River Basin, with respect to which you have acted as counsel in the past.

The council has carefully considered your inquiry and, in the light of what we regard as pertinent facts, it is our considered judgment that you should immediately qualify as United States district judge for the District of Colorado; that you should testify, when requested, before the Subcommittee of the Senate Interior and Insular Affairs Committee, and that there will be no impropriety in your so testifying after you have qualified as United States district judge for the District of Colorado.

Respectfully,

SAM G. BRATTON,
Circuit Judge.
WALTER A. HUXMAN,
Circuit Judge.
ALFRED P. MURRAH,
Circuit Judge.
JOHN C. PICKETT,
Circuit Judge.
ORIE L. PHILLIPS,
Chief Judge.

Senator WATKINS. I might say your reputation in the field of water development is so well known that I think the committee might have considered subpoenaing you if you had not voluntarily appeared. We want to get the benefit of what you know about this upper Colorado River Storage and just because you were put on the bench, do not think you can deprive the committee of having your valuable information on this legislation.

I am sure you have not been in a judicial term long enough to feel that it would be anything which would disqualify you in making your statement.

Mr. BREITENSTEIN. That is right, Mr. Chairman, and I might say just to get into the record the experience I have had, I worked on Colorado River matters with some continuity since 1927.

For many years I was the attorney for the Colorado Water Conservation Board and also I have been the Colorado member of the Upper Colorado River Commission.

Before I go into the prepared statement that I have, I would request that the statements which I gave before the House committee in hearings on H. R. 4449, be made part of the record here. I think I will not read them so there will be no duplication, but if they could be put into the record as they appear at pages 308 to 313, I believe it might be helpful.

Senator WATKINS. Mr. Breitenstein, in view of the fact that the information referred to is already available is the House Hearings. I think it advisable to make the information part of this committee's files rather than to duplicate it here.

Mr. BREITENSTEIN. In the prepared statement that I have, the matter covered by subdivision 2 has been gone into by other witnesses and it would be repetition for me to mention that. Accordingly, I would like to begin on page 3, subdivision 111, that is, that the project is within the spirit and intent of the reclamation laws.

As the project is planned, the principal holdover reservoirs will not store and release water for downstream consumptive uses in the upper basin. Their function rather will be to regulate the streamflows and to generate power. However, the stream regulation, which is so provided, will make possible consumptive use projects for agricultural and municipal purposes which could not exist without the stream regulation provided by the holdover reservoirs.

Senator WATKINS. You have in mind, of course, the use of that water by exchange?

Mr. BREITENSTEIN. That is correct, sir.

The engineers have estimated that under historical streamflow records the available firm water supply for the upper basin is only about 4,200,000 acre-feet annually. The compact apportionments to the upper basin beneficial consumptive use of 7,500,000 acre-feet annually. The difference between the 2 figures, or 3,300,000 acre-feet, represents the quantity of water which will become available for consumptive use in the upper basin by the stream regulation provided by the large reservoirs. The application of this additional 3,300,000 acre-feet of water annually to beneficial consumptive use is beyond doubt a reclamation project.

The generation and sale of hydroelectric power from the units of the storage project is clearly within the Reclamation Act. The April 16, 1906, amendment (34 Stat. 116) to the Reclamation Act of 1902 (32 Stat. 388) shows that Congress contemplated and authorized the development of the power features of reclamation projects. Other amendatory or supplementary legislation shows that throughout the years Congress has authorized, and appropriated funds for the construction of, hydroelectric projects. There are outstanding examples such as Hoover Dam, Parker Dam, and Davis Dam in the lower basin. Section 9 (c) of the Reclamation Project Act of 1939 makes specific reference to the sale or lease of power.

The Colorado River storage project is within the traditional concept of a reclamation project. The primary difference between it and the reclamation project of the past is its size.

In supporting the Colorado River project the upper basin States believe that they are carrying into effect the principle of the regional water development.

Senator WATKINS. May I go back for a moment, Judge?

You said the primary difference between this and other projects in the past was one of size. It is because of the large size that the development has not taken place in the past.

Mr. BREITENSTEIN. That is absolutely correct, Senator, yes. I agree with that.

Senator WATKINS. In other words, if we had gone along piecemeal and gotten an authorization for each project year by year, it would appear to be not as large a project as it now appears.

Mr. BREITENSTEIN. If we had been as fortunate as other areas and developed these small projects in the past, this would not be the size that it is.

Senator WATKINS. And it is the first time, is it not, within your memory, that we have proposed a comprehensive program for a river system?

Mr. BREITENSTEIN. That is correct. This is a comprehensive program for the upper basin.

Senator WATKINS. It shows the development and complete utilization of the water, not only for consumptive uses but also for power and any other uses to which water can be put.

Mr. BREITENSTEIN. Yes, and it is a use which affects four States. Four States have joined in supporting this project.

Senator WATKINS. When I divide it into four, it is not so large, either, is it?

Mr. BREITENSTEIN. That is correct.

Senator WATKINS. I am asking these questions for the benefit of the other Members of the Senate who may not understand that the way we in the West do.

Mr. BREITENSTEIN. Mr. Chairman, next in my statement I have analyzed the two pertinent compacts, the 1922 compact and the 1948 compact. Those have been discussed by others, and if the material appears in the record, I think it would not be necessary to read it at this time.

Senator WATKINS. We will have it all appear in the large type.

Mr. BREITENSTEIN. Thank you.

On page 8, I refer to pending litigation in the lower basin. In August 1952 Arizona brought suit against California and certain public entities of the State concerned with the use of Colorado River water. Later the United States intervened. Nevada has filed a motion for leave to intervene and such motion has been granted. This case, *Arizona v. California* (No. 10 original, 1953 term, Supreme Court of the United States of America), involves controversies of long standing as to the rights of the lower basin States to the use of Colorado River water. The States of Colorado, New Mexico, Utah, and Wyoming are not parties to, or involved in, this lawsuit.

In its complaint Arizona presented three basic issues, viz:

1. How is beneficial consumptive use measured?
2. Is water covered by article III (b) of the 1922 compact apportioned water or unapportioned water?
3. How are reservoir losses from lower basin main stream reservoirs to be charged?

In their answers and other pleading the defendants have asserted a multitude of issues which appear to be immaterial and irrelevant with perhaps two exceptions, which are:

1. Is Arizona a party to and bound by the 1922 compact?
2. If Arizona is a party to the 1922 compact, does it have any rights under, or may it receive any benefits by reason of, the so-called California Self-Limitation Act (act of March 4, 1929; ch. 16, 48th sess.; Statutes and Amendments to the Codes, 1929, pp. 38-39)?

The defendants in this case have requested the Court to appoint a special master to conduct hearings on the controverted issues and to make a report to the Court with recommendations. Arizona opposed this and requested if a special master was appointed, he be limited to the five issues which I have enumerated. However, the Court appointed a master under a general reference. It is not clear at this time whether the master will restrict or limit the hearings in the first

instance. Should he follow such a course, that is, restricting his first consideration to the issues mentioned, then it is possible that the case may be effectively posted within a year or two. On the other hand, it is possible since the reference to the master is general, that it will be necessary to hear evidence on controverted facts and the determination of the case may be indefinitely prolonged.

The pendency of the *Arizona v. California* case has no effect whatsoever upon the authorization of the Colorado River storage project. All parties to that case assert and rely upon the 1922 compact, the Boulder Canyon Project Act, the Mexican Water Treaty, and the other laws and instruments which constitute the recognized and admitted law of the river. Similarly, the authorization of the Colorado River storage project is predicated upon the validity and integrity of the law of the river. While it is true that in the lower basin there has been a prolonged controversy over the application and construction of certain specific terms and provisions, these controversies do not affect the upper States or the availability of water for the Colorado River storage project.

Any insinuation that the authorization of the Colorado River storage project should be delayed until the *Arizona v. California* case is decided is an attempt to defeat upper basin development. There is no legitimate reason for any delay in this project because of the lower basin controversy.

Senator WATKINS. May I ask this question, Judge: Is it not true that there is no responsible decision the Court could make under the issues raised in this case which would make it impossible for the upper basin States to use a large percentage of the waters which are given to them under the 1922 compact?

Mr. BREITENSTEIN. That is correct, Mr. Chairman, and I go into that a little later in the statement.

Senator WATKINS. Then I will not ask you any further questions on that.

Mr. BREITENSTEIN. I would like to interpolate here that if the development in the lower basin had been deferred until there was a settlement of all the controversies down there, you would never have had the Hoover Dam, the All American Canal, Parker Dam, or the Davis Dam or any other of the great developments which they have down there, because while Congress was authorizing and appropriating funds for those projects, there were in existence these controversies which have now come to a head in the present lawsuit. While those projects were under construction, there were three United States Supreme Court lawsuits between Arizona and California. So if their development had to wait until all the controversies were settled, they would not have the projects which they now have.

Senator WATKINS. Of course one of the fundamentals for this project is the water supply. If there is available water supply regardless of the suits and issues involved, there should be no reason for delay.

Mr. BREITENSTEIN. That is correct.

Senator WATKINS. I note reference among the resolution just read to some controversies in Colorado. I am sure the Colorado people would not want this held up until all the controversies in that State have been settled.

Mr. BREITENSTEIN. That is correct.

Senator WATKINS. We do not happen to have any in Utah now, but we do not know when they might break loose.

Mr. BREITENSTEIN. You are fortunate.

Senator WATKINS. I think as we go through these projects, the people are usually able to adjust themselves, and ultimately the controversies will be settled, probably not to the complete satisfaction of everybody, but to the satisfaction of the majority, at least.

Mr. BREITENSTEIN. Yes.

In the next portion of my statement, Senator, I discuss certain legal points which have been raised. In doing this, I am not raising strawmen and knocking them down. Each one of these points has been asserted by people who have testified, either in the House hearings on this project or in hearings on the Fryingpan-Arkansas project. I thought the record should contain at least my answer to these points. The first point, one raised by a Senator earlier this week, is the meaning of per annum in article III of the 1922 compact. It has been urged that the apportionment of the 7,500,000 acre feet of water per annum as made by article III (a) of the 1922 compact means a maximum in any one year and not an average over any period of years. This is a theoretical issue which may some day have to be decided.

Most obviously if the 7½ million is a maximum, the average will be less than that unless there is complete stream regulation. At the moment the assertion of the issue does not even raise a material hypothetical question. The same witness who has raised this point quotes engineering reports as stating that the aggregate consumptive use of the reclamation projects included within the Colorado River storage project is about 1,700,000 acre-feet a year. When this is added to the 2,500,000 acre-feet required by projects already constructed, there will be 4,200,000 acre-feet of water put to consumptive use in the upper basin. See statement of Northcut Ely, hearings on H. R. 4449, H. R. 4443, and H. R. 4463 before the Subcommittee on Irrigation and Reclamation of the House Committee on Interior and Insular Affairs, 83d Congress, 2d session, page 697.

Hence, the upper basin will have to increase its use by 3,300,000 acre-feet before it approaches the figure which is said to be the maximum. The point, if it is worth consideration at all, becomes important only when some other project is up for authorization. It does not and cannot affect the Colorado River storage project.

THE MEASUREMENT OF CONSUMPTIVE USE

The 1922 compact does not define the method of measurement of consumptive use. For a number of years there have been controversies over this point. California has always contended that the measurement is by the "diversions-less-return method." The four upper division States and Arizona have contended that the measurement is in terms of "manmade depletion of main stream virgin flow." In its tendered petition in intervention in the *Arizona v. California* case Nevada has asserted a modification of the mainstream depletion theory.

The upper basin States in the 1948 compact adopted the main stream depletion method unless the administrative agency created by that compact should, by unanimous action, adopt some other method. Hence, so far as the area in which the Colorado River storage project

is located is concerned, the method of measurement is settled. There can be no doubt as to the right of the upper basin States to agree upon a method of measurement which is binding upon them. In this connection it should be pointed out that the California theory of measurement in terms of diversion-less-returns is thoroughly impractical in the upper basin because in that area, instead of there being a very few large diversions such as exist in California, there are literally thousands of diversions. It is utterly unreasonable and impractical to provide automatic measuring devices for all these diversions. Even if the diversions could be measured, no engineer has yet come forward with any reasonable method of determining return flows.

In the statement of Mr. Ely above referred to (House Hearings on H. R. 4449, p. 700) it is asserted that the quantity of water involved in this dispute over the method of measuring "so far as the planning of the upper basin storage project is concerned, is 300,000 to 500,000 acre-feet, according to engineers' estimates." As has previously been pointed out in discussing Mr. Ely's statement, the estimated total consumptive use of water in the upper basin which will result after this project is in operation will amount to about 4,200,000 acre-feet of water annually. If, because of the adoption of a different method of measurement, an additional 500,000 acre-feet must be added to this, the total is still well within the allocation made to the upper basin by the 1922 compact. Hence, the issue is entirely immaterial so far as this project is concerned.

E. RIGHTS WHICH MAY NOW EXIST

The assertion is made that the apportionment made by article III (a) "shall include all water necessary for the supply of any rights which may now exist." The pertinency of this assertion is obscure. The States involved in the Colorado River project recognize fully that the apportionment included rights then existing. This point may possibly have some application in the lower basin controversy, but has no application so far as the Colorado River storage project is concerned.

It should be clearly understood that the 1948 compact gives full recognition to the validity of the 1922 compact. Further in requesting the authorization of the Colorado River storage project the affected States have taken the unequivocal position that the authorization, construction, and operation of the project must be in conformity with the law of the river.

THE MEXICAN BURDEN

Article III (c) of the 1922 compact provides that any right to water recognized in Mexico shall be satisfied first out of surplus over the amounts specified in article III (a) and III (b) and if that is insufficient, then the deficiency shall be borne equally by the two basins and the upper division States are required to deliver at Lees Ferry water to supply one-half of the deficiency. The 1944 Mexican Water Treaty, Treaty Series 944, obligates the United States to deliver to Mexico 1,500,000 acre-feet annually subject to diminution under certain conditions. The adequacy of the water supply to satisfy this

obligation out of surplus has been the subject of prolonged contention for a number of years. At the moment the argument is entirely theoretical because some 8 or 9 million acre-feet of water annually is being discharged by the Colorado River into the Gulf of California. Report of Senate Committee on Foreign Relations, Executive Report No. 2, 79th Congress, 1st session, page 4.

It is conceivable that under conditions of ultimate development there may be an issue as to the responsibilities of the two basins in regard to the satisfaction of the Mexican right. Under existing conditions the issue is entirely hypothetical. As has been mentioned before, the consumptive use of water in the upper division States after the Colorado River storage project is in operation will amount to about 4,200,000 acre-feet. Hence, there is an adequate cushion to supply any potential obligation of the upper division States.

The obligation to deliver water to Mexico may at some future time become pertinent but it has no materiality so far as the authorization of the Colorado River storage project is concerned.

RESERVOIR LOSSES

The 1922 compact makes no provision for the charging of reservoir losses. The method to be applied is one of the issues in the pending *Arizona v. California* case.

So far as the upper basin is concerned, the 1948 compact sets up in its article V a definite procedure for the charging of these reservoir losses. The Colorado River storage project is an upper basin project. The upper basin States have agreed upon how they will charge reservoir losses. They have no concern whatsoever with the unfortunate lower basin controversy on this point. It has no materiality to them or the project which they desire.

Senator ANDERSON. Does it have anything to do with the amount of water the upper basin States can deliver at Lees Ferry?

Mr. BREITENSTEIN. Not in my opinion, Senator. They are obligated under III (d) to deliver 75 million every 10-year period.

Senator ANDERSON. If the evaporation losses were to be charged against that, however, it would make some difference.

Mr. BREITENSTEIN. That is true, Senator. There are people who feel that because the Glen Canyon Reservoir is of tremendous benefit to the lower basin, that the lower basin should share some of the reservoir losses of Glen Canyon. However, I apprehend that it would take voluntary agreement by the lower basin in order to bring that about.

The next is the right to demand or withhold water, article III (e), of the 1922 compact provides that the States of the upper division shall not withhold water and the States of the lower division shall not require the delivery of water which cannot reasonably be applied to the domestic and agricultural uses. This must be considered in connection with article II (h) which defines "domestic use" as including the use of water for certain purposes but specifically excluding the generation of electrical power and with article IV (b) which provides that water may be impounded and used for power generation but such impoundment and use shall be subservient to the use of water for agricultural and domestic purposes which are declared to be dominant.

Under these provisions of the compact water may be withheld by the upper basin and stored in the reservoirs contemplated by the Colorado River storage project so long as the water so stored is not required for domestic and agricultural uses in the lower basin. The mere fact that water so stored can be used for the generation of hydroelectric power in the lower basin does not impose any obligation upon the upper basin to deliver it for that purpose.

Indeed, one significant reason for the authorization and construction of this project at this time is that the immediate construction of the main stream holdover reservoirs will permit them to accumulate water with less interference with uses in both the lower and upper basins than if their construction is delayed until a later date.

In the lower basin the United States has constructed immense dams and powerplants. The United States is interested in securing the production of power and its resulting share of power revenues. By running this water not only through the lower basin plants but also the upper basin generators contemplated by this project, more power will be produced to add to the wealth of our Nation. It is to be presumed that the United States, the upper basin States, and the Upper Colorado River Commission will comply with the compact and will so operate the reservoirs as to attain the greatest possible benefit within the terms of the 1922 compact.

APPROPRIATION OF SURPLUS

Another question which has been raised is whether or not article III (f) of the 1922 compact intends that no State may validly appropriate surplus water until a new compact is made for the allocation of surplus. The pertinency of this point is beclouded. Except for California, there has been general agreement among the Colorado River Basin States that no firm right to any surplus waters may be obtained until there is an allocation after October 1, 1963. The position of California has been that a right to use a portion of such surplus may be obtained subject to possible divestment after October 1, 1963. It has never been explained how the validity or invalidity of either position has any bearing upon the authorization of the Colorado River storage project.

IMPOUNDMENT OF WATER FOR POWER GENERATION

As has heretofore been mentioned, article IV (b) of the 1922 compact makes the impoundment and use of water for power generation subservient to agricultural and domestic uses. This is recognized by the upper basin States who do not deny that the project is squarely controlled by the 1922 compact. This provision, however, does not affect the feasibility of the Colorado River storage project. Water needed for agricultural and domestic purposes in the lower basin must be passed downstream to the full extent of the apportionment made to the lower basin by article III (a) of the compact and in accordance with the delivery obligation contained in article III (d) of the compact.

Public officials are presumed to do their duties. Sovereigns, such as the United States, and quasi-sovereigns, such as the States, are presumed to comply with the law. It is not reasonable to object to the

Colorado River storage project upon the ground that in the future the persons in official control of the reservoirs will violate the law of the river.

INDIAN RIGHTS

The 1922 compact provides in its article VII that nothing therein shall be construed as affecting the obligations of the United States to Indian tribes. Article VII of the upper basin compact of 1948 requires that uses of water by the United States and its wards shall be charged as a use by the State in which the use is made.

It is true that in the pending suit of *Arizona v. California* there is an issue as to the method of charging Indian uses of water. This does not concern the upper basin. The omission in the 1922 compact of any provision for the charging of uses of water by the United States or its wards has been supplied so far as the upper basin is concerned, by the 1948 compact.

A California spokesman in the House hearings on this project has stated that the Bureau of Indian Affairs has construed the compact as meaning that the Indian claims in effect are prior and constitute the first demand upon the water supply. If such a theory should be upheld, then every right to the use of water of the Colorado River and its tributaries is of doubtful validity. It is inconceivable that the United States as the guardian of the Indians will ever assert that the rights of the Indians come ahead of the use of water on the great reclamation projects which the United States has constructed on the Colorado River such as Hoover Dam, the All-American Canal, the Salt River project, the Gila project, the Colorado-Big Thompson project, and many others.

Senator ANDERSON. Did the California spokesman give his authority for that statement?

Mr. BREITENSTEIN. He did not. However, I may say from conferences which I have had with representatives of the Bureau of Indian Affairs, that is the position which they have taken in statements to me.

Senator ANDERSON. They have construed the Winter's case pretty liberally with respect to that?

Mr. BREITENSTEIN. Yes; they rely on the Winter's case, Senator.

And adjudication of the Indian rights in the Colorado River Basin would require a consideration of every right to the use of the waters of the Colorado River and its tributaries in each of the seven basin States. Such procedure would cost millions of dollars and require years of time. It should be mentioned in passing that there are Indian reservoirs on many other streams. There is nothing unique about the Colorado River. If the Indians have a prior right to the use of the water of all of our streams, then indeed the Nation is in a most grievous condition.

In this regard it should be pointed out that the upper basin States have always had a deep concern over the welfare of the Indians. The apportionment to New Mexico, as made in the 1948 compact, was substantially increased because of a recognition of the Indian rights. The upper basin States desire to have the lot of the Indians improved by the construction of water use projects which are reasonably adapted to serve the Indian needs. In connection with the investigation of the

Colorado River storage project much consideration has been given to the Shiprock project in New Mexico. It is to be hoped that these studies will soon be completed and a project report submitted to the Congress so that the Indians may benefit therefrom. It should be understood that the upper basin States wish to help the Indians. At the same time they protest against any delay in the authorization of the Colorado River storage project by reason of the assertion of fantastic, unrealistic, and groundless claims of Indian rights.

PRESENT PERFECTED RIGHTS

California has asserted that the word "unimpaired" as used in article VIII of the 1922 compact means unimpaired as to both quantity and quality. California then suggests that the upper basin development will cause the quality of water delivered at Lee Ferry to deteriorate and, hence, constitute a violation of the compact. This is a denial of the validity of the apportionment made by article III (a) of the 1922 compact, because, if the California theory is correct, any impairment in quality would render the use of the water apportioned to the upper basin impossible. Such was never the intent of those who drafted the 1922 compact. Nowhere in that compact is any reference made to quality of water.

The statements of California witnesses are based upon no engineering studies supporting the theory that the quality of water will be impaired by upstream development. The assertions are based upon speculation and conjecture and constitute but another example of the extreme positions asserted to prevent and embarrass an upper basin development.

It is an elementary principle of the construction of statutes, treaties, and compacts that a document must be taken and considered as a whole. When the Colorado River compact of 1922 is so taken and considered, the conclusion will be inevitably reached that article III (a) is effective as to the apportionment of water and may not be destroyed by the legalistic and unwarranted insertion in article VIII of the compact after the word "unimpaired" the phrase "either in quantity or in quality."

California spokesmen, in discussing this subject, make reference to proposed transmountain diversions of water in the upper basin. Here again the 1922 compact is explicit. The definitions of the basins as stated in article II (f) and article III (g) clearly contemplate the transmountain diversion of water because they include within those basins all parts of the mentioned States without the drainage area which "are now, or shall hereafter be, beneficially served by waters diverted from the system."

It is, of course, well known that the California uses in the Imperial Valley, the Los Angeles area, and the San Diego area are all transmountain diversions.

It is respectfully submitted that the upper basin States have the right to make use of their apportioned share of the water at any place within such States, provided only that the Lee Ferry delivery obligations are maintained.

Suggested amendments:

PRELIMINARY AMENDMENTS

In the hearings before the House Committee on the Colorado River storage project bill, Mr. Ely, attorney for California, suggested certain amendments. These will be grouped for discussion.

PROPOSED AMENDMENTS PERTAINING TO THE LAW OF THE RIVER

The upper basin States recognize that the Colorado River project must be authorized, constructed, operated, and maintained in accordance with the law of the river. Further, any uses of water under any units of the project must conform to the law of the river. It is desirable to have this made clear in the bill but undue and unnecessary repetition should be avoided.

In this same regard the upper basin States recognize that there is the pending lawsuit involving uses of the Colorado River water in the lower basin. It is not the intent of the upper basin States, in urging the authorization of the Colorado River storage project, to influence the course of that litigation.

If amendments are thought necessary on these points, then the language employed in section 7 (a), (b), and (d) of the May 6, 1954, committee print on S. 964 to authorize the Fryingspan-Arkansas project is acceptable and adequate.

TRANSMOUNTAIN DIVERSIONS

Amendment No. 3 offered by Mr. Ely relates to transmountain diversion—see hearings on H. R. 4449, *supra*, pages 706, 707. This amendment requires that all Colorado River system water exported out of the natural basin of that system must be consumptively used in a Colorado River Basin State. In support of this proposal Mr. Ely merely stated that there is not enough water to enable the eastern slope of Colorado to compose its differences with Nebraska and Kansas.

Colorado has already composed its differences with both Nebraska and Kansas. On the North Platte River there is a Supreme Court decree (325 U. S. 589, 665). On the South Platte there is an interstate compact with Nebraska (44 Stat. 195). On the Republican there is a compact with Nebraska and Kansas (57 Stat. 86). On the Arkansas there is a compact with Kansas (81st Cong., 1st sess., ch. 155, Public Law 82). Hence, there is no reason for Colorado to have any desire whatsoever to pass any Colorado River water out of its borders. Indeed, the need for water in Colorado is so serious that it is inconceivable that Colorado would voluntarily permit any of its apportioned water exported from the Colorado River Basin to be used anywhere except in Colorado.

Be that as it may, the position taken by Mr. Ely does not accord with the Colorado River compact and does not accord with the uses of Colorado River water made in California. There is nothing in the Colorado River compact of 1922 which requires that water taken out of the natural basin must be consumptively used in a Colorado River Basin State. From a practical standpoint it would be impossible to give an assurance that Colorado River water would not pass out of the borders of a Colorado River Basin State. This results from the fact that Colorado River water is commingled with natural basin water and cannot be identified after such commingling.

Under the existing court decree and interstate compacts, Colorado is under no obligation to pass any imported water to any downstream State—for example, North Platte decree, article XII (c), 325 United States 671; South Platte compact, article IV, Arkansas River compact, article III B and article IV A.

If the theory for which Mr. Ely contends is the law, then the State of California is required to use consumptively all the water diverted from the Colorado River system for use in the Los Angeles and San Diego areas, because if it is not so used but discharged into the Pacific Ocean, there will be a compact violation. This situation in and of itself shows the fallacy of the contention.

If it is determined that some protective amendment should cover this point, then section 7 (c) of the committee print of S. 964, above referred to, is satisfactory.

SALINITY

Mr. Ely's amendment No. 4 relates to studies of salinity. The question of quality of water has heretofore been discussed. If the Congress wishes to authorize the Secretary of the Interior to make salinity studies, the upper States have no objections. But there is no reason whatsoever for an amendment to a bill for the authorization of the Colorado River storage project requiring salinity investigations. If this is to be done at all, it should be done under a general authorization applying to all western streams; and, so far as the Colorado River is concerned, it should apply to the upper basin as well as the lower basin.

The next subject is: Operation of reservoirs.

Senator ANDERSON. Where is most of the water being diverted from now?

Mr. BREITENSTEIN. The lower basin.

Senator ANDERSON. If this is to apply, surely we ought to go back and start testing that first.

Mr. BREITENSTEIN. I should think so, yes.

Senator ANDERSON. The point of the greatest use is the point of the greatest benefit to the greatest number of people. The Republic of Mexico might object to the use of this water by the State of California, for example.

Mr. BREITENSTEIN. That is right, sir.

The next refers to operation of reservoirs.

Amendment No. 5 proposed by Mr. Ely authorizes the creation of an "integrating committee" to advise with the Secretary of the Interior on the storage in, and release of water from, main stream upper basin reservoirs. The first obvious thought is that if such an integrating committee is to be created, then it should have control over not only the upper basin reservoirs, but also the lower basin reservoirs.

As has heretofore been pointed out, the officers of the United States and the States are presumed to do their duty. If in the performance of any ministerial act they violate the law of the river, they may be held to account in a proper legal manner.

It may be eventually desirable to have some such committee as has been suggested, but when and if that time arises, its responsibility should encompass both basins and not just the upper basin. Moreover, if it is to be created, it should be brought into existence by a statute designed for that purpose and not an amendment to a bill

for the authorization of an upper basin storage project. In other words, if you have a committee of that kind at all, it should be a general committee applying to every project on the entire stream, and not a selected group of projects.

Senator ANDERSON. Why not have that on the Columbia River as well?

Mr. BREITENSTEIN. If it is desirable at all, you might have a committee on the Columbia, Missouri, Sacramento, and so on, over the western part of the United States.

Senator WATKINS. As you have suggested, the time may arrive when we may have to have some water masters on the river.

Mr. BREITENSTEIN. That may eventually be necessary.

Senator WATKINS. It may be done by creation of a committee or by naming a water commission, but that has nothing to do with this bill at the present time.

Mr. BREITENSTEIN. No, sir; not in my opinion.

The next topic relates to waiver of immunity to suit.

Mr. Ely also suggests in his proposed amendment No. 5 that the United States give consent to suit in the event of the failure of the Secretary of the Interior to comply with the law of the river. This request assumes improperly that the Secretary of the Interior will not comply.

If the United States is to grant any general waiver of immunity to suit in matters affecting the Colorado River Basin, it should be done by a statute especially intended for that purpose. It should not be done in legislation to authorize the Colorado River storage project.

I would like to add, if you do it at all, it should be by such general legislation that it will apply to both basins.

Senator KUCHEL. Would you mind developing the reasons a little bit, Judge?

Mr. BREITENSTEIN. Because, Senator, if you do that, it should be of general application. We have here a project for the upper basin of the river. In the first place, I think any consent by the Congress to suit should be in a bill by itself, so that particular consideration may be given to that one point.

Second, I say that if you are going to waive immunity to suit, consent to suit, then it should be as to matters affecting the entire stream, and not just the upper basin.

It is conceivable, Senator, that we in the upper basin might want to sue you folks in the lower basin. Why should you have a preference over us here?

Senator KUCHEL. My only point is, assuming an amendment were drafted in keeping with the suggestion that you just made, could it not legally and in parliamentary fashion be attached to this vehicle?

Mr. BREITENSTEIN. It could, if it was thought necessary. I think you will have better consideration of that point if it is in specific legislation.

As you no doubt remember, several years ago there were prolonged hearings, both on the Senate and the House side, on proposed legislation granting immunity to suit in Colorado River matters. None of those bills ever passed, but there were hearings which went on for weeks on that one specific point.

Senator ANDERSON. Judge, when we were struggling with the central Arizona bill, which authorized dams down below the Grand

Canyon, Bridge Canyon, and others, a great deal of attention was given to the question of the right of the Government to be sued in this Colorado River matter. It seems to me—and I am sure you remember a lot better than I—it seems to me the State of California proposed at that time, as a compromise, that the central Arizona project be passed, but that before it was to be operative or effective there had to be this suit entered into and tried in the courts of the country. It was a general provision for that.

Mr. BREITENSTEIN. That is correct, yes.

The next material that I have here, beginning at the bottom of page 28, refers specifically to Colorado.

Senator WATKINS. May I ask you about another matter for a moment. I notice in the waiver of immunity to sue, that if it is as general as you have stated it there, the right to sue the Secretary of the Interior to compel the enforcement of the law of the river might be a very effective way to stop this project. One can say the Secretary is violating the law of the river in doing this or that, and a suit could be brought and an injunction sought. That would end progress on the river until that suit was disposed of.

Mr. BREITENSTEIN. That is right. There is another point I would like to make there. I am not trying to express any judicial opinions here, but in my opinion, if the Secretary of the Interior or any of those under him, in constructing or operating this project, violated the law of the river, I think that they could be stopped, and the question of waiver of immunity by the United States would be immaterial to that suit.

Senator KUCHEL. You think they could be what, Judge? I did not hear you.

Mr. BREITENSTEIN. Could be restrained from violating the law of the river.

Senator KUCHEL. By judicial process?

Mr. BREITENSTEIN. Yes.

Senator KUCHEL. In the absence of an immunity provision in the statute?

Mr. BREITENSTEIN. Yes; because when they violate the law of the river, they would not have about them the cloak of protection which the United States has. When an officer violates a ministerial duty, he can be called to task for that, Senator, and there is no question of suit against the State.

Senator KUCHEL. Your point would be, then, that you would urge there is no necessity for an immunity provision to be added to this bill to compel the Secretary of the Interior to comply with the law of the river, because you would urge that that right would be available even in the absence of an immunity provision.

Mr. BREITENSTEIN. That is my opinion, sir, because of the nature of this project and the nature of the responsibilities, duties, and obligations of the Secretary of the Interior in regard to it. You do not have the same situation here that you had in the lower basin. That related to the right to the use of the water, the availability of water. That is a different situation, in my opinion, than would arise in the operation of this project.

Senator WATKINS. As a matter of fact, frequent suits are filed against Federal officials here in the District of Columbia to compel them to do their duty.

Mr. BREITENSTEIN. That is correct.

Senator KUCHEL. So, in a word, your objection to this specific proposal of Mr. Ely's is that it would be surplusage?

Mr. BREITENSTEIN. In my opinion, it would, yes. If the Secretary violates the law of the river, I apprehend that your State or mine or any other could sue him and compel him to comply with the law of the river.

Senator KUCHEL. The only thing that occurred to me, if the position you take is correct and it would be merely surplusage to add it, then I can see no violent objection to it if it would not otherwise impair the legislation.

Senator ANDERSON. If it would not otherwise impair the legislation, yes, but that is the very point.

Senator KUCHEL. The judge has not suggested that it would otherwise impair the legislation, Senator. I do not think he has.

Mr. BREITENSTEIN. The difficulty, Senator, is that it is an encouragement to litigation. We in the upper basin do not like litigation. Colorado has had more unfortunate experiences with water litigation than any other State. I have participated in some.

For example, the Arkansas River was in Federal court litigation from 1901 until 1943; the Laramie River from 1913 to 1940; the North Platte from 1934 to 1945. We in the upper basin try and settle our problems—and we have had a lot of them—without going to court, because of the length of time and the troubles you get into. It is better to do it across the table than it is in court, in my humble judgment.

I would like now, if I may, to pass to the top of page 31. The other material in there will be covered by other witnesses from Colorado. So, if I may, I will turn to the top of page 31.

The subject there is: Curtailment of USE.

Article IV of the 1948 compact provides for the curtailment of use to satisfy the delivery obligation imposed by article III (d) of the 1922 compact. The State of Colorado is bound by this provision and it is to be presumed that it will comply therewith. However, there appears to be some misunderstanding as to the application of this provision and the provisions of article III (a) of the 1948 compact. In his testimony before the House committee on H. R. 4449, Mr. Raymond Matthew stated, at page 691, that the upper basin States should be required to set up priorities for existing and potential projects such as has been done in California. While he has not enlarged upon this, his idea evidently is that this must be done in order to fix responsibility in the event any curtailment of use ever becomes necessary. So far as Colorado is concerned, the answer is that Colorado now has, and at least ever since the adoption of its constitution has had, the priority system whereby each and every decreed water use is given a priority number and in times of curtailment the uses are shut down in the inverse order of their priority.

Certain of the testimony presented in the House hearings is based upon the theory that the percentage apportionment of use made to Colorado by the 1948 compact applies not to the Colorado River system as a whole in Colorado, but as to each tributary. The idea is that Colorado can use but 51.75 percent of the water of each tributary. There is nothing in the 1948 compact which even hints at such a principle. The allocation to Colorado is 51.75 percent of—

the total quantity of consumptive use per annum apportioned in perpetuity to and available for use each year by the upper basin under the Colorado River compact.

This is a general and not a specific apportionment. There is nothing in the Colorado River compact of 1922 which in any way limits the amount of water that Colorado and its water users may take and divert from any tributary. The apportionment is a percentage of all available water. In the upper basin compact of 1948, certain conditions are placed on Colorado so far as the use of water from the San Juan and Yampa River is concerned. These conditions are in no way related to the apportionment percentage of Colorado.

That concludes my statement, and I am grateful for your giving me the opportunity to appear here.

Senator WATKINS. Do you have any questions?

Senator ANDERSON. I think we should be grateful to you, Judge, for coming here and giving us the benefit of your long experience in this matter.

Mr. BREITENSTEIN. Thank you.

Senator WATKINS. Senator Kuchel?

Senator KUCHEL. Judge, I am a new Member of the Senate. I come from California. The representatives of the State of California have been apprehensive that there might be in the legislation something which would effectively violate the 1922 Colorado River compact, and to that extent would interfere with the legal rights of California under that compact.

I would like, if I may, by a few questions to inquire and get a little background so far as your thinking is concerned, as a lawyer and as a distinguished judge.

I was most interested in your statement. First of all, on page 20 where you discuss Indian rights, and then over on page 21 you suggested that a California spokesman in the House hearings on the project stated that the Office of Indian Affairs has construed the compact—that is, the 1922 compact—as meaning that the Indian claims in effect are prior and constitute the first demand upon the water supply.

Senator Anderson asked a question or two at that point relative to the authority with which the California spokesman made that statement.

Did I understand you, Judge, to say that the statement is based on the Office of Indian Affairs taking that very position?

Mr. BREITENSTEIN. That is correct, sir. I may say that California attorneys have just as vigorously opposed that theory as have those representing the upper basin States.

Senator KUCHEL. I see. So we have the situation where one of the agencies of the Department of the Interior has in effect ruled that Indian claims constitute a first—I was almost going to use the word "paramount"—a first right with respect to the waters of the river.

Mr. BREITENSTEIN. They have made that claim; yes, sir.

Senator KUCHEL. Has that ruling been acceded to by the Secretary of the Interior? Has it been applied by the Department of the Interior?

Mr. BREITENSTEIN. That is a controversial subject, Senator. So far as I know, the present Secretary of the Interior has never agreed to it, nor has the Department of Justice.

Senator KUCHEL. Meanwhile, however, it still is the basis on which the Office of Indian Affairs has conducted its business?

Mr. BREITENSTEIN. It has repeatedly made that assertion. There is no doubt of that.

Senator KUCHEL. If that decision in favor of Indian claims priority were to continue, would that have any effect upon the bill before us if it were adopted and enacted into law?

Mr. BREITENSTEIN. It might have a very grievous effect, sir, but if it is so adopted, it would not only affect the Colorado River—it would affect the Sacramento River, Columbia River, Snake River, Yellowstone River—all the western streams where there were any Indians at all.

Senator KUCHEL. So would it not be proper for this committee to hear from a representative of the Department with respect to a ruling of one of its offices, and have the matter clearly brought before the committee, either indicating that the Department would continue to abide by that decision on the part of its Office of Indian Affairs, or that it now repudiates it and changes it?

Mr. BREITENSTEIN. That is a matter of policy for the committee, Senator.

Senator KUCHEL. At least it would be your statement that the present construction of the compact which the Office of Indian Affairs has made would have a marked and, I think you said, grievous effect on the legislation?

Mr. BREITENSTEIN. It would also affect the operation of the Hoover Dam, the Metropolitan Aqueduct, the All-American Canal, and all of them.

Senator ANDERSON. There are as many Indians along the Colorado River as there are in the State of California.

Mr. BREITENSTEIN. Yes, there are Indians in every Colorado River Basin State except Wyoming. Wyoming does not have any. All the rest of us do.

Senator WATKINS. As a matter of fact, we are not having any arguments with the Indians respecting this project. They are in favor of it just as we non-Indians are.

Mr. BREITENSTEIN. That is correct, sir. And may I point out, as I did before Senator Kuchel came in, that in the upper basin compact, we took care of all that. We have specific provisions in the upper basin compact that all uses of water by the United States or its wards are chargeable to the State in which they occur. As I said then, the other States increased the allotment to New Mexico in order to take care of the Shiprock project.

Senator ANDERSON. And did not the people participating in that conference steadily represent the desire to have a large supply of water devoted to the Navaho Indians?

Mr. BREITENSTEIN. May I say, Senator, they did that very vigorously.

Senator WATKINS. As a matter of fact, the United States has already adopted a policy, in authorizing projects downstream, of not letting any so-called Indian rights affect, in any way, the policy of building these projects.

Mr. BREITENSTEIN. That is correct. You have the reservations below Hoover Dam on the Colorado River.

Senator KUCHEL. Then we have a case here of the right hand not knowing what the left hand is doing, because—and I am trying only to develop the facts here—if the Office of Indian Affairs ruled one way and the Government of the United States on occasion ruled otherwise, then we have diametrically opposite decisions by the Federal Government with respect to prior rights of Indians on waters.

Mr. BREITENSTEIN. That is correct, sir, and that is involved in the pending Rio Grande lawsuit between Texas and New Mexico.

Senator KUCHEL. It does point up one of the problems that ought to be solved, at least administratively and perhaps subsequently judicially.

Mr. BREITENSTEIN. I don't disagree with that at all, sir. I do want to emphasize that the upper basin States have shown a concern over the Indians. It is our desire to help the Indians.

Senator KUCHEL. I think I quote correctly one of the able witnesses who testified yesterday or the day before, when I say that in the law of water, and particularly when there are exchanges of water, the exchanges must constitute an exchange of water not alone alike in quantity, but also in quality.

If that is true, I would like to refer to your testimony on page 23, where you say that the statements of California witnesses are based upon no engineering theory that the quality of the water will be impaired by upstream development.

Mr. BREITENSTEIN. Yes.

Senator KUCHEL. Would it be correct, Judge, for me to state your position to be that, while there is a responsibility of delivering on any exchanges water of equal quantity and quality, it is your position that the people from California have not successfully urged that there would be a lack of quality in any exchange?

Mr. BREITENSTEIN. That is partly it; and, Senator, I should say first, with all due regard to George Clyde—and I have the utmost respect for him—I heard him make that statement yesterday, and I frankly disagree with the part on quality of water. In Colorado on the eastern plains there are exchanges of water every year—it is a practice of long standing—where I am sure there is different quality in the exchange. But it is usable water. The ultimate question is whether or not the water is usable.

Senator KUCHEL. And by usable, you mean from the chemical standpoint, capable of being used for the various consumptive purposes that the compact would require?

Mr. BREITENSTEIN. For the purpose intended; yes.

On the other matter that you raised, Senator—

Senator KUCHEL. May I pursue that a moment.

Mr. BREITENSTEIN. Surely.

Senator KUCHEL. With respect to usability, can you state to the committee who would determine the quality of exchanged water under this legislation?

Mr. BREITENSTEIN. Sir, I don't think that under the legislation here there would be any necessity of determining the quality of water, because it seems to me that, if anything, the quality—I am speaking as a layman, please understand me—will be improved. So far as exchanges in Colorado are concerned—they have been going on on the

eastern plains for years—I have never yet heard the question of quality of water raised.

I might say, Senator, that when you get into quality of water, the quality of water on such streams as the Pecos, the Rio Grande, the Arkansas, and part of the south Platte, is much less than that of the Colorado. Yet that water is being used and has been used for years for irrigation and municipal purposes.

Senator KUCHEL. I suppose the question of the quality of water or usability of water is a matter of judgment.

Mr. BREITENSTEIN. It is to a great extent.

Senator KUCHEL. There was some testimony in the House of Representatives in the hearing on the bill which would indicate that under this legislation the quality of water would be affected. I suppose if that testimony were correct, the question of proper quality or usability again would be a question of judgment. Reasonable people might disagree.

Mr. BREITENSTEIN. That is correct.

Senator KUCHEL. Again I ask, suppose under this legislation, and in good faith, the contention were made that the quality of water delivered at Lee's Ferry after the present legislation were adopted into law was not usable. Who would sit in judgment as between the different opinions?

Mr. BREITENSTEIN. Senator, if that should come about, I apprehend that the final decision would be by the Supreme Court of the United States on the basis of the conflicting claims of the parties.

Senator KUCHEL. How would the Supreme Court of the United States have jurisdiction to decide that question?

Mr. BREITENSTEIN. I apprehend that some lower basin State or States would sue the upper basin State or States and claim that there was a violation of the compact because the water delivered at Lee's Ferry is inferior in quality.

Senator KUCHEL. Would the Supreme Court gain jurisdiction of that merely by the filing of the suit in the Supreme Court by one State against another?

Mr. BREITENSTEIN. Yes. The Court has original jurisdiction of such suits.

Senator KUCHEL. Would the Department of the Interior have the responsibility of determining whether or not the quality of the exchange water was the same?

Mr. BREITENSTEIN. Frankly, Senator, I doubt whether or not the Secretary of the Interior would. There is nothing in the 1922 compact which relates to the quality of water. If there is a violation of that compact, the violation, in my judgment, would occur by a State because of our existing system of apportionment and allocation of water in the West. If it would be contended by a State that another State, or States is violating the law in any way, the United States Supreme Court would have jurisdiction to determine that issue.

Senator KUCHEL. Is it your testimony, then, that the bill in its present wording does not clothe the Secretary of the Interior with the responsibility of administering the projects provided for in this bill as to the determination of quality and quantity of water?

Mr. BREITENSTEIN. As to quantity, I think the bill does give him that power, because it gives him the power to operate these reservoirs.

Senator KUCHEL. As to quality?

Mr. BREITENSTEIN. Quantity.

Senator KUCHEL. But not as to quality?

Mr. BREITENSTEIN. No, sir.

Senator KUCHEL. So if there ever were a question, as respects the delivery below Lee's Ferry, as to the quality of the water, it would be your statement that under the bill those who contended they were aggrieved would have to look to the specific State——

Mr. BREITENSTEIN. State or States; yes.

Senator KUCHEL. Or States to satisfy their grievance?

Mr. BREITENSTEIN. Yes, Senator, because the rights would be those alleged to exist under the 1922 compact. That compact has been signed by the States. I apprehend if that situation ever developed one State would say that another State has violated the compact. That is the way it would arise. And the Court would take, I assume, original jurisdiction of the case.

Senator KUCHEL. And no action by the Congress would be necessary to approve the jurisdiction?

Mr. BREITENSTEIN. Not in my opinion, sir.

Senator WATKINS. Would it be proper for Congress to take away the right of any State to sue another State?

Mr. BREITENSTEIN. I think it has been held that Congress cannot do that, Senator.

Senator WATKINS. That is right.

Senator KUCHEL. On page 24, in discussing the recommendations which Mr. Ely made to the House committee, you describe his amendments under numeral 2, "Proposed amendments pertaining to the law of the river," and you find yourself in agreement with the first suggestion he made.

Mr. BREITENSTEIN. Oh, yes. We say here, Senator, that this project must be authorized, constructed, and operated under the law of the river. We are relying on that just as much as the lower basin is.

Senator, in that regard, I do not know whether you have seen it or not, but there have been suggested amendments to the bill to authorize the Fryingpan-Arkansas project, that is, S. 964.

Senator KUCHEL. I was going to ask you, do you have that language?

Mr. BREITENSTEIN. Yes, I have it here.

Senator KUCHEL. Could it be made a part of the record, Mr. Chairman? That would be in connection with the Judge's recommendations.

Senator WATKINS. We will receive it as a part of your testimony. Will you identify it?

Mr. BREITENSTEIN. I have it copied on a piece of paper here. These are taken from the committee print on S. 964.

Senator WATKINS. If you will make a notation that you offered it as a part of your testimony.

Senator KUCHEL. On S. 964.

Senator ANDERSON. Could we not ask Mr. Nelson to put into the record at this point the suggested amendments to the Fryingpan-Arkansas bill, and we will have them all in the record at this point.

Senator WATKINS. Since he has it already, let us do it this way.

Mr. BREITENSTEIN. These cover the points Mr. Ely was testifying to and, so far as I am concerned, I have no objection to them. They

do not go into the waiver of immunity to suit, but they do go into the law of the river and matters like that.

If the committee saw fit to put similar provisions in this bill, so far as Colorado is concerned I am sure it would have no objection.

(The document referred to follows:)

SEC. 7. (a) The use of water diverted from the Colorado River to the Arkansas River 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), as hereinbefore provided, and shall be included within and shall in no way increase the total quantity of water to the use of which the State of Colorado 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 contractors of the United States and of the State of Colorado 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 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 basis of that system by means of works constructed under authority of this Act, or extensions and enlargements of such works, to the Arkansas River Basin for consumptive use outside of the State of Colorado, 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, as far as the same is controllable through the operation of works herein or hereafter authorized, by use of return flow.

(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 the 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.

Senator ANDERSON. The Fryngpan-Arkansas project is a diversion of water from one water slope to another, is it not?

Mr. BREITENSTEIN. Yes, sir, it is a transmountain diversion of water from a tributary of the Colorado River to the headwaters of the Arkansas River, in Colorado.

Senator ANDERSON. With the greatest use being domestic in this case.

Mr. BREITENSTEIN. That is correct, yes, sir.

Senator ANDERSON. The provision of a water supply for a great city like Colorado Springs, and so forth—

Mr. BREITENSTEIN. Pueblo, and other cities.

Senator ANDERSON. Is regarded as a very proper use of that water if the State of Colorado wants to do it that way.

Mr. BREITENSTEIN. That is right.

Senator KUCHEL. In your testimony on page 27 with respect to salinity and the recommendation made about salinity, you state you have no objection to Congress authorizing the Secretary of the In-

terior to make salinity studies, but that if it were done at all, it should be under a general authorization applying to all western streams.

Mr. BREITENSTEIN. Yes.

Senator KUCHEL. Since here we deal with a contractual arrangement by which a number of States have entered into an agreement on the waters of the Colorado River, what would your objection be if an amendment were suggested requiring studies of salinity merely as a part of this project?

Mr. BREITENSTEIN. Senator, I personally would have no objection to that if the authorization was general all the way up and down the stream from the headwaters clear down to the Gulf of California. However, if there is to be such a salinity investigation, it should be under general legislation applying to all the western streams.

Senator WATKINS. As a matter of fact, Judge, the Geological Survey is now authorized to make that study.

Mr. BREITENSTEIN. It makes some studies, Senator. I think those might well be broadened to include streams in areas which are not now included.

Senator WATKINS. I understood from one of the previous witnesses that such a study was being made out in Colorado.

Mr. BREITENSTEIN. I understand that salinity studies have been made on the Colorado by the USGS for some time. I don't know how long they have been made.

Senator KUCHEL. My only point is that if the question of professional studies on the salinity of the water in this river were deemed to be important, it seems to me it would be easier to discuss the possibility of amending this legislation with respect to studies of salinity on the water covered by this bill rather than by urging in a separate piece of legislation that that study be extended to waters in all rivers.

Mr. BREITENSTEIN. That may be true, Senator, but certainly as a minimum it should include the entire length of the Colorado River system. You will recall the testimony of Mr. Clyde yesterday, that during the period before the regulation of the stream by Boulder Dam, the quality of water at Yuma, Ariz., at times of low flow was much worse than it is now with regulation.

Senator ANDERSON. It is your testimony that this means a concentration of solids of about seventy-eight one hundredths ton per acre-foot, and might rise as high as eighty-eight one hundredths of a ton. I have never had any expert advise that I should not put water on my land that had eighty-eight one hundredths of a ton in it. As a matter of fact, we have not had any water now for 10 or 12 days.

The Pecos River is dry. Rivers are dry that have never been dry before. We would like to get water that went as far as permissive drainage, which is two full tons per acre-foot.

I do think if we are going to have some studies, I would like to know what eighty-eight one hundredths does to your soil if it is, as Mr. Clyde pointed out, regularly flowing on and not just flushing it out at one time and then leaving it very dry at another. It seems to me in the hearings on the central Arizona project, the discussion with reference to the Gila River pretty clearly brought out the difference between a well-regulated river and one that is dry and then has flood periods.

Mr. BREITENSTEIN. That was gone into quite thoroughly in those hearings, as I recall.

Senator KUCHEL. Senator Anderson, may I ask if you would like to know what effect that amount of salinity or liquid solids, as you suggest, would have on your land, would you like to know sufficiently to consider an amendment in this legislation to provide the technical and professional facilities?

Senator ANDERSON. We have had many discussions of the Winters case. As a layman, I have many times asked my legal friends if one of them sometime would sit down and tell me in pretty simple language what the implications of the Winters case are and what was decided by the Winters case, so that I might know more about it than the Bureau of Indian Affairs seems to know, I will put it that way. But at least I would like to know in general what the Winters case means as applied to all rivers in the United States, and not just to the Colorado.

By the same token, I would like to know what salinity means and what these solids mean across the country, not only as far as the upper Colorado River is concerned, but what the lower basin is doing to the poor Republic of Mexico, which stands by and has no defense because it may be getting some awful water. I do not think it is. I think water is pretty good if you can have it for irrigation even if it has salinity up to ninety-nine one-hundredths of a ton per acre-foot.

Senator KUCHEL. Senator, are you suggesting that the Republic of Mexico has made any representations that its receipt of Colorado River water is not of the quality—

Senator WATKINS. Gentlemen—

Senator ANDERSON. No. It is delighted to get hold of some water.

Senator WATKINS. We are not going to settle any arguments affecting Mexico here. I would like to suggest that since one of the United States agencies which is studying water problems is already making that investigation, and apparently has authority to do it or it would not be doing it, that any amendment of that kind here would be absolutely unnecessary. If a problem arises the United States Geodetic Survey can take care of it. It would be better for them to do it, anyway, than to have the Bureau of Reclamation making the study. The Bureau of Reclamation is too much mixed up in it. It would be better to have an independent agency making that study.

I cannot see any reason or necessity for such an amendment in this legislation. I do not believe it wise for one department to attempt to do what some other department is equipped to do and has already begun.

Senator KUCHEL. Mr. Chairman, with all due respect to the chairman—and the chairman may be completely right—I think the fact remains that in the testimony yesterday or the day before, it was indicated that there is hardly any professional conclusions in this field, and that therefore it is impossible for a technically qualified witness to bring to this committee any professional or expert testimony on that very question.

Senator WATKINS. As of now. But they are making the study. It was started recently, as I understood the statement of one of the witnesses. They are going on with that.

Senator KUCHEL. Just one final question. Perhaps I should not ask you this, Judge. This is one which is of legal nature. I would like to ask whether, in your judgment, questions of the usability of

water ought to be pretty well determined before any legislation providing for the exchange of water is enacted?

Mr. BREITENSTEIN. No, I don't think so, Senator. If you waited for that to be determined, you would postpone all development.

May I point out this: In the lower basin they didn't wait to have those questions determined. When they put in the Metropolitan aqueduct or when they put in the All-American Canal or when they developed the Salt River project or the Gila project, they did all those things with these questions undetermined, and they did all of them while there were controversies in the lower basin as to the rights of the lower basin States.

We want to get it developed. We want to comply with the compact. We intend to comply with the compact. We recognize the lower basin has rights under that compact which we respect.

Senator WATKINS. But if we violate their rights, they always have their remedy.

Mr. BREITENSTEIN. That is correct, sir.

Senator WATKINS. We cannot anticipate breaches.

Mr. BREITENSTEIN. No. The presumption is that officials will comply with the law.

Senator WATKINS. Thank you, Judge.

Mr. BREITENSTEIN. Thank you, Mr. Chairman.

Senator WATKINS. Sam Ahkeah, chairman of the Tribal Council of the Navaho Indians is our next witness.

STATEMENT OF SAM AHKEAH, CHAIRMAN, NAVAHO TRIBAL COUNCIL, ACCOMPANIED BY NORMAN M. LITTELL, GENERAL COUNSEL, NAVAHO TRIBE

Senator WATKINS. We are glad to have you with us, Mr. Ahkeah. Do you desire to have your attorney sit by you during your testimony?

Mr. AHKEAH. Yes, sir.

Senator WATKINS. He may come forward.

Will you state your name for the record?

Mr. LITTELL. Norman M. Littell, 1826 Jefferson Place NW., Washington. I am general counsel of the Navaho Tribe.

Mr. AHKEAH. Mr. Chairman and gentlemen of the committee, I am Sam Ahkeah, chairman of the Navaho Tribal Council, now living in Window Rock, Ariz., and my home is at Shiprock, N. Mex., on the San Juan River. I make this statement on behalf of about 75,000 Navahos who live on some of the most arid lands in the North American Continent, embracing the Navaho Reservation having within its boundaries about 24,000 square miles or roughly 16 million acres of land.

The San Juan River flows along our northern boundary. In fact, until the United States acquired this territory from Mexico by the Treaty of Guadalupe Hidalgo, we owned land on both sides of the river. When the white settlers and military expeditions came to New Mexico in the 1840's and 1850's, they found our ancestors growing wheat, corn, beans, and other crops. They had well-developed peach orchards, and on one occasion carried blankets of peaches to a friendly military expedition.

We knew what the use of water would do to our land and in a primitive way used it. Kit Carson tells how our fields, crops, and

orchards were destroyed in 1863 in order to starve us out so that our people could not fight.

After captivity at Fort Sumner from 1864 to 1868, our people were restored to a portion of their former lands on the present reservation with a promise of 160 acres of agricultural lands for every head of a family who wished to select it, and half of that for a single person. As a matter of fact, this is still the law of the land under the treaty of 1868. Of course, it was impossible of fulfillment by the United States when the treaty was signed. At an early date, Army officers pointed out the possibility of irrigating large areas through use of the San Juan River, and the Navahos in limited areas demonstrated, as on my own farm at Shiprock, that they could be successful farmers where water was applied to the land. We became self-supporting citizens wherever there was a fair opportunity.

For about 100 years we have waited for a project which could irrigate a very large area of the reservation—about 122,000 acres at the Shiprock project and about 29,000 more adjacent to it embracing Indian-allotted lands. There are now about 100 Navaho families living on the lands which will be irrigated, all of whom make for themselves only a substandard living because the land cannot support them. When the land is irrigated, it will make about 1,500 farms of a size sufficient to support a Navaho family. This means 1,500 families supporting themselves directly from the project; or as near as we can figure, it will be about 7,800 people. These people will become self-sufficient and can live with dignity. They will become taxpayers, because even though we do not now pay taxes on our lands, when we make money we pay income tax, and whenever we buy things with the money we have earned, we pay the taxes on these things. Thus, you can see some of the money it costs will come back to the Government, even indirectly. It will not all be going out.

In addition to the people who live on the farms, there will be many other Navahos who will indirectly make their living out of the project. It will create villages with stores, filling stations, and all kinds of service businesses. We are told that at least 7,800 people not living on the project will be supported indirectly by the project. This means a total of about 15,600 of our people will be taken care of.

The proposed project area is now being used by approximately 128 Navaho families for grazing purposes. The area, when provided with the necessary irrigation facilities, is expected to provide 1,500 farms, each averaging about 70–80 acres in size. It is estimated that these farms will provide a standard of living for 7,800 people comparable to that enjoyed by the white water users within the basin. In addition to those people engaged in farming, about 7,000 people will receive the major portion of their livelihood from other enterprises directly supported by the farm activity. These lands, if facilities were available at present, would provide a living for about one-fifth of the Navaho people.

At first, the land should be planted to pasture grasses and forage for raising livestock and a small area used to grow garden produce and row crops. This use of the land is the most desirable initially, because the majority of the Navaho settlers will not be proficient in irrigation of their lands. They are successful in the livestock industry, provided the necessary feed and forage are readily available. The combining of irrigated pastures with livestock raising will result

in a more rapid adaptation to irrigation practices, a maximum farm income in a minimum period of development, and will provide the means of protecting the lands from initial poor irrigation practices. As the land user becomes more adept in irrigating, the use to which he puts his land and the crops grown should be such as to maintain a maximum annual return comparable to the white water user.

The present use of the area to be occupied by the Shiprock division as range land has a total carrying capacity of about 6,400 sheep units or 1 sheep unit for each 19 acres of land. This averages about 50 sheep units per family. Based on income of \$20 per sheep unit, a total annual income of \$1,000 per family unit is provided. Under irrigation the same land will have a total carrying capacity of about 500,000 sheep units, or 4.1 sheep units per acre. This averages about 328 sheep units per family. Based on above income per sheep unit, a total annual income of \$6,600 per family unit could be anticipated.

The resettlement of the Navaho people, now grazing their sheep over the reservation, to the Shiprock division area would release their present grazing area for others not having grazing rights at present or be used to enlarge the grazing area of those who remain.

Let me point out some additional results. One of the things we are promised in the 1868 treaty was schools and education for all our children. This promise, too, has never been kept. It is a difficult promise to keep in some ways, and expensive because of the large area of our reservation and because our children are so widely scattered. It is very difficult to build day schools because enough children cannot get there, and boarding schools are very expensive and are not satisfactory to us. We want our small children to live at home and have a family life just as you do. With this irrigation project a great many of our children will be living in a concentrated area and it will be much easier to provide schools and much less expensive to the taxpayers. The more our children are educated, the better they will be able to compete in society and in general, the better citizens they will make, and you will no longer hear of a Navaho Indian situation.

Nowhere in the Colorado Basin is there a more desperate need for water than on the Navaho Reservation, as you would all realize if you could see the Navaho families, including children, carrying water great distances to their sheep, going without adequate water themselves. We have waited patiently and worked patiently with our neighbors, realizing that others, too, need the water resources of the upper Colorado Basin, and we have been perfectly willing that our neighbors to the east even divert some of the water to relieve their own striking need.

It was, therefore, with great bitterness that we noted the striking out of the Navaho Dam and the Shiprock-San Juan project in the bill reported out of the House committee. I have listened with astonishment to the statement of Under Secretary Tudor explaining away this omission on the grounds that they do not now have sufficient information, and that at some indefinite future time when they do have such information the project may be considered.

This is not satisfactory. The trustee for the Navaho people, the United States Government, is not doing its duty when it neglects the tragic plight of the Navahos in favor of the far less crucial situations in areas favored by the Department of the Interior report.

I consider it essential to have the foregoing facts in the record before this committee, but it is now a great relief and a source of great pleasure to know that a decision has been made to include the Navaho Dam as an initial project in this bill. We have had that assurance from Senator Millikin in his statement on Tuesday, June 29, during these hearings.

In conclusion, I wish to have Norman M. Littell, general counsel for the Navaho Tribe, make a brief statement.

Senator WATKINS. We have a witness who has to catch an early plane.

Mr. LITTELL. I am through almost as I make it.

Senator WATKINS. I was going to say, if it takes any length of time, you can make it later.

Mr. LITTELL. I am practically suspending the privilege which you very kindly gave, Mr. Chairman, to make a statement, by this statement: I long ago learned as a young lawyer never to argue a case with the judge after you have won, even though you might have a very good argument which he ought to hear.

From reading the record yesterday and from what I hear about it, it was conceded here yesterday by Senator Millikin, and I think in a very fine statement by you, Mr. Chairman, that the Navaho Dam would remain in as one of the initial projects. If that is the situation, there certainly would seem to be no need for me to take further time of the committee to argue the case. That is all we are here for, Mr. Chairman.

Senator WATKINS. You heard the admonition of Senator Millikin a few weeks ago, "When you have won the case, do not talk yourself out of it."

Senator ANDERSON. As long as we can regard the case as won, we are happy.

Mr. LITTELL. I am following that policy. I was in hopes that perhaps the chairman would add a few more remarks about the situation of the Navaho Dam. It is, I think, settled, is it not, on the record of yesterday?

Senator WATKINS. The Navaho Dam is the one that I had in mind when I spoke about it. I said it was in the bill when introduced. I was in favor of it then, I was in favor of it for a long time before that, and I am still in favor of it. I can only commit myself, and that is all Senator Millikin can do.

Mr. LITTELL. I think that goes a long way.

Senator WATKINS. I would say also, in another capacity I am the chairman of the Indian Subcommittee, and we have been considering the problems of various Indian tribes. I know the absolute necessity of those Navaho people having some help down there with respect to water and any other thing we can give them to help them maintain life in that area. In fact, we have so many people to be sustained there now that unless we do something, we will have to begin a program of relocating many of them elsewhere.

Mr. LITTELL. That is correct, Mr. Chairman.

Senator ANDERSON. I think the record should show also that Senator Watkins is chairman of the Navaho-Hopi Rehabilitation Committee, and suggested the Navaho-Hopi Rehabilitation Act. I have had the pleasure of serving with him on the committee from the

day it was established. He has been very sympathetic, as Mr. Ahkeah knows and as you know, Mr. Littell, of the needs of the Navahos. What has been done is a sample of his interest in trying to bring education to the Navahos.

Therefore, I want you to know, Mr. Ahkeah, that when you read that part of your statement which showed how you wanted to bring the children together for education so they would cease to be a special Indian problem, the chairman of the committee was very much pleased about that, as I was. Both of us want to see that happen. It was a fine statement.

Mr. LITTELL. We Navahos are deeply grateful for the interest and understanding of both of the Senators before us now. I wish that some who aren't before us could feel the impact of that statement of Mr. Ahkeah's about the desperate plight on this reservation as you two well know it from personal experience, because there is absolutely no area in this whole project which remotely compares to that in the destitution of its needs for water.

Senator WATKINS. I agree with you.

Mr. LITTELL. You agree with that. Thank you, Mr. Chairman, for the privilege of coming.

Senator WATKINS. Thank you.

The next witness is Mr. N. R. Petry, president of the Denver Water Board.

Mr. N. R. PETRY (president, Denver Water Board). I am N. R. Petry, president of the Denver Water Board. I would like to introduce the witnesses respecting the relationship of the Blue River to the project. They are all witnesses to be classified as favoring the Colorado River storage project, and urging special deliberation by the Senate committee to guarantee a rounding-out of the project so that it will attain the greatest national benefit.

First I would like to introduce Mayor Quigg Newton, of Denver, a native of Denver, who during the 7 years that he has occupied that office has brought national recognition to Denver in a number of fields.

He has been president of the Colorado Municipal League and president of the American Municipal Association.

Mayor Newton.

Senator WATKINS. We extend you welcome, mayor. We are very happy to have you with us.

STATEMENT OF QUIGG NEWTON, MAYOR OF THE CITY OF DENVER, COLO.

Mayor NEWTON. Thank you very much, Mr. Chairman.

First I would like to say, Mr. Chairman, that I am here primarily as mayor of Denver to indicate to this committee that the Denver Water Board has the full confidence and support of the city administration, of myself and my colleagues, and of the city council.

I would like to present a brief statement concerning Denver and the Denver metropolitan area, if I may, sir.

Senator WATKINS. You may proceed. We will be glad to hear you.

Mayor NEWTON. Denver is one of the major cities of this country, ranking 26th in size among metropolitan areas according to the 1950 census.

Senator WATKINS. We have heard a rumor it is the second capital of the United States.

Mayor NEWTON. I am glad that you put that in the record, sir.

The growth of Denver from a collection of log cabins on the banks of the Platte River to a major American city has been steady and healthy, suffering neither the growing pains of boomtowns nor the sadening decline of the ghost towns.

The Denver metropolitan area population grew 38 percent from 1940 to 1950; from 408,000 to 564,000. It was apparent alike to people operating various units of government in this area, and to the business and working people, that a realistic appraisal of Denver's potential for at least two decades ahead was needed as a basis for planning. Land use, utilities, transportation—in fact, all of the complex interlocking facets of urban life had to be evaluated and planning anticipated to the end that Denver's growth would continue to be sound.

The Denver city government offered the facilities of its planning office for a thorough appraisal of Denver's potential. Cosponsors included the county commissioners of adjoining counties, representatives of the Metropolitan Area Municipal Association, the Denver School Board, the State of Colorado, and the United States Department of Commerce. In addition, an advisory citizens' committee of 70 prominent and representative businessmen was established, representing all phases of Denver's economy. Seven hundred firms, some located principally in Denver, and some branch offices able to secure home-office assistance of large national companies, aided the evaluation. This was truly a communitywide venture toward which the best talents of all interested parties were devoted. The purpose of this survey was to develop a hardheadedly realistic appraisal against which to base our future plans.

I now distribute to you, as an exhibit in this hearing, this carefully prepared and documented analysis entitled, "Working Denver." Mr. Mosely will distribute that to you.

One of the most significant results of the survey was a clear definition of the intimate relationship between the welfare of Denver and the welfare of the Rocky Mountain area. More than half of the impetus for Denver's growth during the last decade or two has resulted from growth and diversification of activity in our regional trade area.

The regional area has no clearcut boundaries. In its broader outlines, it may be said to consist of three distinctive parts: One, the primary area, which includes Colorado, Wyoming, the northern half of New Mexico, and the western edges of Nebraska and Kansas; two, the secondary area, which extends beyond the primary zone to midway in Montana, South Dakota, Nebraska, Kansas, Arizona, and Idaho. It includes also the remainder of New Mexico and parts of North Dakota, Oklahoma, Texas, and Utah. Three, the tertiary area, definitely on the margin of the region, which encompasses all of the western mountain and plains States not included in the other mentioned areas.

The community of interest is well recognized by most segments of the area. A good example is the close cooperation between Denver and Colorado Springs in preparing for the location of the Air Force Academy. Denver enthusiastically supported the site at Colorado Springs, and during the interim 2 or 3 years while the permanent

buildings are being constructed, Denver will be the Academy's temporary home.

Of course, the ties of Denver to the Rocky Mountain region are more than purely economic. Its cultural assets—universities and colleges, an outstanding symphony, the library and museums, the hospitals, the governmental services afforded by regional United States agency offices—all are shared with our neighbors in the Mountain States.

What does all of this portend for Denver's future—for that after all was the reason for the study. Assuming the continued western growth with the market areas, Denver could, on the basis of its realizable economic potential, reach a population by 1970 of at least 820,000—provided that the water is available to support such a population growth. All levels of Government recognize the importance of encouraging Denver's growth to continue—since the trend of welfare of the entire area will correspond to whatever the trend of Denver may be. The relation of water development to this economic trend is evidenced by the endorsement by the State of Colorado and by the upper basin States of Denver's proposed water development by connecting it with the development provided in this bill. At the Federal level of Government, the Reclamation Bureau has planned for many years toward water resources for Denver's continued growth.

I have been discussing Denver as a metropolitan area. It should be borne in mind that Denver has long taken the attitude that the welfare of the city and its suburbs is inseparable. We have been working for years on a mutual solution of problems which will maintain the integrity and autonomy of adjacent units of government. Denver has not taken the initiative in encouraging annexation but, on the contrary, has extended its public utilities well beyond the corporate limits of the city in all directions, thus making available to the suburban areas water and sewage—at moderate cost; standby fire protection—particularly for emergency situations; and technical advice on police work and traffic engineering, to mention the most common examples.

This attitude of recognition of the interest of suburban units of government has resulted in some difficulties in arranging financing, since the city assumes the responsibility for providing service to these suburban settlements, but does not have the authority to levy taxes to divide the expense with them. The problem is becoming increasingly more acute, since the population of the suburban areas is increasing at a considerably more rapid rate than is the city population. In addition, many major Federal installations are located in the suburbs and benefit from these services supplied by Denver taxpayers. Notable among these are the Atomic Energy Commission Arsenal, the Rocky Mountain Arsenal, Buckley Field, part of Lowry Field, Fort Logan, Fitzsimons Army Hospital, and the Federal Center.

Water is recognized by all of us as a critical resource—far too basic and essential to our common welfare to be a subject of partisan politics. Ever since Denver has had a municipal water supply, its management has been assigned to an independent board which is not answerable to the mayor. In fact, my only connection with the board is to appoint its members. Historically, the emphasis for selecting board members has been on the ability and community

interest of the individual—not on his politics. Two of the five present members were originally appointed by mayors who preceded me. One of them has been continuously a member for 25 years.

Throughout the years, Denver has made heroic efforts to assure water for the metropolitan area's continued growth. As you know, the city lies in an area of very deficient rainfall, which has forced us to extend our water systems over a vast area to secure adequate undeveloped water to support the community growth.

Historically, the Federal Government has aided in the development of western water resources because of the great returns it reaps from our economic development. The comprehensive development of the upper Colorado River for its highest and most productive use is a proper subject for Federal participation—hand in hand with State and local governments.

Denver, the greatest single economic unit served by the waters of the upper Colorado River is obviously a proper subject for inclusion in the unified effort for development of this great national resource.

Mr. Chairman, that is my statement.

Senator ANDERSON. How do you stand on S. 1555?

Mayor NEWTON. Sir, I am here, along with the other members of our delegation, to support S. 1555, with the proposed amendments.

Senator ANDERSON. Do you believe, as many of us do, that this Colorado River Basin project has to be treated as a whole unified project, and all of it done as early as can be done, not all of it started simultaneously, but all of it needs to be done to take care of the welfare of the entire basin?

Mayor NEWTON. I believe it should sir.

Senator ANDERSON. I know Senator Watkins and I do, and we hope that others do.

Mayor NEWTON. Yes.

Senator WATKINS. I should think that you would also agree that the total income from putting this water to beneficial use would be used to pay for the total cost of building the project.

Mayor NEWTON. That is right.

Senator WATKINS. Some of the projects standing alone might not have enough return revenues in and of themselves to pay out. In other words, sometimes on an irrigation canal, it costs very little for the man at the head of the canal to put water on his land, but he has to pay exactly the same rate and the same cost as the man 5 miles further on down the canal must pay.

Mayor NEWTON. There are other witnesses, sir, in our delegation to testify as to the manner of amortization of this total project, and I would rather not get into the details as to amortizing each and every project. But in general, I certainly agree with your principle.

Senator WATKINS. I was merely using it as an illustration of that principle. It is a cooperative thing, and we want to develop the whole basin.

If the income from the project overall is enough to repay the costs to the United States and leave something for the people themselves, then it ought to be built.

Mayor NEWTON. I believe it is a cooperative project. I agree in general with your statement of principle.

Senator WATKINS. Thank you, Mayor.

I think at this time we probably should take our recess, unless there is someone else who has to catch a plane in the next half-hour.

Mr. PETRY. No, sir.

Senator WATKINS. We will come back at 2 o'clock.

Mayor NEWTON. Thank you, Mr. Chairman and Senator Anderson. (Whereupon, at 12:30 p. m., the hearing was recessed until 2 p. m., of the same day.)

AFTERNOON SESSION

Senator WATKINS. The committee will resume session.

Senator Anderson wishes me to announce that he will not be able to come until a little later. He has to go to an Atomic Energy Committee meeting.

Mr. Petry, will you introduce your next witness, please?

Mr. PETRY. Thank you. The next witness is Mr. Calvin Snyder, manager of the Denver Chamber of Commerce. Mr. Snyder has spent 15 years in journalism and public relations work and 15 years in the organizational work of national trade associations before coming to Denver. The last 12 years were spent in Washington as a representative of the National Association of Real Estate Boards.

Mr. Snyder.

STATEMENT OF CALVIN K. SNYDER, MANAGER OF THE DENVER CHAMBER OF COMMERCE, DENVER, COLO.

Senator WATKINS. I understand you are representing the chamber of commerce.

Mr. SNYDER. That is right, sir.

Senator WATKINS. I mean for Denver.

Mr. SNYDER. That is correct.

With your permission, Mr. Chairman, I should like to make a few brief remarks, in the interest of conserving time and then file this statement to follow those remarks.

Senator WATKINS. We will accept the statement for the record at the conclusion of your remarks.

Mr. SNYDER. I am not an expert in the field of water or water development. My remarks I should like to direct to the economic development of Denver as it relates to the State, to the region and to the Nation. I think I should say at the outset so that the question will not be raised later, that the Denver Chamber of Commerce has supported by resolution S. 1555, and that I am appearing here today on behalf of the membership of the Denver Chamber of Commerce by authority of the executive committee and the board of directors of the chamber so directing me to do so.

Denver is a plain city on the east edge of the giant Rockies, and the State of Colorado is divided from north to south by the Continental Divide. Significantly, this mountain range is higher in the State of Colorado than in any other State from Canada to Panama. Thirty-seven percent of the total area of the State lies west and 63 percent east of this mountain range. Actually, less than a century ago wagon trains brought food supplies across the Nation with the destination as Denver. The purpose there was for the redistribution of those foods

and supplies to the many mining camps located throughout that particular area. It was then identified as a break-bulk city. Today I think transportation experts would identify it as a distribution center, and as was true more than 90 years ago, it is true today, Denver has developed into a distribution center. We have 7 class I railroads, many bus and truck freight lines, we have 5 airlines, all tied in with transcontinental service.

We believe that we can show, and that this statement will support, that Denver is a hub of the wheel for the economic growth of the Rocky Mountain region.

When I refer to the Rocky Mountain region, I am speaking of the primary region which was defined this morning by Mayor Newton in his testimony. It will be found on page 31. You have just referred to it, Senator, on page 31 of working Denver.

By way of identification, it is the market area and not the annexation. Quite obviously in the short space of time allotted to me I cannot possibly cover all of the economic factors that are pertinent to this particular legislation. I can only hope to cover a few of the highlights. I think that everyone will agree with me that Denver is undergoing a surge of growth unprecedented in its history. The early signs of these economic stirrings perhaps was more noticeable after an eastern capitalist announced that the firm he represented was about to invest and is today investing a multimillion dollar construction program in downtown Denver. Today that investment, based upon testimony before the CAB hearings a short while ago in Denver is in excess of \$40 million. It includes, first, a building known and identified as the Mile-High Center, an office building, a 23-story structure and now ready for occupancy; a 1,000-room Statler Hotel which construction we are advised in the press by this firm will start next month; a 400,000 square foot ultramodern department store, which will cost in excess of \$6 million; a 1,000-car parking building and operation directly across the street from the proposed site of the Statler Hotel and the department store.

Shortly following this announcement, another announcement indicated that Texas interests were very much in desire of locating in Denver for the development of office space and they have already started construction—as a matter of fact, construction has been completed to the external degree at least—on a 23-story office building, with occupancy to occur early this fall.

In addition a \$3½ million 14-story Denver Petroleum Club Building has been started—excavation has been started, I should say—and the construction of that project is estimated to be early in the spring of 1955.

In addition, an estimated \$5 million to be expended for the regional headquarters and operations for distribution purposes as well as retailing of one of the Nation's largest mail-order houses.

In addition to that, regional headquarters for a nationally known food chain have now been established through the construction of a tremendous warehouse and an expansion of their operation in the Rocky Mountain area, with Denver as headquarters. There is also a planned program now for the regional headquarters of one of the Nation's largest electrical manufacturing concerns to be located in Denver. Plus a \$2½ million National Farmers Union office building of 14 stories, which is now rapidly moving toward completion.

The significant part of this is that this major construction program which I have recited here has all occurred within a 2-year period. The reason I believe for this demand stems partly from the fact that 2,000 separate oil firms are now operating in the Rocky Mountain region. Oil production in 1953 in this region represented one-third of the entire national production. The increase in oil wells completed in 1953 as against 1952 was 45 percent, as against 8 percent for the national average.

The total of \$540 million in exploration, leasing, well development has been expended in 1953, and this amount we are advised will be exceeded in 1954 in this new operation.

As a matter of fact, we are told that more than 5,000 wells will be drilled in the Rocky Mountain region in the year 1954. I think it is significant that what is regarded as the greatest market movement in our modern history occurred between 1940 and 1950, according to the Bureau of the Census, when the shift of population center moved westward. The West—that is, the region identified by the Census Bureau as the West—has a 40.9 percent population increase, and no other region, geographic region, in the United States had an increase that exceeded 13 percent over the previous decade.

I think it is also significant to note that Denver is exactly 250 miles west of the geographic center of the United States. During this period of time of growth and development, it hasn't been in the form of spurts. It has been steady and continuous. Denver manufacturing, wholesaling, distribution, and construction has kept apace with or ahead of the area development.

Seventy-five percent of the products produced in Denver and the metropolitan area of Denver are sold outside of Denver. By the same token, 75 percent of the material used for the manufacture of these products was purchased outside of Denver, much of it in the region. We estimate that it is more than 80 percent. Considerable of this distribution has been on a national level, and increasingly so on the international level, through the operation of foreign trade programs. There now are more than 80 firms operating in the Denver metropolitan area who export to foreign countries.

I think it is also significant to the committee to know that a customs office operation is maintained in Denver, a mile high and 1,000 miles inland. Commodities that come in consigned to areas west of Denver and through the Denver regional area are simply stamped at the point of import and shipped on to the customs office in Denver for processing.

I think that the evidence shows that the economy of the entire region depends on Denver, and Denver depends upon the economy of the entire region. It is a two-way street to this rapidly expanding economy.

I think it is also of importance to recognize the relationship of the region of the Denver metropolitan area to the national picture.

For example, in that area uranium, molybdenum, and titanium are strongly affecting the economy of the entire region as well as Denver.

The Atomic Energy Commission has its Colorado headquarters now located in the area with more than 2,000 on the payroll. The Rocky Flats Atomic Arsenal just outside of Denver has more than 2,100 permanent employees. We have prepared a table to reflect the investment by the Federal Government in the Denver metropolitan area, and I should like to read that table. The Federal center, valua-

tion \$43,500,000; downtown facilities, \$53 million; the Veterans' Administration hospital, \$10 million; Fitzsimmons Hospital, \$10,500,000; the Federal Correctional Institution, \$1,500,000; Buckley Field, \$14,100,000; Lowery Field, \$45 million; Fort Logan, \$2,500,000; the Rocky Mountain Arsenal, to which I have previously referred, \$125 million; the Rocky Flats Atomic Arsenal, \$43,700,000, and the Bureau of Public Roads, \$800,000, for a total of \$378,600,000, more than a third of a billion-dollar investment by the Federal Government in the Denver metropolitan area.

I think it is also significant to point out that there are presently employed, as of May 1, 1954, approximately 17,000 Federal employees, living and working in that particular area.

The reason I bring these figures to your attention, Mr. Chairman, is the fact that there is a charter provision in the city of Denver that provides that the area beyond the geographic outline of the city limits, and in some instances just a bit beyond that point, is an area identified as a blue line. Beyond that point, expansion and the use of water served by the City and County of Denver Water Board, cannot go without specific approval, without certain conditions existing. But at least it is the prohibitive area.

Yet most of these Federal installations are located beyond the city limits of Denver. Denver has, and is continuing, and we hope we may continue for many years to come, to provide the water necessary for this tremendous Federal investment. However, because of this tremendous growth and because of this rapidly expanding economy, we are dependent entirely upon the diversion of waters from the Colorado River or its tributaries, and the development of a portion of that water from the Blue River for Denver, as an integral part of our potential future.

The \$23 million tunnel to bring Blue River water for use in Denver which will be discussed by other witnesses cannot be completed, I am advised, in less than 7 years, and yet in 8 years, 1962, water from the project will become an absolute necessity for Denver. I think it is more or less recognized in the West that water is a common problem of all and it is universally recognized as vital and unprofitable, and that there is a necessity for the development of this basic resource by the various governmental agencies working in harmony.

We feel that through our prepared statement and a few of these notations that I have presented here, that we have shown that economy of the Rocky Mountain area is tied in and dependent upon Denver's economy and Denver's future is dependent upon the Rocky Mountain area. Because of the tremendous Federal Government investment in the metropolitan area, we feel it is reasonable to conclude that the development of the Denver area is a matter of concern not only to the Rocky Mountain area, but the Nation as a whole, and the coming of the Air Academy to Colorado provides additional evidence of this national interest in Colorado.

Other witnesses will show that in the foreseeable future, 1962, that 1962 is the breaking point when this expanding economy of the entire Rocky Mountain region must rise or fall, depending upon the provision of water from the Blue River. We respectfully request the committee to give favorable consideration to the amendment covering the Denver situation, which will be proposed to the bill S. 1555 now before this committee.

Senator WATKINS. Thank you very much.
(Mr. Snyder's statement follows:)

STATEMENT OF CALVIN K. SNYDER, MANAGER, CHAMBER OF COMMERCE,
OF DENVER, COLO.

Mr. Chairman and members of the committee, I am Calvin K. Snyder, manager of the Chamber of Commerce of Denver, Colo. Our offices are located at 1301 Welton Street, Denver. We have in excess of 3,600 members in the Denver Chamber of Commerce, representing a cross section of business, industry, and agriculture from throughout the metropolitan area of Denver. I am appearing here today on behalf of our membership, by authority of the executive committee and board of directors of the Denver chamber.

We are most appreciative, Mr. Chairman, of this opportunity to appear before your committee, and to participate in these hearings.

Denver is a plains city on the east edge of the giant Rockies. The State of Colorado is divided from north to south by the Continental Divide. Significantly, this mountain range is higher in the State of Colorado than in any other State from Canada to Panama. Thirty-seven percent of the total area of the State lies west, and sixty-three percent east of this mountain range.

Less than a century ago, when wagon trains brought food and supplies across the Plains, their destination was Denver, where the cargo was broken and reconsigned to the numerous mining localities in the mountains. Break bulk is what they called it. Today's transportation specialists term it a "distribution center," a center serving a thousand-mile radius.

Denver today is the hub of the wheel for the economic growth of the entire Rocky Mountain region. As the distribution processes expanded, so grew the wholesale, retail, financial, industrial, and transportation elements of this "break bulk" city. Now that the roots of commerce are deep and markets growing daily, Denver is being "discovered" by investors and capitalists as a center for oil, uranium, and manufacturing. This means people. Today, an estimated 2,000 persons monthly are taking up permanent residence in Denver.¹

The city is undergoing a surge of growth unprecedented in its history. After a very successful World War II production record, during which 14 percent of the Denver firms engaged in war contracts were awarded the Army-Navy "E" for excellency in war production, compared with about 5 percent as the national average, local manufacturers witnessed no serious production drop.

Early signs of economic stirrings came when an eastern capitalist announced his intention of investing more than \$40 million in Denver's downtown area.² Closely following, Texas interests announced the construction of a 23-story office building to furnish space primarily for a large influx of oil companies, which are stimulating Colorado's meteoric oil production record. Denver's petroleum club has just completed excavation for a new 14-story office building, which is

¹ Sales Management magazine, Denver Chamber of Commerce research department.

² Arthur Rydstrom, Webb & Knapp, testimony before Civil Aeronautics Board hearing, May 18, 1954.

estimated to cost about \$3½ million. A new \$2½ million office building is being built on Denver's Capitol hill by the National Farmers' Union.

Included in the \$40 million figure mentioned above is a new 1,000-room hotel, an ultramodern department store, a regional operation of a major food chain, a multi-million-dollar operational regional headquarters of one of the Nation's largest mail-order firms, and a regional headquarters for one of the Nation's principal electric manufacturing concerns. Comparative figures show that when all current buildings are completed, the city's demands will still be barely satisfied. For the total of 6 million square feet of downtown office space available in 1946, there were approximately 475,000 people in the metropolitan area. This established a ratio of 12½ square feet per person, and there was then a shortage of space. In 1955, the metropolitan area will have an estimated 685,000 people, which, according to the ratio, would indicate a need for 8 million square feet of space, and present growth points toward only 7½ million square feet of space by 1955, which means the city will not yet have caught up with its demands.

The demand for office space stems partly from the 2,000 separate oil companies now operating in the Rocky Mountain region, a major new source of petroleum and natural gas. Mayor Newton has already defined what we refer to when we use the term "Rocky Mountain region." The Rocky Mountain oil production gain last year was one-third of the entire national increase. The number of wells completed in the region jumped 45 percent from 1952, against the nationwide rise of only 8 percent. It is estimated that the oil industry last year spent \$584 million on exploration, leasing, and well development in the Rocky Mountain area, which is expected to be exceeded this year. Over 5,000 new wells are to be completed in the Rocky Mountain area alone in 1954.³

As a manufacturing town, Denver almost defies analysis. The State's larger manufacturers grew out of necessity, and have thrived on resourcefulness. The reasons can be attributed to the raw materials available, the high productivity of labor, an improved and ever enlarging market, and excellent radials of transportation.

What is regarded as the greatest market movement in the United States is the western shift of the center of the United States population during the past decade. Between 1940 and 1950, the West had a 40.9 percent increase in population, whereas no other region increased by more than 13 percent.⁴ The geographical center of the United States is precisely 250 miles directly east of Denver. As the population continues west, this proximity to the geographical center will make Denver more and more accessible to the mass markets of the United States.

Denver manufacturers continue to expand operations and enlarge production, and, like the mountain moving to Mohammed, the market is coming closer and closer to Denver.

The previous witness, Mayor Newton, has given you an insight into the economic backdrop of Denver as it is related to the State, from the viewpoint of the public administrator. I should like to direct my remarks to the economic development of the metropolitan Denver area,

³ Maurice Goodwin, Petroleum Reporter, in testimony before CAB hearings, May 18, 1954. In Denver.

⁴ U. S. Department of Commerce.

its relationship to the State, regional, and national picture, from business' viewpoint.

May we pose the question, "What factors are considered important to the development of and sustaining an expanding economy?" First of all you must have something to sell—goods or services. Secondly, there must be a market for goods or services. Third, an adequate labor force to produce and sell. Contributing factors that must keep apace include: transportation, utilities, and construction.

A word should be mentioned here concerning the high, dry climate existing in the metropolitan Denver area, which is conducive to precision tool and instrument production. As a result, there are many types of industries in this field located in the Denver area. Denver lives by producing or being the center for a wide assortment of items and services, such as V-belts, veterinary antibiotics, rubber tires, luggage, instruments, mining equipment, tools, plastics, and a host of other items, not only for exchange among members of its own population, but what is vastly more important, for exchange for products from the outside. The latter is Denver's export business, which extends into regional, national, and foreign markets.

Therefore, it can be concluded that Denver's justification for existing as a metropolitan area lies in the fact that as a heavily populated unit it can more effectively produce goods and services, for which, in exchange, it receives a correspondingly large amount and variety of things desired. Production and exchange, however, do not mean production and exchange confined to the boundaries of the four counties making up the Denver metropolitan area.

The Denver economy is made up of relatively small units engaged in varied activities. Diversification of Denver's manufacturing is reflected in the fact that of approximately 600 firms in Denver, about 85 percent employ fewer than 100 persons. Approximately 75 percent of Denver industry products are sold outside of the metropolitan area. By the same token, sources of materials for processing show a similar pattern in which, again, approximately 75 percent of the materials used come from outside the Denver area.⁵ This reveals that Denver's industrial picture, whether in terms of markets or of sources of supply, can in no sense be regarded as "local" in character. Rather, it is in a large degree a part of the national, and possibly to an increasing extent, the foreign industrial scene.

Marketing the products Denver manufactures is channeled through direct representatives of the manufacturer; wholesalers and distributors located in Denver metropolitan area; and retail outlets located in the area. Herein can be found the basis for the close link between Denver's economy and the economy of the entire Rocky Mountain region. It is estimated that some 54 percent of Denver's sales of goods and services outside the metropolitan area were made in the primary region.

Denver's sales to the primary region are not a one-way street. It also buys from the region a variety of products to be used for further processing and resale. This supplies the region with the purchasing power to buy from Denver. The rate and volume of this circuit flow of goods and services govern the growth of both Denver and the region.

⁵ Working Denver, City Planning Board.

The 1950 census reported a total of 2,296,805 persons residing in the primary region. Of this number, 25 percent were located in the Denver metropolitan area; 33 percent in Colorado, exclusive of Denver, 13 percent in Wyoming, and 29 percent in New Mexico.⁶

Within the primary region we find agriculture and livestock, molybdenum, uranium, titanium, petroleum and gas, coal, gold, silver, copper, zinc, lead, manufacturing, wholesale and distribution, retailing, and service industries as the contributing factors to the economy.

It is estimated in the wholesale and distribution industry that in the Denver metropolitan area there are more than 1,500 firms with a total employment of more than 20,000, and an annual payroll in excess of \$65 million. Approximately another 40,000 persons are employed in the retail trade.⁷

It is important to mention at this time the economic relationship of the Denver metropolitan area to the Nation. Uranium mining, one of the brightest luminaries in the Colorado economic picture, is strongly affecting the Denver economy. The United States Atomic Energy Commission is using all means possible to increase the supply of fissionable material. A sizable portion of this uranium program is being channeled through the Colorado and Denver economy. The AEC now has nearly 2,000 men on the Federal payroll operating out of Colorado headquarters. There are nearly 550 uranium producing mines in the Rocky Mountain States, and new discoveries are being made daily.⁸

The Rocky Flats Atomic Arsenal, located just outside of Denver, employs over 2,000 persons on a permanent basis.⁹ This Colorado atomic weapons plant in all likelihood will continue to produce atomic weapons until the world situation ameliorates.

Denver is strategically located as a regional governmental center. It is almost equally distant from Minneapolis and New Orleans, and from Los Angeles and Washington, D. C., by air. Recently Denver has experienced a marked growth of agencies having a wide jurisdiction, covering as much as three-quarters of the Nation, or more in some cases.

It may be of interest to the committee to know something of the investment of the Federal Government in the metropolitan Denver area. It follows:

Federal investment in Denver

	<i>Valuation</i>
Federal Center ¹ -----	\$43, 500, 000
Downtown facilities ¹ -----	63, 000, 000
VA hospital ¹ -----	10, 000, 000
Fitzsimons hospital ¹ -----	10, 500, 000
Federal correctional institution-----	1, 500, 000
Buckley Field ¹ -----	14, 100, 000
Lowry Field ¹ -----	45, 000, 000
Fort Logan-----	2, 500, 000
Rocky Mountain Arsenal-----	125, 000, 000
Rocky Flats Atomic Arsenal-----	43, 700, 000
Bureau of Public Roads-----	800, 000
Total -----	373, 600, 000

¹ These figures are acquisition costs adjusted upward by 25 percent to represent current market valuation.

⁶ Working Denver.

⁷ Denver Chamber of Commerce, research division.

⁸ AEC offices, Colorado.

⁹ Letter of June 18, 1954, to chamber of commerce.

Number of Federal employees in Denver

	<i>Number of employees¹</i>
December 31, 1951.....	18,992
May 1, 1954.....	17,000

¹ Exclusive of military and hospital personnel, but including 145 agencies.

Denver's labor force has adjusted to the increased demand for workers. This was accomplished in three ways: first, by immigration; second, by natural accretion, that is, as resident young people increased in age, they moved into the labor force; and third, by employment of a larger proportion of persons, who might ordinarily have been outside the labor force. Denver's rate of employment increase of 56 percent in a decade was fourth from the highest in an analysis of comparable western metropolitan areas, preceded only by San Diego, San Antonio, and Dallas.¹⁰

The relatively high rate of employment increase experienced by the Denver area, and the fact that this rate could be supported by an adequate labor force, points not only to the substance of the new job attractions, but also to the high potentials of the existing labor market. It is also significant to note that employment changes between 1940 and 1950 did not materially alter the basic occupational and industrial pattern. Trade and service activities continue to be preeminent as the source of Denver's employment.

May I give you several cumulative comparisons reflecting the impact upon Denver's metropolitan area economy, as recorded in Denver, the weekly publication of the Denver Chamber of Commerce, showing the changes between June 1939 and June 1954. In the first 5 months of 1939, bank clearings in Denver were \$597,500,000. For the first 5 months of 1954, bank clearings in Denver were \$2,978,600,000. In the first 5 months of 1939, the number of building permits issued was 2,697. In the first 5 months of 1954, the number of building permits issued was 21,200. The value of building permits in the first 5 months of 1939 was \$5,600,000. The value of building permits in the first 5 months of 1954 was \$32,300,000. Electric current consumed, in kilowatt-hours, in the first 5 months of 1939 was 96,300,000. In the like period of 1954, 468,300,000.

We mentioned before the importance of transportation. The Denver metropolitan area is served by 7 class 1 railroads, 5 airlines, several bus lines, and 7 motor freight lines. The area is on a transcontinental route in one or more instances in each type of transportation.

Presently before the Civil Aeronautics Board are applications from 10 airlines seeking permission to serve Denver. As would be assumed, rail freight is largely used for incoming shipments, and motor freight used for distribution. As the flow of goods increases between East and West, Denver will grow as a terminal. There is every evidence, owing to the city's strategic location, and the fixed capital all ready for existence, to predict a continued expansion of Denver's transportation system.

Water and sewerage are the two municipally owned utilities in Denver. The water is under the exclusive control and jurisdiction of the Denver Board of Water Commissioners. This independent board manages the water system on a completely self-sustaining business

¹⁰ United States Census, 1950 and 1950 preliminary.

basis. Sewage collection and disposal is the responsibility of the manager of improvements and parks, a department head appointed by, and responsible to, the mayor. The system is a tax-supported public service.

The other three major utilities are privately owned and operated. Electric power and gas are provided by the Public Service Co. of Colorado. Telephone service is provided by the Mountain States Telephone & Telegraph Co., a subsidiary of the Bell System, covering seven Western States.

Now we come to the most important factor in Denver's economic development and expansion—water.

In 1933 Denver found herself completely without water reserves and, with a supply for only 30 days as the result of a long-continued drought, which demonstrated conclusively that there is not enough water in the south Platte River Basin, where Denver is located, to supply the city's water needs. Through transmountain works, Denver has developed a partial supply from the headwaters of the Fraser and Williams Rivers, which are tributary to the Colorado River. This supply has enabled Denver to meet its current demands.

Due to the acceleration of Denver's growth in the past decade, even with the full and complete development of its Fraser and Williams resources, 1962 will find Denver without the water resources for further population increase.

Because Denver's continued growth is completely dependent upon the diversion of water from tributaries of the Colorado River, the development of a portion of the water from the Blue River for Denver is a necessary and integral part of any comprehensive plan for utilizing Colorado's share of Colorado River water.

The 23-mile tunnel to bring Blue River water for use in Denver, which will be discussed by other witnesses, cannot be completed in less than 7 years, and yet in 9 years water from the project will become an absolute necessity for Denver.

In the West water is the common problem of all and is universally recognized to be so vital, and unprofitable, that there is a necessity for the development of this basic resource by the various governmental agencies working in harmony.

It is a proper balance of the use of money for the development of the upper Colorado River Basin as a whole, that is essential to the well-rounded development sought by this bill.

We feel we have shown conclusively that the economy of the Rocky Mountain area is tied in and dependent upon Denver's economy, and that the future of Denver depends upon the economic development of the Rocky Mountain area.

Because of the tremendous investment by the Federal Government in the metropolitan area, we feel it reasonable to conclude that the development of the Denver area is a matter of concern, not only to the Rocky Mountain area but to the Nation as a whole. The coming of the Air Academy to Colorado provides additional evidence of a national interest in Colorado.

Other witnesses will show, through documented evidence and charts, that in the foreseeable future, 1962 is the breaking point when the expanding economy of the entire Rock Mountain region must come to an abrupt halt unless provision is made for water from the Blue River through the construction of a transmountain tunnel.

We respectfully request the committee to give favorable consideration to the amendment which will be proposed to the bill now before this committee.

Senator WATKINS. Call your next witness, please, Mr. Petry.

Mr. PETRY. The next witness is Mr. Allen P. Mitchem. Mr. Mitchem served as a pilot in the United States Marine Corps during World War II. He is one of the many thousands of people who have moved to Denver since the war. He is a member of the water resources committee of the Chamber of Commerce and a member of the Junior Chamber of Commerce, and has served actively as a member of the J. C. water committee and governmental affairs committee.

He is a professor of law at the University of Denver.

Mr. Mitchem.

STATEMENT OF ALLEN P. MITCHEM, DENVER JUNIOR CHAMBER OF COMMERCE, DENVER, COLO.

Mr. MITCHEM. Mr. Chairman and members of the committee, the 500 active members of the Denver Junior Chamber of Commerce, which I have been authorized to represent, exemplify the young blood of our community, a cross section of almost every type of business or profession. They will be the captains of industry, the leaders in the community life of Denver in the next 10 to 20 years. It will fall to their lot to pay the bills incurred by the present controlling generation. They, therefore, have reason to be cautious in examining proposals for new expenditures which will create indebtedness. On the other hand, this is the age group which will reap the benefits of the foresight of this present generation in preserving our valuable natural resources.

We of the Denver Junior Chamber of Commerce are vitally interested in the growth and development of Denver and of the State of Colorado. The potential success of our efforts to realize that growth and development is, because of our arid climatic conditions, more closely tied in with the problem of most effective use of available supplies of water than any other single economic or physical factor.

It is a matter of simple calculation for us of the Denver JAYCEES to see that, with the present rate of growth of the Denver metropolitan area and with Denver's present water resources, an increasingly serious and permanent water shortage will develop by 1962. Already water is being rationed in Denver and its suburbs because of an unprecedented drought condition. This water shortage looming in the immediate future will inevitably place a serious limitation on the city's future growth unless additional water sources are made available. It is only natural that we, the members of Denver's Junior Chamber of Commerce, have a deep concern in helping Denver get the water it needs.

Having recognized initially that obtaining a new source of water is imperative, it becomes at once apparent that there is little choice as to what that source must be. In Colorado we can derive little direct benefit or satisfaction from progress which is being made in demineralizing saline waters. Our water must come from rivers. Furthermore, substantially complete use has already been made of those portions of the total flow of the South Platte River, the Arkansas River, and the Rio Grande River to which the State of Colorado is

entitled. The contrary is true, however, of the Colorado River and its tributaries which represent the only source of water available to satisfy the critical needs of Denver and its surrounding metropolitan area. Adequate supplies of water, which have not been appropriated for any consumptive use, are available in the Blue River, a tributary of the Colorado, to supply the needs of the Denver metropolitan area for many years to come.

The plea which we made for a Federal loan for the construction of the works necessary to obtain this water is not motivated by selfish interests on behalf of Denver residents, for as the previous witnesses have emphasized, Denver is a vital link in the economy of the entire State. In 1950, 37 percent of the population of the entire State of Colorado was served with water from the Denver water system. This percentage figure has been increasing steadily for the past 50 years. Unless there is a continuation of aggressive development of our water resources so as to make adequate provision for the Denver metropolitan area, this generation will have cast a blight upon the future of all Colorado, which will reflect an injury upon the national economy as a whole.

The matter of making adequate provision for the future water needs of Denver is not one that can be put off for 10 years, or 5, or even 1. Action should be taken now. As the tunnel necessary to convey this water to Denver will be the longest in the world, construction will not be complete until approximately 1962 if funds for the work are made immediately available. In the meanwhile, either an increase in the present rate of the city's growth or a continuation of subnormal precipitation would create a disastrous shortage of water.

In 1852, Daniel Webster spoke to the Senate in opposition to a program for the development of railroads to open up the West. He said:

Mr. President, I will not vote 1 cent from the Public Treasury to place the Pacific Ocean 1 inch nearer to Boston than it is. What do we want with this vast worthless area—this area of savages and wild beasts, of shifting sands and whirlwinds of dust, of cactus and prairie dogs? To what use could we ever hope to put these great deserts or those endless mountain ranges, impenetrable and covered to their very base with eternal snow?

We of the Denver Junior Chamber of Commerce feel that we can provide the answers to Mr. Webster's questions, if water which is available is conserved and put to its most effective use. The rapid increase in our population and industrial development in recent years is a result, in part, of a realization that out of this "area of shifting sands" and these "endless mountain ranges" there is emerging an area in Colorado with natural resources making it unsurpassed anywhere in the world as a potential center of thermal power development, and an area unsurpassed in the world as a desirable place in which to live.

We are confident that the Members of the present Congress will also desire to accept the challenge and help provide an answer to Daniel Webster.

Senator WATKINS. Thank you very much.

Your next witness will be whom please?

Mr. PETRY. Glenn G. Saunders has been the attorney for the water board for the past 25 years. He is a member of the water section of the Colorado Bar Association since its inception, past chairman, and chairman of the ground water legislation committee of the Colorado

Water Conservation Board, and for many years Colorado member alternate on the resolutions committee of the National Reclamation Association.

He is a member and secretary of the Colorado Weather Control Commission, a member of the water committee for the Denver Chamber of Commerce, and attorney for the water board.

Mr. Saunders.

STATEMENT OF GLENN G. SAUNDERS, ATTORNEY FOR THE BOARD OF WATER COMMISSIONERS OF DENVER, COLO.

Mr. SAUNDERS. I would like to refer to the map which we put on the easel and a copy of which you have in the exhibit which Mayor Newton introduced in Working Denver. Page 105 of that exhibit is the map to which my testimony will now briefly refer.

As may be seen by a reference to this map which is on page 105 of Working Denver there is a heavy line drawn around a watershed near the bottom of the map, and just to the south of Denver. That heavy line represents the watershed of the South Platte River from which Denver historically derived its supply of water in the early days. That South Platte River produces only a limited amount of water. It is well overappropriated. And the amount of water which Denver can receive from that watershed is limited by the lawful appropriations which it has. There may be a little additional water which could be taken off of farms and thereby injure the general economy, not only of the local area but of the Nation, by destroying an existing civilization.

But aside from that the Platte River can produce no more water for the city and county of Denver than it now has under its existing appropriations. That water supply ran out in 1933, completely, and beyond that time every drop of water that we have had for the expansion of Denver during the last 20 years has been produced from another watershed. That other watershed is the Colorado River. The first tributary of the Colorado River which was tapped was the tributary known as the Fraser River, which is shown on this map just a little above the center of the map on page 105.

The Moffatt Tunnel is the carrier of the water from the Fraser River.

Senator WATKINS. How much water could they bring over from there?

Mr. SAUNDERS. That resource has not yet been fully developed, but at the present time about a third of our supply or approximately 35,000 to 45,000 acre-feet a year can be controlled in an average year.

In a year like the present year, we will be lucky to get 10,000 acre-feet of water, although our annual consumption now is 150,000 acre-feet a year. I have another exhibit that is going to break this thing out as to where this water can come from very explicitly. I am simply showing the geography from this one exhibit on page 105. There is also a small supply of water just south of Fraser River which comes from the Williams Fork River, another tributary of the Colorado River. Those two supplies are being controlled by existing works or extensions of existing works. On the other exhibit I will demonstrate how much they can produce in water.

Now for the rest of the physical geography of the situation. To the south of those two Continental Divide supplies, which lie just west of the top of the Continental Divide referred to by Mr. Snyder, lies the Blue River supply, which Denver proposes to tap.

Senator WATKINS. Will you indicate it on the map, please?

Mr. SAUNDERS. On the map the Moffatt Tunnel supply is near the center of the map. The Williams Fork is immediately to the south of it, and the Blue River is to the south of that, the Blue River being the area above Dillon. The heavy line around that area indicates the watershed. These areas are very productive of water because the snows pack in there very deep, so that the high ranges are able to produce a substantial amount of water.

Senator WATKINS. How far is that from Denver?

Mr. SAUNDERS. I would have to guess, Senator. But let us say on an airline it must be 45 or 50 miles, in an airline. By automobile it is considerably farther. The method of collecting the waters of Blue River is to let nature run this water down the Ten-Mile Creek, the Blue River, and the Snake River, which converge at Dillon, and then for Denver to run a tunnel from Dillon, underneath the Continental Divide, 23 miles, in a general easterly and southerly direction to the North Fork of the South Platte River.

That water would be of no value to us if we could not store it, because from those high mountain areas the great bulk of the water comes off in the 2-month spring of the year, and in the fall and winter it would be gone.

So down the North Fork and marked on the exhibits is the Two Forks Reservoir, a very substantial reservoir in size.

Senator WATKINS. Is it already built now?

Mr. SAUNDERS. No, sir. It can be built to any size that is necessary to control the water. The Two Forks Reservoir is not in existence. At the present time there is in existence on the South Platte River starting at the south, the Antero Reservoir, holding about 32,000 acre-feet, downstream from that, the 11-mile Canyon Reservoir, in existence, which holds 80,000 acre-feet and the Chiesman Reservoir which holds 80,000 acre-feet.

You can see there, there is about 200,000 acre-feet of capacity for a city which now uses 150,000 acre-feet per year.

On the Moffatt Tunnel side of the system, the only reservoir control at the present time is Ralston Creek Reservoir. We are now constructing and will finish this winter so as to have it ready for next spring, reservoir 22, which lies still further north and west of Denver, on South Boulder Creek and which will be able to control the waters of the Moffat Tunnel. At the present time we have inadequate control for that.

In addition, we want to carry the waters over there so that they can be controlled by reservoir 22, from Moffatt Tunnel.

Moving to another exhibit, copies of which will be furnished to the committee as soon as I can physically reach them on the table, this exhibit is entitled "Denver Water Requirements." It is to be noted that on this exhibit we have certain years marked with verticle lines, 1930, 1940, 1950, and so on. The horizontal lines across this exhibit show 40, 80, 120, and so on.

The figures there represent acre-feet of water in thousands. That is, a use of water of 80,000 acre-feet runs across in a horizontal way

just above where, on the right-hand side of the exhibit is a cross-hatched area marked South Platte River, South Platte. Under South Platte are the figures 77,000 AF, meaning 77,000 acre-feet.

That is the total amount of average dependable supply which we can receive under our lawful priorities from the South Platte River. Since we are now using 150,000 acre-feet, it is obvious that that does not at all supply our requirements.

Next above that is the Moffatt tunnel, which will supply, when completed, and it is not now completed, approximately 80,000 acre-feet of average annual dependable supply.

Above that is the Williams Fork, marked 16,000 acre-feet. Across this map from the left to the right, on an ascending line, is a dotted line, which shows the average trend of water requirements for the city of Denver. The solid line which criss-crosses the dotted line is the actual water uses from year to year. Those water requirements go up and they go down. When we have a wet year, our water uses go down. When we have a dry year, our water uses go up, which makes it very bad.

As at the present time, we have a drought. It means that everyone wants to irrigate his lawn and needs more water than usual. That is the reason we have had to put special restrictions on to save water this year. But when we look at these lines, we notice a very definite trend. This trend was first figured out by the firm of engineers about 20 years ago, and the events have proven the accuracy of their prognostications. We have actually followed their trend very, very accurately, when you take the whole thing and iron it out. If you follow this trend, we can see that we will run out of a supply of water from the Moffatt tunnel and the South Platte River about the year 1960, and that when we add to that the supply of water from the Williams Fork, we get up to that supply in about 1962, 1963. That is an average. If we have 7 years of drought, we will run out of water very much sooner than that. If we get some big years, it could be a little bit longer. But no true board of water commissioners could ignore this line, this actual trend of the use of water for the city of Denver. Nor could it fail to take into account the fact that we will run out of water from our present sources, the Platte River, the Moffatt tunnel and the other one, about 1963, and then become dependent on the last source, shown on this as the Blue River, with an average annual dependable supply of 177,000 acre-feet.

Senator WATKINS. Do you get water out of the Blue River now?

Mr. SAUNDERS. At the present time we cannot get water there, because that water must be diverted through a tunnel 23 miles in length and as Mr. Snyder said it is going to take 7, 8, or 10 years to build that tunnel.

Senator WATKINS. Do you get anything out of the Big Thompson project?

Mr. SAUNDERS. No, sir. The Big Thompson project lies to the north of the city of Denver and at the present time even Boulder has been too far south for the Big Thompson project. But works under construction and to be completed this winter will make Big Thompson water available to the city of Boulder, which lies 35 miles northwest of Denver. That water is not available to us.

Senator WATKINS. It isn't the fact that there isn't enough; is that it?

Mr. SAUNDERS. Probably not enough, and further, gravity takes care of the situation. The country slopes downhill to the north, and we lie higher than the Big Thompson. The fortunate thing about the Blue River project is, as you can see from the exhibit which is at page 105 of the Denver exhibit Mayor Newton introduced, is that the waters of the Blue River flow into the North Fork of the South Platte which is well upstream from Denver, flows downhill and are caught in the Two Forks Reservoir and there diverted by gravity into Denver and the whole area which can be served by gravity without the expense of pumping. On this map, we find another detail and it is a very important detail.

One of the reservoirs which was built in connection with the Colorado-Big Thompson project is the Green Mountain Reservoir. That reservoir has two functions. One, storage, which I don't care to refer to because it doesn't have anything to do with this picture. We are not concerned with the picture. But it also has there a hydroelectric plant, capable of diverting the entire flow of the Blue River. I wish to explain this because there is litigation pending between Denver and the United States Government regarding this which does not affect this litigation. Some have said that it did, just as some have said that the Arizona-California suit affects this.

Senator WATKINS. You mean legislation.

Mr. SAUNDERS. Legislation, I mean. Just as some have said that the Arizona-California suit affected this legislation, some have said that the Green Mountain situation will affect this legislation. I wish to point out the situation so that the committee can be assured that what Denver seeks here does not affect the litigation, and that the legislation here can proceed without any interference with the litigation whatsoever.

It is obvious from an examination of the map that since Green Mountain Reservoir lies on the Blue River and downstream from Denver's point of diversion, at Dillon, that if the Green Mountain Reservoir is senior in right and priority to Denver's Blue River project, Denver could have no water from the Dillon site, or through its tunnel, through the Dillon tunnel, the Montezuma tunnel. On the other hand, if Denver is senior in time and priority to the Green Mountain Reservoir, then Denver is not interfered with by the Green Mountain Reservoir.

Senator WATKINS. That is in court.

Mr. SAUNDERS. That matter is in two courts. The district court at Breckenridge, Colo., lying up the Blue from Dillon, decided that Denver had a junior priority, a rather late priority, in the 1940's. In that suit, the United States Government first appeared to adjudicate its Green Mountain Reservoir rights. Later, the United States Government withdrew from that suit and entered a suit in the United States district court at Denver. We proceeded to adjudication at Breckenridge, and Denver got this 1946 date at Breckenridge.

We know that as a matter of fact Green Mountain Reservoir is entitled to an earlier priority than that, but the city and county of Denver seeks a 1921 priority for its Blue River diversion. That is pending in the Supreme Court of Colorado.

If that were determined favorably to Denver, it would strengthen Denver's position materially, of course. But this same issue is now

pending in the United States district court at Denver, in which the United States has sued Denver and the Colorado-Big Thompson District and many others.

Senator WATKINS. Has the case been tried?

Mr. SAUNDERS. It is at issue but not yet tried. The United States district court at Denver, apparently preferring to try that case after the decision by the Supreme Court of Colorado, because there are matters of law involved in the supreme court case in Colorado, which the United States district court at Denver wishes to have the benefit before proceeding with this case.

The judge has so announced. Therefore, the whole question is up in the air as to whether or not Denver can get any water from the Blue River project if this litigation should be adverse to the city of Denver.

Thus, then, the United States Government is in a position to resolve, as a matter of business, if it chooses, the matter of the priority of the Green Mountain Reservoir in this matter.

The thing that Denver really most needs, so far as this matter is concerned, from legislation by this Congress, is that authority be given to the executive branch of the United States Government, to sell to Denver at the value to the Government and to the Colorado-Big Thompson project, the interference between the Blue River project and the Green Mountain Reservoir.

Senator WATKINS. I thought what you needed most was the \$75 million loan.

Mr. SAUNDERS. I am going to get to that in just a minute. As a matter of fact, I don't think you want to loan us \$75 million without resolving this other thing first, because we wouldn't be able to pay you back the money without resolving this water conflict.

Senator WATKINS. I make that comment because you said the thing you needed the most was some determination or legislative determination, I assume.

Mr. SAUNDERS. Yes.

Senator WATKINS. What we need most of all after we get the water and a few other things is the money with which to build it.

Mr. SAUNDERS. That is right. But we couldn't conscientiously ask you for the money if we didn't have the water after we spent the money. That wouldn't be right.

Senator WATKINS. Is that the only obstacle you have in the way?

Mr. SAUNDERS. That is one obstacle, and the other obstacle is the matter of the land necessary, the land of the United States, necessary to construct the Two Forks Reservoir.

Senator WATKINS. That can be bought, can it not?

Mr. SAUNDERS. We have tried for a great many years to acquire from the United States Government the land we need in the Two Forks Reservoir. We have worked up a forest exchange, and nothing happens to it, because there are certain lands in that reservoir that we can't seem to find a way, under the current status of the United States, to acquire.

Senator WATKINS. What kind of land is it? Is it privately owned?

Mr. SAUNDERS. No, Government land. The privately owned land we can condemn, and much of the privately owned land we have

bought. But we cannot condemn again the United States Government.

Senator WATKINS. What is the nature of that land that makes it difficult? Why can't you negotiate with the United States and get it?

Mr. SAUNDERS. I believe that the reason is that the United States has felt that the Blue River-South Platte project, being investigated by the United States Bureau of Reclamation, needed to store water at the Two Forks Reservoir site, and therefore the site should not be released to the city of Denver, for fear of an interference with the United States Government.

But it is our proposal—

Senator WATKINS. Do you mean the land up in this area over here [indicating]?

Mr. SAUNDERS. No, the land needed is down here in the Two Forks Reservoir. That is where we need the land, in the Two Forks Reservoir site. And the Bureau of Reclamation is designing a project which requires the use of this same site for storage of water. If the land is traded to us outright and without any strings, as is provided by present law, the Department of the Interior has felt that they would then perhaps be excluded from the use of the site.

Senator WATKINS. What is the United States using the lands for?

Mr. SAUNDERS. Nothing.

Senator WATKINS. Is it forest land?

Mr. SAUNDERS. It is forest land, largely.

Senator WATKINS. Is it covered with trees?

Mr. SAUNDERS. There are some skinny trees on it. It is not very well forested. What we would like is the authority to acquire this land, not under the terms of the present statutes where we get complete and outright control of the land exclusively, but under terms such that the United States Government can withhold from us sufficient title so that the Government itself may concurrently use this land along with us for reservoir purposes.

Senator WATKINS. You mean joint use?

Mr. SAUNDERS. A joint use. And the men that I have talked to, both legal and engineering in the Department of the Interior, say that the present law does not provide for this kind of a joint use.

Senator WATKINS. If it is possible for you to go in with the United States on this deal, why aren't you asking the Congress now for permission to come in under the regular reclamation law? Why aren't you asking authority to come in in such a way that your water needs could be taken care of by building this Two Forks Reservoir which the United States itself may build for some other project, and have it enlarged to the point where you both can be taken care of?

Mr. SAUNDERS. I am not sure that I have the question exactly. But as I understand, is the Senator suggesting—

Senator WATKINS. I am not suggesting. I am trying to find out what you want to do. You say that the United States probably wants to use this for their reservoir land.

Mr. SAUNDERS. Yes; that is right.

Senator WATKINS. And you say there is plenty of room there?

Mr. SAUNDERS. Enough capacity for both; yes, sir.

Senator WATKINS. I ask you now why you are not urging that you go into that project jointly with the United States instead of trying to buy the land.

Mr. SAUNDERS. That, in effect, is what we are asking in this bill, Senator. We are asking authority to buy the interests we need, subject to the requirements of the United States. And under existing laws we feel that we do not have that right, that either the United States must make an outright trade, so far as the forest land is concerned with us—we have land to trade with the United States for this land, so that the United States would get title to certain lands that we have and we would get complete title to certain lands in Two Forks Reservoir.

That would not give assurance that at some time later the United States could get back the interests that it needs. Therefore, under this legislation we would like to see as a part of the Colorado River storage project, an authority given to the executive department of the United States to convey to Denver for the full value the interest in this land that we need without jeopardizing the use of the land by the United States.

Senator WATKINS. Do they still insist on getting the loan from the United States for \$75 million? Do you propose that as an amendment to this bill?

Mr. SAUNDERS. Yes. We can get this right-of-way, and we can also have provisions in the bill such that we can buy from the United States the value of the use of the water at Green Mountain Reservoir for generating hydroelectric energy. That will then clear the financial picture so that we know this project is feasible. Having cleared that, we would then ask the United States Government for a loan for \$75 million to be repaid with interest, except that we would also ask that the loan be interest-free during the period of construction.

Senator WATKINS. I am wondering, after looking at this book and hearing the glowing terms from the young man who was secretary of the chamber of commerce, why Denver would have to come in and borrow money from the United States. It looks like the United States could better borrow money from Denver.

Mr. SAUNDERS. From a strictly dollars and cents financial standpoint, Senator, we are going to have some witnesses here who will show financial situation of this picture. Frankly, I believe, if I know what their testimony is going to be, that they will demonstrate that if Denver got the right-of-way for the Two Forks Reservoir, and also got the right to pay for the interference it might give to the Green Mountain power priority, Denver could, with private financing, afford to finance the Blue River project with private resources.

But we believe that it is a proper appeal to the discretion of the Legislature of the United States to ask for this interest-free period of construction for this reason: Denver in supplying the area outside the city limits is supplying an area which it cannot tax, which it cannot bond.

Senator WATKINS. Do you mean the Government installations?

Mr. SAUNDERS. No. There are outside over a hundred thousand people, private individuals, as well as the Government installations. These people are not in a position to help pay for this project, this Blue River project, during construction.

Senator WATKINS. Why do you not annex them so you can tax them, or charge them enough for the water so you can get it the other way?

Mr. SAUNDERS. Until we get the tunnel holed through, we have no water to sell them.

Senator WATKINS. Who is serving them now?

Mr. SAUNDERS. We are serving them now. But for the additional areas that are to be served, we just haven't any water at the present time. What Denver has done is to draw a line encompassing 125 square miles around the city. We feel that we have enough water from the Platte, the Moffatt, and the Williams Fork to supply that 125 square miles. We will not sell any water outside that area until we have the Blue River water nailed down, because it is the policy of the board of water commissioners, which has the right to cut off anyone outside at any time it needs the water inside, to maintain a sufficient surplus so that it will never have to cut off anybody outside once it has started to serve them.

It would be a terrible thing for us to cut off these thousands of people who have invested their money in their homes and say, "You have no water supply."

It is just so inhuman and so unthinkable that the board of water commissioners conducts policies on the basis that it is going to endeavor to maintain such a reserve that it can continue to serve them, unless we have a drought beyond which our imaginations have not gone.

Senator WATKINS. You are asking us to set a precedent for an outright loan in our reclamation bill, to a municipality.

Mr. SAUNDERS. So far as precedent is concerned, Senator, we believe there are precedents for this matter.

Now, without encumbering this record, I would like at this time to offer the written statement which I have prepared and which contains a statement of what we consider to be adequate precedents for such a procedure as this.

If the Senator will consent, I will submit this so that these precedents may be examined by the committee.

Senator WATKINS. Let me see it.

You submit to the committee a statement by Glen G. Saunders, attorney for the Board of Water Commissioners of Denver, Colo. That was the statement you prepared and it has in it the precedents you mentioned?

Mr. SAUNDERS. Yes, sir.

Senator WATKINS. It will be received as a part of the record.

(Mr. Saunders' statement follows:)

STATEMENT OF GLEN G. SAUNDERS, ATTORNEY FOR THE BOARD OF
WATER COMMISSIONERS OF DENVER, COLO.

The Upper Colorado River Commission, on January 17, 1954, unanimously adopted a resolution to the effect that the Colorado River storage project bill should be revised to include:

3. The Denver-Blue River diversion as a participating project provided that, before any money shall be appropriated for or applied thereto, the Secretary of the Interior and the Congress shall have approved the Denver plan and the method of repayment proposed by Denver.

Mr. John Geoffrey Will, the Upper Colorado River Commission's secretary and general counsel, then filed with the House Committee on Interior and Insular Affairs a letter suggesting several amendments to the House bill, one such amendment authorizing Denver's project. Since the Senate bill omits the Denver project, the Upper

Colorado River Commission has made available, for your consideration, the same amendment. This amendment, in general, provides for a loan of \$75 million to Denver to build its Blue River project for the purpose of supplying the Denver metropolitan area with water for municipal uses. The bill provides that the loan shall be paid back in 50 equal annual installments at the going rate of interest commencing on completion of the project.

Denver is no recent comer to the Colorado River headwaters. On page 105 of the booklet Working Denver is a map of the Denver municipal water system. Historically, Denver's supply came from the South Platte Valley which is located on the eastern side of the Continental Divide. The water was delivered to the population by the Denver Union Water Co. In 1918 Denver purchased the company's water system and the water board immediately started plans for a transmountain diversion system from the headwaters of the Colorado River to provide a new source of water for Denver's rapidly growing population. This Continental Divide diversion system consists of three units:

1. Fraser River diversion project: This project, which is also known as the Moffat tunnel project, collects water from the headwaters of the Fraser River, transports the water through the Moffat water tunnel to South Boulder Creek. The water flows down this creek to be impounded in reservoir No. 22, which will be completed in 1954, and then is used in Denver.

2. Williams Fork diversion project: This project, also known as Jones Pass tunnel project, collects water from the Williams Fork River, transports the water through Jones Pass tunnel, and delivers it to Clear Creek for use by Denver.

3. Blue River diversion project: This project consists of a 72,000-acre-foot reservoir at Dillon, Colo., which will catch the water occurring above Dillon. The water will be transported through the 23-mile Montezuma tunnel and delivered into the North Fork of the South Platte River. The water will flow down the North Fork to the junction of the North Fork and South Fork of the South Platte River to a reservoir site known as Two Forks where a reservoir and powerplant will be built. Hydro plants will generate electricity from the water as it passes through the system.

Denver early brought these plans to the attention of the Colorado River Basin States and the Bureau of Reclamation. On March 31, 1922, Denver presented a "Memorandum to the Colorado River Commission regarding Denver's need of water supply from the Colorado River Basin." The Colorado River Commission had received earlier, statements of Denver's program from Colorado's State engineer. It was upon this showing by Denver, and similar showings by other interested parties together with engineering considerations, which led to the division in the Colorado River compact allocating 7,500,000 acre-feet of water at the upper basin States. Similarly, at the time of negotiation of the upper basin compact, Denver presented its program to the Upper Basin Compact Commission and Colorado's division 51 percent of the upper basin water was, in part, based on Denver showing.

Reference is made to the exhibit entitled "Denver's Water Requirements." At the present time and for the last several years, the trend

of Denver's water requirements has been increasing at the rate of 24 percent each 10 years. The broken ascending line on the chart indicates this trend. On the right-hand side of the chart are cross-hatched blocks indicating the average yield of water from Denver's various sources. In an average year, the South Platte River yields Denver 77,000 acre-feet. In an average year, the Moffat tunnel system yields Denver 80,000 acre-feet. The first Moffat tunnel water was delivered to Denver in 1936 and in the next 5 years Denver will complete the last elements of its Moffat tunnel unit. The 80,000 acre-foot average assumes completion of all elements of the project. The Williams Fork unit, which delivered its first water to Denver in 1940, when complete will yield 16,000 acre-feet of water in an average year.

The present sources of Denver water, namely, the South Platte, Moffat tunnel, and Williams Fork sources, in an average year, when completed will yield 173,000 acre-feet of water.

The chart shows that by 1963 Denver will need Blue River water, assuming other sources yield average supplies. These sources do not always yield average supplies. This summer Denver is rationing water. A continuation of drought condition will mean a continuation of rationing and increasing severity of rationing restrictions. Since it will take 6 to 8 years to build the tunnel, it is imperative for Denver to start the project immediately. Once the tunnel is built, sufficient water can be delivered to satisfy Denver's requirements while the other units are being completed in order to bring the project up to its maximum water production.

It should be noted that in 1936 Denver obtained \$100,000 of PWA money for the Bureau of Reclamation to make a study of a larger Blue River-South Platte project to supply irrigation and domestic water. Later, Denver obtained an additional \$75,000 for the Bureau, and for 15 years has been cooperating with the Bureau in making joint studies of the Blue River-South Platte project. These studies resulted in a 450,000 acre-foot project making use of a much larger reservoir at Dillon, the same tunnel, and a larger Two Forks Reservoir. The study demonstrated that the Blue River-South Platte project is not economically feasible within present standards and is therefore not available to meet the current and immediate need.

In 1943 the Federal Power Commission, by its first form withdrawal withdrew the Two Forks Reservoir site from use by the public and held it for future power development. The Denver project will develop power at this reservoir site and one thing that Denver seeks by this legislation is clearance of right-of-way for a reservoir at this site.

It is noted that when Denver's Blue River project has been built at Denver's expense, it can provide the core of the larger Blue River-South Platte project and can substantially aid the feasibility of the larger Federal project.

Denver submits that the full development of the upper Colorado River basin will be greatly advanced by an amendment to the storage project bill to provide that the United States shall loan Denver \$75 million to build its Blue River project. This project includes a 72,000 acre-foot reservoir at Dillon, Colo., which will catch water from the Blue River, a tributary of the Colorado River, a 23-mile transmountain tunnel known as the Montezuma tunnel to carry this

water from the western side of the Continental Divide, and a reservoir at Two Forks (southeast of Denver) on the South Platte River to impound such water together with the hydroelectric plant at Two Forks to use Blue River water and South Platte water to generate electricity for use in the Denver area.

The provisions with respect to the construction loan may be summarized as follows:

(a) Over a maximum period of 15 years, the United States will advance funds just ahead of their need for construction.

(b) Moneys advanced for each unit will be interest free until the unit itself is completed. On completion of each unit the loan, with respect to the unit in question, becomes immediately repayable, or, at Denver's option, may be repaid in 50 equal annual installments plus interest at the going rate for long-term Federal money. Net revenues of the water plant and taxes levied on all taxable property in Denver are to be made available to discharge Denver's obligations.

Next following is a flow chart to show the probable chronological schedule of construction and a rate of investment table based on the flow chart.

**CITY AND COUNTY OF DENVER
CONSTRUCTION FLOW CHART
BLUE RIVER PROJECT**

UNIT	1955	56	57	58	59	1960	61	62	63	64	1965	66	67	68	69	
MONTEZUMA TUNNEL			\$ 35,000,000													
TWO FORKS RESERVOIR										\$ 25,000,000						
TWO FORKS HYDRO PLANT												\$ 3,000,000				
CHANNEL IMPROVEMENTS SOUTH PLATTE RIVER							\$ 1,500,000									
DILLON RESERVOIR											\$ 10,500,000					

City and county of Denver, anticipated rate of advances, Blue River project

Year	Montezuma tunnel	Two Forks Reservoir	Channel improvement and hydro plant	Dillion Reservoir	Total	Cumulative total	Value of advances at 3 percent interest
1955	\$4,375,000				\$4,375,000	\$4,375,000	\$131,250
1956	4,375,000				4,375,000	8,750,000	262,500
1957	4,375,000				4,375,000	13,125,000	393,750
1958	4,375,000				4,375,000	17,500,000	525,000
1959	4,375,000				4,375,000	21,875,000	656,250
1960	4,375,000				4,375,000	26,250,000	787,500
1961	4,375,000		¹ \$750,000		5,125,000	31,375,000	941,250
1962	4,375,000		¹ 750,000		5,125,000	36,500,000	1,095,000
1963		\$4,166,667			4,166,667	40,666,667	125,000
1964		4,166,667			4,166,667	44,833,334	250,000
1965		4,166,667		\$2,625,000	6,791,667	51,625,001	453,750
1966		4,166,667	² 1,000,000	2,625,000	7,791,667	59,416,668	687,500
1967		4,166,667	² 1,000,000	2,625,000	7,791,667	67,208,335	921,250
1968		4,166,665	² 1,000,000	2,625,000	7,791,665	75,000,000	1,155,000
Total	35,000,000	25,000,000	4,500,000	10,500,000	75,000,000	75,000,000	8,385,000

¹ Channel improvement.
² Hydro plant.

The factual justification for the loan may be summarized as follows:
 1. Diversion of a maximum of 177,000 acre-feet of water into the Denver water system will result in return flow to the South Platte River through Denver sewers of 140,000 acre-feet of water per year. If reservoirs are built to catch and hold this return flow for release during the irrigating season, more than 50,000 acres of what is now dry, unproductive land northeast of Denver can be irrigated, and the annual benefits thereby derived, computed in the same manner as those reported for H. R. 236 (Fryingpan-Arkansas project), are as follows:

Direct benefits each year	\$1,330,000
Indirect benefits each year	2,296,000
Total	3,626,000
Total benefits over 50-year repayment period	181,300,000

If no reservoirs are built, only the return flow to the river during the irrigating season could be used beneficially. Under these circumstances, only 21,000 additional acres could be irrigated and the annual benefits would be:

Direct benefits each year	\$558,600
Indirect benefits each year	964,300
Total	1,522,900
Total benefits over 50-year repayment period	76,145,000

2. Denver is known as the second capital of the United States. The population of metropolitan Denver, 650,000 includes 19,500 nonmilitary Federal employees and 16,500 military personnel and approximately 70,000 dependents of such employees and personnel. This group of more than 100,000 people represents a very substantial segment of Denver population for which Denver performs all municipal services without benefit of a corresponding industrial tax base, the most prolific source of revenue to meet the costs of government. The new West Point of the Air may increase these figures.

3. The Denver Water Board supplies water, not only to the area within the political limits of Denver, but also to almost the entire metropolitan area around Denver. Within the political limits of Denver there is located \$36,902,000 of tax-exempt federally owned property. Had this property been taxed at the 1953 mill levy for

city purposes of 39.55 mills, the Federal Government would have paid Denver \$145,947.41 in taxes.

4. Denver has a split water rate, one rate applying to Denver citizens who have invested almost \$70 million in their water plant, and the other, a higher rate, applying to users outside the city who have not made such investment. However, the city grants to Federal Government installations outside the city cheaper, inside rates in almost all cases. The next following table shows for the year 1953 the water revenue from Federal Government installations located outside the city and losses of revenue (\$82,433.19) to the city by reason of the favorable rates:

City and county of Denver loss of revenue from Government installations outside of Denver, 1953

Federal installations	Consumption— thousand gallons	Actual		Normal rate schedule		Loss from service to Federal installa- tions
		Rate per thousand gallons	Revenue	Rate per thousand gallons	Revenue	
Rocky Mountain Arsenal.....	409,449	\$0.106	\$43,523.83	\$0.203	\$83,107.30	\$39,583.47
Fort Logan Hospital and housing project.....	46,189	.135	6,245.73	.233	10,781.29	4,535.56
Federal Correctional Institution..	44,096	.130	5,711.04	.223	9,836.64	4,125.60
Fitzsimons Army Hospital.....	361,739	.110	39,926.99	.205	74,115.55	34,188.56
Lowry Air Force Base (partly inside and partly outside of city).....	573,338	.104	60,320.96	.104	60,320.96	-----
Federal center.....	168,490	.213	35,967.40	.213	35,967.40	-----
Rocky Flats Atomic Plant (un- filtered water).....	63,562	.108	6,878.96	.108	6,878.96	-----
Total.....	1,671,853	.119	198,574.91	.168	281,008.10	82,433.19

COMMENT

Denver is requesting a construction loan of \$75 million for a necessary, worthwhile, and justifiable project with repayments to be made on a sound business basis. Denver's only request, which might be called a subsidy, is that the money be interest free during the construction period until the various units of the project go into operation. Generally, money advanced by the Federal Government for projects of this type, is interest free during the construction period. During this 15-year construction period, the Federal Government will receive from Denver:

Tax free use of land and improvements.....	\$2,190,000
Bargain water rates.....	1,237,000
Total.....	3,427,000

Based on present water rates and the present tax structure, during the 50-year payout period, the United States will receive from Denver:

Tax free use of land and improvements.....	\$7,300,000
Bargain water rates.....	4,125,000
Total.....	11,425,000

In addition, there will accrue to irrigation users in the South Platte Valley, without building any storage, during such 50-year period, values of \$76 million which in part will return to the Treasury in the form of income and other tax collections. Reservoir construction of a modest nature can increase this figure to \$180 million.

PRECEDENTS

The legislation which the city and county of Denver now seeks has ample precedent in similar laws enacted by Congress from time to time in the past to assist municipalities in the development of their waterworks, especially in situations where it is necessary for the municipality to go a long distance to obtain an adequate water supply for the expanding population and industry. Such assistance by Congress has been amply justified to aid in the development of commerce and trade within the country, for the public welfare, to permit the construction of defense projects at selected strategic locations, and to assist in the settlement of public lands in the surrounding area. The nature of this assistance has been in the form of loans and also in the form of grants and subsidies which meet a part of the cost of a project by recognizing secondary and incidental benefits of the project to the public in general, such as flood control and preservation of fish and wildlife.

The Defense Public Works Act (42 U. S. C. A. 1531 ff.), provides in part:

SEC. 1531. *Declaration of policy; definition of "public work."*—It is declared to be the policy of this subchapter to provide means by which public works may be acquired, maintained, and operated in the areas described in section 1532 of this title. As used in this subchapter, the term "public work" means any facility necessary for carrying on community life substantially expanded by the national-defense program, but the activities authorized under this subchapter shall be devoted primarily to schools, waterworks, sewers, sewage, garbage and refuse disposal facilities, public sanitary facilities, works for the treatment and purification of water, hospitals and other places for the care of the sick, recreational facilities and streets and access roads.

Sec. 1532. (c) To make loans or grants, or both, to public and private agencies for public works and equipment therefor, and to make contributions to public or private agencies for the maintenance and operation of public works, upon such terms and in such amounts as the Administrator may consider to be in the public interest. * * *

Sec. 1533. (3) Public works shall be maintained and operated by officers and employees of the United States only if and to the extent that local public and private agencies are, in the opinion of the Administrator, unable or unwilling to maintain or operate such public works adequately with their own personnel and under loans or grants authorized by this subchapter.

The provisions above quoted terminated 6 months after the end of the national emergency.

Let us consider the water problem of the city of San Diego. In 1947 a conduit from the aqueduct of the Los Angeles Metropolitan Water District was completed to supply the city with a flow of 85 cubic feet per second. This unit was planned by the Bureau of Reclamation and built by the Navy with the city to repay the cost, approximately \$15 million, over a 40-year period. However, the needs of the city expanded so rapidly that the 82d Congress, 1st session, authorized (Public Law 171) the Secretary of the Navy to build a second conduit. The assistance was justified, House Report 907 of the 82d Congress, on the grounds that San Diego had grown in population, had a large aircraft industry, a large naval establishment, and a limited water supply. The cost of this second conduit is to be repaid by the city over a 40-year period.

Denver likewise has grown rapidly in population, has a large military establishment and important national defense industry including one installation of the Atomic Energy Commission.

Another group of analogous laws is found in the statutes on public lands which created the Bureau of Reclamation. The Bureau is authorized to furnish water to municipalities (43 U. S. C. 485h (c)), providing:

The Secretary is authorized to enter into contracts to furnish water for municipal water supply or miscellaneous purposes: *Provided*, That any such contract either (1) shall require repayment to the United States, over a period of not to exceed 40 years from the year in which water is first delivered for the use of the contracting party, with interest not exceeding the rate of 3½ percent per annum *if the Secretary determines an interest charge to be proper*, * * *. [Emphasis supplied.]

Denver's request that it not be charged interest until the development period has expired, finds ample precedent in section 485h (d) where it is stated:

(3) That the general repayment obligation of the organization shall be spread in annual installments, of the number and amounts fixed by the Secretary over a period not exceeding forty years, exclusive of any development period fixed under subsection (d) (1) of this section, for any project contract unit, or for any irrigation block, if the project contract unit be divided into two or more irrigation blocks.

(4) That the first annual installment for any project contract unit, or for any irrigation block, as the case may be, shall accrue, on the date fixed by the Secretary, in the year after the last year of the development period or, if there be no development period, in the calendar year after the Secretary announces that the construction contemplated in the repayment contract is substantially completed or is advanced to a point where delivery of water can be made to substantially all of the lands in said unit or block to be irrigated; and if there be no development period fixed, that prior to and including the year in which the Secretary makes said announcement water shall be delivered only on the toll charge basis hereinbefore provided for development periods.

To aid commerce and trade, the Reconstruction Finance Corporation was created. Under such a law, Denver would be eligible for the loan. That law (15 U. S. C. A. 604 (3)) provided:

In order to aid in financing projects authorized under Federal, State, or municipal law, to purchase the securities and obligations of, or to make loans to, (A) States, municipalities, and political subdivisions of States, (b) public agencies and instrumentalities of one or more States, municipalities, and political subdivisions of States, and (C) public corporations, boards and commissions: *Provided*, That no such purchase or loan shall be made for payment of ordinary governmental or nonproject operating expenses as distinguished from purchases and loans to aid in financing specific public projects.

Restrictions were placed upon such loans. The obligations purchased were required to be of sound value and secured, and not exceed \$200 million. Interest rates were determined by the Secretary of the Treasury (15 U. S. C. A. 606). If the RFC were still active, Denver would qualify for the loan from such agency.

In hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, House of Representatives, 82d Congress, held May 18, 21, and 22, 1951, Mr. D'Ewart pointed out at page 32 that the State of Montana has a water board which issues bonds and builds irrigation projects, financing such bonds through RFC or through the various agencies for that purpose. He also pointed out that this board had irrigated more acres in the State of Montana, through such projects, than through Bureau of Reclamation projects.

A number of projects supplying municipal water in part have been built under this law. For example, the Canadian River project in

Texas, which specifically is authorized under 43 United States Code Annotated 600b and 600c, supplies primarily municipal and industrial water, and also water for irrigation, flood control, fish and wildlife, and facilities for silt retainment. The cost allocable to flood control and fish and wildlife is nonreimbursable. The repayment period is 50 years from the date of completion of the municipal and industrial features, the interest rate is the same as the rate paid by the United States on long-term bonds, and title to the municipal features will pass to the municipalities when payment is completed.

Use of money to build a project, interest free until the project is completed and operating, is a subsidy. The reclamation laws, the Defense Public Works Act, and other laws give ample precedent for this type of subsidy. In addition, subsidies are given in the form of nonreimbursable expenditures when the project produces incidental benefits to the general public such as flood control, preservation of fish and wildlife, and sometimes silt control. Two Forks Reservoir can be used for flood-control purposes and for the preservation of fish and wildlife, and return flow from Denver sewers will benefit downstream lands. The United States contributed \$4 million or \$5 million to San Francisco for flood-control benefits incidental to the construction of its Cherry Valley project, a part of its municipal water system (hearings before Subcommittee on Irrigation and Reclamation, May 18, 21, and 22, 1951, 1st sess., 82d Cong., p. 33).

Mr. SAUNDERS. I would like to emphasize one thing particularly with respect to our request that this bill contain such language as will permit us to pay for the conflict between our diversions and the diversions for hydroelectric energy at Green Mountain.

Senator WATKINS. What will it do if you buy that power?

Mr. SAUNDERS. If we were to buy that power, it would, in effect, completely recompense the United States Government for any loss which it might suffer by reason of our diverting water upstream and away from the Green Mountain powerplant.

Senator WATKINS. What will it do to anyone else? Is anyone else involved other than the United States?

Mr. SAUNDERS. No one else will be involved, provided we leave the storage of 150,000 acre-feet at Green Mountain intact, and we do not propose to buy that storage. That was built for the use of the people of western Colorado, and we do not believe that we should ask to interfere with that storage, and we do not ask for that.

Senator WATKINS. What you are attempting to buy, then, is the nonconsumptive right?

Mr. SAUNDERS. Yes, sir.

Senator WATKINS. And that is the power?

Mr. SAUNDERS. Yes, sir. And that nonconsumptive right was referred to in the President's recommendations which Senator Millikin offered here as the first item in your exhibits, being the recommendations of March 20, 1954. I refer particularly in that to the H. R. 4449, the reprint No. 1774, at page 23, lines 22 and following, in which the principle is recommended by the President and it is exactly the principle that the 4 upper basin States agreed upon, that no downstream power use should ever interfere with or impair upstream consumptive uses.

This is strictly in accord with the 1922 Colorado compact and the upper basin compact, both of which provide that uses of water for

hydroelectric generation shall always be inferior and subordinate to uses for agriculture, and domestic consumptive uses.

Senator WATKINS. That is not the law of Colorado, is it?

Mr. SAUNDERS. The law of Colorado makes the same preference, but it requires the preferred user to pay in full for the inferior use. And since the United States Government cannot be sued by the State of Colorado or by the city and county of Denver, we are not in a position to acquire by condemnation this right at Green Mountain Reservoir.

Senator WATKINS. If this were a private party that owned this reservoir, if it were someone other than the Government that you could sue, then you would institute condemnation proceedings if you couldn't buy it?

Mr. SAUNDERS. If we couldn't negotiate a purchase price, we could acquire it by condemnation, and we seek nothing in this bill that we couldn't acquire from a private party by condemnation. But since we cannot sue the Government, we seek authority from the Government for the executive branch to negotiate with us that price. We think we will not have trouble with that price, if we are given that power, because the Bureau of Reclamation in its own statements and analyses has clearly defined the value of that power.

Mr. Moseley, who follows me, will explain that more clearly.

Senator WATKINS. Just for my information, this land you want to buy, is that connected with any reclamation project at the present time?

I am not acquainted with the reclamation projects over there very well.

Mr. SAUNDERS. The Green Mountain Reservoir was built as a part of the Colorado-Big Thompson project, but the director of the region has informed us, informed both Mr. Moseley, the manager of the water department and Mr. Crawford, the director of the Colorado Conservation Board, that the revenues of this project are going directly to the General Treasury of the United States and not to the Big Thompson project. Therefore, we assume there is nobody else interested other than the United States in the profits of this electrical energy.

Senator WATKINS. Has the entire cost of the Green Mountain Reservoir been repaid?

Mr. SAUNDERS. Not yet. But it will have been amortized completely before we can complete the Blue River tunnel.

Senator WATKINS. You of course will not need that water until that time?

Mr. SAUNDERS. That is correct. And even after we have completed the tunnel, we will not need to acquire all of the conflict, if one exists, because at first we will not use the entire flow of water. We can only divert so much as we can put to beneficial use.

Senator WATKINS. Have you an idea of the value of this right you would like to acquire?

Mr. SAUNDERS. \$1.35 an acre-foot, I believe. Mr. Moseley has the details on that figure.

Senator WATKINS. Is that what it would sell for on the market, or is that the cost of it?

Mr. SAUNDERS. I understand that is the value on the market.

Senator WATKINS. As I remember, you said that if the city of Denver had this power water right and could get this land for the

Two Forks Reservoir down on the south Platte, it probably could arrange to finance this diversion by itself; is that right?

Mr. SAUNDERS. That is my personal opinion, that the project would be so sound, financially, that Denver could finance it itself if it had the Green Mountain Reservoir conflict taken care of and the right-of-way.

Senator WATKINS. What about the city of Denver? Does it have the same view as you have?

Mr. SAUNDERS. The city of Denver is sitting on my left and I think it does. Mr. Petry is the city of Denver because he is the president of the Board of Water Commissioners, which has all the powers of Denver affecting its plans.

Senator WATKINS. The committee would like to know officially whether the city of Denver has the same view.

Mr. SAUNDERS. I wish Mr. Petry would express it.

Mr. PETRY. Senator, I believe that as president of the Denver Water Board, I can answer in the affirmative to that question.

Senator WATKINS. You would be able to finance it?

Mr. PETRY. Yes, sir.

Senator WATKINS. I assume a city the size of Denver probably could borrow enough money to do that.

Mr. PETRY. The question cannot be answered officially without a vote of the people. It would have to be presented to the citizens of Denver for a vote, through a bond issue, but it would be merely my opinion, and I would recommend the sale to the citizens of Denver, as president of the Denver Water Board.

Senator WATKINS. I am not making a commitment as far as I am concerned, nor as far as the committee is concerned. I cannot commit the committee. But I would say that the suggestion ought to be before the committee for consideration, whether they want to do it or not, and whether they want to consider the first applications made with respect to a loan, or whether they want to leave it out entirely.

Mr. PETRY. Bond issues that have been recommended before by the Denver Water Board to the citizens of Denver have never been voted down. They have always been voted in favor. We have expert testimony to follow that will produce evidence showing that this could be financed privately.

Senator WATKINS. I get the impression from what you said, Mr. Saunders, that there would be no possible damage to the United States, if you purchased this right, this power water right.

Mr. SAUNDERS. That is what we would propose, to fully reimburse the United States.

Senator WATKINS. Even though the cost may be more than you just mentioned?

Mr. SAUNDERS. Yes, sir. A note has been laid here that perhaps I have not made it clear that under our proposal, the stored waters of Green Mountain Reservoir would be fully available for downstream uses. We do not propose to buy anything except the power water, that is, the direct-flow power water.

Senator WATKINS. You ought to make clear why you have to have that.

Mr. SAUNDERS. The reason we have to have that is because if that right should turn out to be senior, and we don't wish this committee to enter into that litigation at all, that is up to the courts to decide, but

if it should be senior and the courts should decide that, we will have to abide by that decision, and if it is senior, then those power rights can command all the water at Dillon and require us to turn down at Dillon all the water to supply the hydroelectric plant at Green Mountain. That would completely destroy the possibility of Denver getting any water through the Montezuma tunnel out of the Blue River.

Senator WATKINS. You are asking this committee to approve a proposition whereby you will get waters from the Blue River to take over there. What you want fundamentally is water.

Mr. SAUNDERS. Yes, sir. And we wish to be able to compensate the United States to whatever extent our diversions interfere with priorities at Green Mountain hydro plant, so that by paying the United States the value of that water at the hydro plant, the water will be released to us from the hydro plant so that we can take it over to Denver for beneficial consumptive use.

Senator WATKINS. Do you have a filing with the State engineer from the water board?

Mr. SAUNDERS. Yes, sir; we have a filing and a conditional decree.

Senator WATKINS. That is now in dispute?

Mr. SAUNDERS. That is now in dispute by us, because we want an earlier date than the decree gives us.

Senator WATKINS. You have appealed from that decision?

Mr. SAUNDERS. Yes, sir.

Senator WATKINS. That is the one that is pending in the State court?

Mr. SAUNDERS. Yes, sir.

I believe that, as a result of the questioning of the Senator, I have only one other thing to do and that is to offer as an exhibit the material that is shown, Denver water requirements that I have been referring to, and I offer the 15 copies, required by the committee for the committee members, of that exhibit, Denver water requirements.

Senator WATKINS. That will be received and filed with the committee.

Does that cover your statement?

Mr. SAUNDERS. Yes, sir.

Mr. PETRY. The next witness is Mr. Earl Mosley, secretary-manager of the Denver Water Board, civil engineer of wide experience, and manager of the board since 1950.

Mr. Mosley.

STATEMENT OF E. L. MOSLEY, MANAGER, DENVER BOARD OF WATER COMMISSIONERS, DENVER, COLO.

Mr. MOSLEY. Mr. Chairman, 43 out of each 100 people in Colorado live in the Denver metropolitan area. This urban population represents about 19 percent of the total number of inhabitants making their homes in the 4 upper Colorado River Basin States of Colorado, New Mexico, Utah, and Wyoming.

Denver proper is the center of one of the fastest-growing metropolitan areas in the West, the average annual increase in population since the 1950 census having been approximately 24,000. The population increase for the city and county of Denver alone for the decade 1940 to 1950 was 29 percent, as compared with 18 percent for the State and 14.5 percent for the continental United States as a whole.

Furnishing an adequate supply of potable water for domestic, commercial, industrial, and military uses to more than 660,000 Denver area residents is, at this time, largely the responsibility of the Board of Water Commissioners for the City and County of Denver.

Recognizing the many problems connected with this responsibility, the board has, in the past 8 years, expanded its water plant at a cost of more than \$29 million.

A 10-year program of additions and betterments to the Denver water system, exclusive of the Blue River unit, was begun in 1953 and is now going forward on schedule. The cost of these improvements, when completed in 1963, is estimated at \$40 million.

This work will complete the development of all available sources of raw water supply except that to be taken from the Blue River.

The annual increments to be added to plant under this program have been assigned priorities so that supply will be kept in step with demand, if the assumption proves to be correct that the past 8-year rate of growth will continue without appreciable change for the coming 9 years.

Since this program is, at best, the result of short-time planning, it is obvious that work on facilities referred to by Mr. Saunders for the additional water supply needed after 1963 must be commenced at an early date if normal community growth is to continue without hindrance beyond the next 9 years.

The Denver Blue River unit consists of a water diversion in substantial amount from the Blue River at a point below the junction of its three main sources at Dillion. The water so diverted will be conveyed from the western to the eastern side of the Continental Divide through a 23-mile tunnel having its eastern portal near the town of Grant on the North Fork of the South Platte River. That is the tunnel that has been named Montezuma.

After leaving the tunnel at Grant, it will be transported in the natural stream bed of the North Fork of the South Platte River to its junction with the South Fork of that river and thence through existing facilities into the present Denver water system. Provision has been made for storage facilities at Dillon and at the Two Forks Reservoir site located on the South Platte River about 26 miles southwest of Denver.

The estimated cost of the completed project computed at 1953 prices is \$75 million with storage capacities of 83,000 and 200,000 acre-feet provided at Dillon and Two Forks, respectively.

Both of these locations offer sites capable of substantial increases in storage capacity at favorable unit costs per acre-foot that can be developed, when needed, in the future.

Auxiliary facilities, omitted from the above estimates of cost, include the cost of constructing a powerplant near Insmont below the east portal of the tunnel, a second plant located near the head of the Two Forks Reservoir Basin, and a third plant to be built on the downstream side of the dam creating that reservoir.

Noninclusion of these possible future hydroelectric powerplants in the project at this time stems from the fact that, at least in the early stages of this project, it is certain that the return realized from their construction and operation would not be sufficient to economically justify the capital costs involved.

This project was first initiated more than 30 years ago and since that time has occupied an important position in Denver's plans for the future.

In addition to the surveys, geological investigations, water filings and acquirement of lands needed for it, construction has been underway on the eastern end of the diversion tunnel since 1946. To date approximately 1½ miles of the full section tunnel have been excavated.

The project outlined herein contemplates a loan from the Federal Government. In considering such a loan, it should be kept in mind that—

1. The Denver water system is publicly owned and, as such, its properties are free from taxation of all kinds.

2. Under the terms of the city charter, the department has the power to raise capital funds through the issuance of general obligation bonds upon authorization by vote of the people.

Senator WATKINS. What you would do here is to give the Government bonds, is that what you mean?

Mr. MOSLEY. That might be one method, yes, sir.

3. No debt limit applies to waterworks bonds.

4. The board of water commissioners has authority by the Denver city charter to fix water rates in its sole and absolute discretion without utility commission control for users outside the city limits and limited only in the city by the provision that the rates shall be no higher than necessary for operation, maintenance, debt service, additions, extensions, and betterments.

5. The Federal Government, by reason of its heavy investment in defense and other activities located in the Denver area, has a substantial financial interest in seeing to it that adequate water supplies are made available for all present and future potential uses for itself as well as for the general public.

6. Pro forma statements have been prepared for the entire period of years during which present and proposed fixed charges as outlined above will constitute a first lien on operating revenues. These statements show that revenues earned, on the present scale of charges for water service, will be adequate to meet all such debt service requirements without in any way lowering existing operating and maintenance standards, or taking advantage of the tax levy provisions of the city charter.

If, for any reason, Federal financing is not either possible or, if possible, can only be obtained under terms not acceptable to the taxpayers of Denver, then the only remaining course for Denver to follow will be to finance the early phases of the project with private capital. This procedure might require the formation of a new type of governmental unit within the area, not desired by the people. Or it might result in extensive annexations to Denver, which the Denver Water Board has never thought should be forced upon its more or less unwilling neighbors.

In any event, the Montezuma tunnel occupies top construction priority. This unit of the program, estimated to cost approximately \$36 million, is the controlling physical feature of the entire project. It has to be completed before any water can be secured and offers no

opportunity for State construction. It will require the longest construction time, 6 to 8 years, and will be the most costly of all the units of the fully developed project.

In order to avoid other heavy construction costs during the early years of tunnel operation, it is proposed to defer the construction of storage facilities at Dillon until diversions at that point reach a volume that cannot be adequately taken care of by the low dam that will first be built there.

Likewise the initial stages of the project below the east portal of the tunnel will be limited to channel improvements needed to prevent damage to adjoining property when substantial quantities of water are being diverted in addition to the natural high flows generated in the stream itself. Storage facilities proposed at the Two Forks site will also be deferred until such time as annual diversions reach a sustained volume sufficiently large to justify the capital investment required.

It is estimated that the additional needs of the city for the first 8 years after completion of the tunnel will be fully met by a first expenditure of \$41 million on this project.

Since the current construction program, referred to above as having been started in 1953, cannot be financed entirely from surplus operating revenues and other funds now on hand, it will soon be necessary to ask the taxpayers of Denver for authority to issue general obligation bonds in the amount of \$24 million to assure the completion of this program. If, then, Federal financing for the Blue River unit cannot be provided, the \$41 million needed to finance the initial expenditures for that project will also have to be authorized by vote of the people, the total of the two necessary authorizations being \$65 million.

The one remaining possible conflict that might impose an additional burden on the operation of the Denver Blue unit has to do with the present use of Blue River water by the Department of the Interior for the generation of power at Green Mountain Reservoir, a part of the Colorado-Big Thompson project. This problem can be resolved in 1 of 2 ways: first, by Denver compensating the Department of the Interior for the loss of water used on an annual basis of about \$1.50 an acre-foot for all water diverted through the Montezuma tunnel, or, second, making a lump-sum payment which will offset the reduced power production potential of the Green Mountain powerplant. In either case, any required adjustment would not be important enough to substantially affect the feasibility of the project as a whole.

Once deliveries of water are assured by completion of the tunnel, sales will clearly guarantee repayment of all costs.

To illustrate—the value of raw water at \$29.20 an acre-foot is clearly established by the actual sales, at current rates charged and collected by the Board of Water Commissioners for inside city consumption. Outside Denver rates are still higher.

All calculations made on the cost of Blue River water, even in the early stages of unregulated flow when the unit cost is at a peak, do not exceed a maximum of \$28.20 an acre-foot. When fully developed, with complete regulation possible, our calculations show that the average cost will be not more than \$26 an acre-foot.

Thus it will be seen that the Government is assured of the return of money advanced to Denver for this project out of the sale of water

therefrom, quite apart from the security to be afforded by taxes on property which would be available in case of default in water sales.

Senator WATKINS. Will you explain who is now using the Green Mountain Reservoir water?

Mr. MOSLEY. The power by the Federal Government only, and the downstream senior appropriators have the storage of 152,000 acre-feet annually reserved for them, one filling a year.

Senator WATKINS. Is there any water there now that is not being consumptively used?

Mr. MOSLEY. I am not in position to say that. It is all being used for power, and of course it goes down the river.

Senator WATKINS. I am talking about consumptive use.

Mr. MOSLEY. I cannot say whether it is consumed in Colorado or farther down the stream. It bypasses the plant.

Senator WATKINS. Is the water you want to take through the tunnel into Denver being consumptively used by someone else?

Mr. MOSLEY. We are only interested in buying the power right.

Senator WATKINS. I can read the record later and clear that up. It is not quite clear to me now.

Have you finished?

Mr. MOSLEY. Yes, sir.

Senator WATKINS. Thank you very much.

Call your next witness.

Mr. PETRY. Mr. Paul M. Harrington, member of the city council.

Senator WATKINS. We will have to speed this up. We allotted an hour and a half to you people.

Mr. PETRY. We will speed it up.

Senator ANDERSON. I want to explain to the Denver people that I did not mean to stay away from their presentation. We were trying to report out the final version of an atomic energy bill. We have just reported it, after 6 solid weeks of work.

Mr. PETRY. Yes, that was explained, Senator. Thank you.

STATEMENT OF PAUL M. HARRINGTON, MEMBER, CITY COUNCIL, DENVER, COLO.

Mr. HARRINGTON. Mr. Chairman and members of the committee, I am here in support of S. 1555.

The Denver City Council has no control whatsoever over the operation of the Denver municipal water plant. Ordinarily the only contact the city council has with the water department is when it passes necessary legislation for bond ordinances which are to be backed by the credit of the city and county generally, as well as the revenues of the water department.

The governmental part of the city government is of necessity interested in the water department, because it controls the basic resource without which nothing else functions. Without the assurance of a water supply, the city would be completely helpless.

During the period of over a third of a century, during which the water department had been municipally owned, there has been complete harmony between that department and the Denver City Council, which is vitally interested in water department affairs because improper financing by the water department would tend to injure the general city credit, to the detriment of other departments.

In water development projects, the council in its deliberations and in its decisions follows a well-established pattern, namely: Is there a need for the project? Is it feasible? Is it practical? Will it produce economic benefits? And lastly, is it fundamentally sound?

Consequently, the city council has backed the water department in its long-term financing operations through public bonds, because experience has taught that the water department is careful, prudent, and economical. The fact that water has no price, but is an absolute necessity, has never deterred the water department from an attitude of frugality.

This has created a situation in which the people of Denver generally back the water department in its undertakings, unhesitatingly voting bonds when recommended by that department.

I know of no time that the people have ever stopped the water department.

The water board has always demonstrated the means by which it expected to pay out its bonded obligations through the sales of water, and has always made good on its promises.

The city council has never been called on to levy a tax to make good a water board obligation.

In the West, we have come to expect a partnership with the Federal Government in the development of water resources, and have had outstanding assistance from the Federal Government in this regard. The people of the Denver metropolitan area have full faith that the Federal Government stands ready to give hearty cooperation to the Denver area in assisting it in solving its water problems.

I thank you, Mr. Chairman.

Senator WATKINS. Thank you, Mr. Harrington.

Mr. PERRY. The next witness is Mr. Shulenburg, who is mayor of Arvada and vice president of the Colorado Municipal Association, which consists of the 10 cities surrounding Denver.

**STATEMENT OF H. M. SHULENBURG, MAYOR OF ARVADA, COLO.,
AND VICE PRESIDENT OF THE COLORADO MUNICIPAL ASSO-
CIATION**

Mayor SHULENBURG. Mr. Chairman and members of the committee, it is a privilege to appear before the committee in the interests of the area outside of and adjacent to Denver, the metropolitan area, and to support S. 1555.

With us, water has top priority because it is essential for the growth and development of our State as well as the entire Rocky Mountain area. A sufficient and adequate supply is necessary to take care of the ever-increasing population and industrial growth. Likewise, due to the trend of decentralization in industry and Government, as well as the importance of the problem of national defense, our water problem is of importance to the Federal Government. It is needed—for the development of electrical energy for power, for the development of atomic energy, for the mining of uranium and other rare ores vital to the defense program, along with many other Federal projects, all depend upon an abundant supply of water. It also makes a greater area available for homes and industrial expansion.

The general welfare, the economy, industrial growth and development of Denver, and the metropolitan area, as well as our entire State and region, are dependent and will be benefited by any project that will insure an adequate supply of water for the future. Water must come first—it is a forerunner of progress. To conserve this resource, we must all work together, cooperate with and help each other.

Years ago, when Denver had less than half the population it now has, the Denver Water Board had the foresight, as it continues to have, to realize the need for more water, and recognized the fact that it cannot be developed and made available without long-range planning. They are still looking to the future—to the expansion and growth that is sure to come.

We, as public officials, have a duty to see to it that this development, which is so vital and beneficial to the public interest and welfare, is accomplished without interruption. Such colossal undertakings cannot be solved at the local level alone, and therefore, it is one for prompt action by the Federal and local governments, all giving aid, financial, engineering, and otherwise, as needed.

I represent the numerous small communities surrounding Denver. Many are incorporated and have good local government. Many are in unincorporated county territory. But the whole area is bustling with new growth.

Some places, like my own Arvada, have been supplied by well water. The draft on the meager supplies of the subsurface aquifers has reached the breaking point, and we must look to the snows along the top of the Continental Divide for our further sustenance.

The water problem is immediate because of the tremendous growth of the Denver area which has been gone into by other witnesses. The area outside of Denver has shown even greater expansion than Denver itself. This is evidenced by the fact that the records of Denver's present water system show that in 1953, 47 out of every 100 taps for water, or 47 percent of all new installations, were made in the suburban area, while in 1949, only 27 percent were made there, showing the definite trend of rapid expansion in the fringe and metropolitan area. The increase in population between 1940 and 1950 in the cities and towns in the metropolitan area is additional evidence of the expansion and the need for future water. The city of Aurora, for instance, had an increase of 232 percent during this period, principally due to Government installations. The city of Englewood increased 56 percent, Golden 65 percent, Littleton 50 percent, Arvada 65 percent, and there are similar increases in the entire area.

Since 1950, this expansion has continued at a rapid rate.

This great population increase, with its tremendous economic potential, carries with it many problems, the greatest and most important: more water. Because we are a heterogeneous group, who live on the fringes of Denver proper, it might be thought that we would look with disfavor on the growth of the Denver water system and our consequent increasing dependence on it. Such is not the case.

We have all banded together in a nonprofit corporation, the South Platte Water Users' Association, as a nucleus for ultimately forming a taxing district capable of contracting with the United States Department of the Interior in connection with the development of the Blue-South Platte project of the Bureau of Reclamation. We also

have the Metropolitan Area Municipal Association to represent the towns, the South Platte group representing the area generally, including all the agricultural interests.

The work of these public groups is entirely harmonized with Denver's efforts. We all foster Denver's plans because they are the only possible solution for the water shortage which is immediate and pressing.

When the overall storage provided by the Colorado River storage project is an accomplished fact, we may expect these long-range plans to begin to come into fruition. But for now, the Denver development is our only hope for a timely solution of the need.

We are unable, as a heterogeneous group, to give satisfactory security to back the immediate financing of the long tunnel which has been described here. But if the preliminary financing will be furnished by the Federal Government, which represents all of us, we will be able to contract for actual water and pay for it when it arrives. We can't and don't have the governmental organization to finance the project until the water is actually available for purchase.

It might be thought that the State of Colorado could undertake the burden. There are two reasons why this will not happen. First, the well-established pattern is for the Federal rather than the State government to undertake reclamation. Second, in Colorado the 12 national forests, containing over 13 million acres, tax free, equal 40 percent of the entire area of the State. Our mountainous terrain, barren plains, large tax-free areas, create a very substantial burden on the remainder of the State. It is not likely that Colorado will be one of the first States to supersede the Federal Government in the reclamation field.

Therefore, we look to you gentlemen to assist us in this current development of water for Denver upon which we depend so largely for meeting our immediate needs in this regard.

Thank you very much.

Senator WATKINS. Thank you, Mr. Shulenburg.

Do you have some more witnesses Mr. Petry?

Mr. PETRY. Yes, sir. To save time, I would like to introduce at this time Mr. George Morrison, who is a member of the board. Mr. Morrison and Mr. Gumlick we will not ask to be witnesses, but we would like to have Mr. John J. Sullivan at this time.

Senator WATKINS. We are very glad to have you here, and your interest in the project will appear in the record at the point of this introduction by your representative. I assume you are also upholding and supporting the Denver position.

Mr. PETRY. Mr. John J. Sullivan is considered one of Denver's best informed men. He is vice president of the board of governors of the Association of Stock Exchange Firms, and past chairman of the board of governors of the National Association of Securities Dealers. In addition to this national recognition, he is a director of many of our western corporations.

Mr. Sullivan?

Senator ANDERSON. I would just like to add, Mr. Chairman, he is a very well known and fine businessman in Denver.

STATEMENT OF JOHN J. SULLIVAN, PRESIDENT, BOSWORTH, SULLIVAN & CO., INVESTMENT BANKERS, DENVER, COLO.

Mr. SULLIVAN. Thank you, Senator.

I don't appear before you as an expert on water questions or technical engineering problems. I am in the investment banking business, and in that capacity I have some experience and background of information on the subject of debt incurred for domestic water.

In Colorado there can be no doubt about the vital necessity for adequate water; it is recognized legally and in everyday life. Cities and towns in Colorado have no legal limitations imposed on them for supplying water to their citizens. There is no municipal debt limitation for providing water. No sounder security for municipal indebtedness exists in the West than water.

This project, about which you have heard much testimony, differs from our usual municipal water problem. It is a long-range project, much larger than we have attempted. We are accustomed to getting the water and the water user together, through financing known as Denver water-bond issues, and immediately payment for the water by its users starts to pay off the bond issues. There is no timelag between the procurement of water, its use, and the incurring of the debt.

But in this case, engineers testify it will be some 7 years from the time the project starts until water is delivered and paid for by the users. That 7-year lag requires financing, and that is a terrific burden to put on the city of Denver particularly since, as you have heard, the need for this water is felt over a large area surrounding Denver—not just Denver—an area very important in our national economy and for our national defense.

Water is the basis of our soundest municipal credits. The area around Denver needs the water. The water exists and should be put to use. The timelag of 7 years between the start of this project and its completion, when the water is available to the user, poses an unusual municipal financing problem in which United States Government help is requested.

Now you might logically inquire as to Denver's ability to pay back the money to the National Government after the project's completion I think I can answer that. Denver water bonds are recognized as top grade wherever municipal credits are discussed. Rated as AA, they are sought by the most discriminating investors.

Denver has, in its history, sold \$48,824,000 of water bonds, to provide more and more water to its ever-increasing population. It has paid off \$24,386,000 of those bonds. Its last water bonds were sold in 1951 at a net interest cost of 1.91 percent. When Denver sold its water bonds in 1920, the debt for water was \$54.29 per capita. Now the debt for water is \$79.92 per capita. Denver people voted a \$23 million water-bond authorization in 1947 by 61,394 to 21,683.

Senator ANDERSON. Your manuscript has 661,000.

Mr. SULLIVAN. We fudged a bit there. Let's take out that first 6. That is a typographical error.

The people know the water problem and pay for the water they use. The Denver water department has been well manged and has met

promptly all its obligations, including those of long-term financing, out of revenues derived from the sale of water without resorting to tax money or the use of the city's general credit—even though the city's general credit is pledged to the payment of water bonds. There is not a doubt in my mind that the United States Government would have a good loan in lending the money to complete this project. She would find Denver a good partner in this deal—or a good debtor on her books.

But, again I repeat, this project isn't just Denver's. It is to provide water for the gain in revenue from a great mass of potential customers who live outside Denver and who are not now subject to taxation by Denver. If this were not so, if the 7-year time lag were shorter, and if there were no conflict over water rights between Denver and the United States Department of the Interior, if Denver could assure private investors of full cooperation of the United States in the matter of right-of-way over federally controlled lands, and if Denver could also buy or furnish an equivalent in electric power for the conflicting interests in water, as pointed out a few minutes ago by Mr. Mosely, then I think the Blue River project might be a sound investment for private investors without aid or intercession by the United States Government.

If I may express my own philosophy, not statistics, on this subject, I would like to emphasize the character of the users of this water, because, in my opinion, that's the only difference between this project and other water projects that the United States Government has undertaken in the past. The development of the water resources of the West has in recent years been accomplished by a partnership between those who have money, those who labor, and a Government interested in serving the common welfare. We have many instances of Government financing of water projects designed to get irrigation water to the land for the benefit of the farmer and the country's overall agricultural production. The Colorado-Big Thompson project is an example, and Colorado's farming areas to the north of Denver are blossoming and prospering as a result of the money loaned by the United States Government to get irrigation water to its fertile soil. Similar irrigation projects have been financed by the Government, not only in Colorado but, as you well know, in many other Western States. The farmer pays back the loan out of the products that result from this excellent partnership—namely, labor, capital, and a Government serving the common welfare.

In this instance it isn't for agriculture that the water is needed, but for domestic use for the city dweller. But the very development of our western agriculture and the many Government and defense installations in the West have caused an increase in our cities and their water needs are just as real as the farmer's water needs.

In other words, as I see it, this proposal suggests that the Government do things no different from what it has done in the past, except that the people who are going to get the use of the loan and the use of the water are city people, not agriculturists; otherwise, the same partnership between capital, labor, and a Government serving the common welfare will be in evidence. The proposal by Denver here is a specific in a large, overall bill to provide a continuation of these same policies which have made this Nation great.

Without hazarding the risk of losing a penny of the development which threatens the whole economic future of Denver and the vast Federal investment there, provisions can be inserted in this bill which will guarantee both the investment and the future. It seems to me that the public officers of Denver who have brought this matter to your attention are to be commended for their diligence in seeking so logical a solution to what is otherwise an insuperable problem.

That it is a sound solution is testified to by official approval of the State of Colorado itself, by the official action of the States of the upper basin of the Colorado River, and the fact that it grants the urban dweller the identical plan of cooperation in water development granted his agricultural cousin—interest-free Federal money during construction, with assurance of full repayment, in this case with interest that is not provided in rural developments.

Mr. Chairman and gentlemen, we urge your favorable consideration of S. 1555, and the amendment that is proposed by the Colorado Water Conservation Board, and which was approved by the upper basin States and which includes the Denver Blue River project.

I thank you.

Senator ANDERSON. May I ask a question here?

Mr. SULLIVAN. Surely.

Senator ANDERSON. The amendment that was mentioned by Mr. Saunders would have suggested, I believe, that this become a participating project in the upper basin development. Then later on, you speak of borrowing \$75 million and paying it back.

Mr. SULLIVAN. Yes, sir.

Senator ANDERSON. The two do not mesh, do they? The two things are not the same, are they? If this is a participating project, you intend to use the revenues from the power dams at various spots to pay for it, and the city of Denver would not pay for it, is that not true, or what are you trying to do?

Mr. SULLIVAN. I think we are talking about the same thing, only in my view it would make it a much more feasible project if the Government would loan us the money during the period of construction, loan us the money interest-free during the period of construction.

My point there is that—

Senator ANDERSON. We are not talking about the same thing.

Mr. SULLIVAN. That the time lag is such that it would make it a little hard for us to finance it.

Senator ANDERSON. We are not talking about the same thing. I am not trying to be critical. I am only trying to get information. If it becomes a participating project, then the Bureau of Reclamation would look at it and say, "This project is going to cost \$75 million, of which the city of Denver can afford to pay back 10, 15, 25, 30, or 40 million dollars, and the rest of it will have to come from the power revenues from these dams."

Is that contemplated, or do you intend the entire \$75 million to be paid back?

Mr. SULLIVAN. We intend that the entire \$75 million should be paid back.

Senator ANDERSON. It becomes much easier to justify it on that basis, of course.

Mr. SULLIVAN. Yes, and we can do it.

Senator ANDERSON. There is no doubt about the ability of the city of Denver to pay for a water supply. It would be a very good and dependable water supply, and it would be very desirable.

Mr. SULLIVAN. Right. I am sure you get my point, that if we could get the period of construction financed—in other words, if the Federal Government would loan us the money until we get the tunnel built—then when we have the tunnel built we can put that water to productive use and get the revenue with which to pay back principal and interest on the \$75 million.

Senator ANDERSON. Then do I understand that all that you are asking the Federal Government to do is to make the money available to you without interest during the period of construction?

Mr. SULLIVAN. Yes, Senator.

Senator ANDERSON. Once the tunnel is constructed, you will proceed to pay for it at whatever rate of interest these bonds should take. You issue your bonds, and the Federal Government can buy them or you can issue them privately.

Mr. SULLIVAN. That is right, Senator. All we are asking on the financial side is, you might say, interim financing. We are also asking, as you know, for the matter about the Green Mountain, as the others have described it.

Senator ANDERSON. We have authorized and passed to the Senate the Fryingpan-Arkansas project, which is largely municipal water supply for other Colorado cities. Would it be possible to authorize this project in a similar fashion, or do you think it should be included in the upper Colorado River bill?

Mr. SULLIVAN. Senator, I cannot answer that. Might I refer that to Mr. Saunders?

Senator ANDERSON. Undoubtedly he thinks it should be included in the Colorado River bill; is that right, Mr. Saunders?

Mr. SULLIVAN. Mr. Saunders, will you answer that question?

Senator ANDERSON. I was saying that the Fryingpan-Arkansas project is a domestic water supply bill which we approved very recently in the Senate Interior Committee. It takes the problem out of the work of the Upper Colorado River Commission and will move water by transmountain diversion over to the use of a project on the eastern slope.

Do you feel it would be better for this Denver project to be put in the upper Colorado storage bill instead of going into a separate bill like the Fryingpan?

Mr. SAUNDERS. We felt it was more appropriate to be a concurrent, though not a participating project, because of the fact—

Senator ANDERSON. What you just said is very important, because there is a statement in here that you want it to be a participating project.

Mr. SAUNDERS. Not in the sense that we participate in any of the earnings of the powerplant, Senator. We do not expect to participate in the earnings of the powerplant.

Senator ANDERSON. I so understood it, but I read a statement here and it looked as if that was not true.

Mr. SAUNDERS. We think we should be in this bill, because this bill contemplates the comprehensive development of the upper basin, and

we don't think it would be comprehensive if it omitted Denver, which is the largest single economic unit in the upper basin.

Senator ANDERSON. Thank you very much.

Thank you, Mr. Sullivan.

Senator WATKINS. Thank you.

Mr. PETRY. Mr. Chairman, I would like to introduce Mr. Armin Barney, president of the Colorado Springs National Bank and chairman of the Colorado Springs Water Resources Committee.

STATEMENT OF ARMIN BARNEY, PRESIDENT, COLORADO SPRINGS NATIONAL BANK, AND CHAIRMAN, COLORADO SPRINGS WATER RESOURCES COMMITTEE, COLORADO SPRINGS, COLO.

Mr. BARNEY. Mr. Chairman and gentlemen, I have a very brief statement.

What has been said here of Denver applies with equal or greater force to the city of Colorado Springs. While Colorado Springs lies 75 miles to the south of Denver, the geography of the country is such that coordination of the efforts of the two cities in the development of the Continental Divide waters available for them is necessary.

As of this moment, Colorado Springs would be in a desperate situation for water were it not for the cooperation she has received from Denver which has rented capacity in Denver's water storage system to Colorado Springs, and has permitted Colorado Springs to add to that storage system, creating that temporary means of meeting an emergency which will tide Colorado Springs over until she can create the permanent adequate water supply system which is now partly under construction.

Colorado Springs has works which contemplate diversion of water from the Blue River at altitudes such that these diversions can never exceed 20,000 acre-feet on an average. The long-time supply must necessarily look to diversions from lower altitudes and a tie-in with the long tunnel which has been discussed here, with exchanges of Platte River water upstream to elevations where Colorado Springs can take advantage of it through further cooperation on the part of the city of Denver.

This sharing of a common natural resource for which the two cities are in a competitive position, could not be developed in this cooperative way were it not that the utmost harmony exists between the people of these two cities and their public officials. This situation is of long standing, and may be expected to continue. There is continuous social intercourse between these two cities, and each has much to give to the development of the other.

We wish to give assurance that whatever is done here toward the immediate development of the Blue River project of Denver will be of great benefit to Colorado Springs and will make it that much easier for our city to make progress in the development of its own water resources.

Thank you very much.

Senator WATKINS. Thank you, Mr. Barney.

Senator ANDERSON. Could I break in here to ask Mr. Will a question?

The statement Mr. Saunders made—and I think we ought to clear this point up before we finish with the Denver people—starts off :

The Upper Colorado River Commission, on January 17, 1954, unanimously adopted a resolution to the effect that the Colorado River storage project bill should be revised to include :

(3) The Denver-Blue River diversion as a participating project * * *.

Mr. WILL. Yes, sir. That statement is made—

Senator ANDERSON. If it becomes a participating project, then it is eligible for money from these dams.

Mr. WILL. The statement was inartistic, Senator, and not properly descriptive of the situation of the Denver-Blue River diversion.

It is not properly so called a participating project, because it does not participate in the financial assistance to be derived from the power revenues of the holdover storage reservoir.

Senator ANDERSON. May I ask you whether or not you think that there would not need to be a separate paragraph in the bill dealing with this one subject, rather than amending lines 23, 24, and 25 to include this as a participating project?

Mr. WILL. Under the amendments, Senator, that we recommended to Senator Millikin as chairman of the subcommittee, I believe you will find that we have suggested that this be taken care of by a separate section.

Senator ANDERSON. I am glad to hear that your judgment checks with what I thought about it.

Senator WATKINS. I take it, Senator, that when we go into executive session, the amendments that have been suggested and some that we may think up ourselves will be duly considered, and we will come out with a bill that we hope will cover the situation.

Senator ANDERSON. I have no other questions, if you decide to put it in a separate section. I was a little worried when I read this language, because if you try to add it as a participating project, you probably are going to run into a lot more difficulty than you would if you had a separate paragraph that permitted the credit of the United States Government to be used during the construction period, with Denver paying it out afterward.

Thank you very much.

Mr. PETRY. Mr. Chairman, we have one more witness, but we wish to thank you for letting us appear at the time that you designated, so the rest of the witnesses can leave to catch their plane back to Denver. Our last witness is Mr. Hudson Moore, a member of the board, who has been very active in civic affairs in Denver, and would like to sum up our case before you at this time.

Senator ANDERSON. Senator Watkins and I may have to leave. A vote is scheduled on the Millikin amendment at about 5 or 10 minutes after 4. So if we get up and leave, you will understand no discourtesy is intended.

Mr. MOORE. I am staying over in Washington tonight, sir. If you would like to have me appear tomorrow morning, I would be more than happy to do so.

Senator WATKINS. You can start, and then if we have to leave, you will understand the reason. We would like to finish with as many witnesses as we can today, because we have a crowded calendar for the next 2 days. The two Wyoming witnesses have been here for some time. They were scheduled earlier, but did not arrive in time. We

understand their testimony is not very long, so following your testimony we will attempt to take the two Wyoming witnesses, and then we will come back to the Colorado witnesses.

You may proceed.

STATEMENT OF HUDSON MOORE, JR., MEMBER, DENVER BOARD OF WATER COMMISSIONERS, DENVER, COLO.

Mr. MOORE. Mr. Chairman, my name is Hudson Moore, Jr. I live at 2201 East Alameda Avenue in Denver, Colo. I am a member of the Denver Board of Water Commissioners.

It is my pleasure and honor to briefly summarize and, in 1 or 2 respects, to supplement the information and statements submitted by the other gentlemen from Denver and its metropolitan area who have appeared before you today.

May I say, sir, in speaking in favor and support of S. 1555, that this is the first time in my life that I have had the opportunity to appear before a committee of such national importance. For this opportunity I am deeply appreciative.

May I add, if no such opportunity ever again should be afforded to me during my lifetime, both I and my associates are equally convinced, without reservation, that no more important or vital problem will confront our community than this one which we are discussing today, this lack of water.

First, may I review some of the interesting and pertinent information that has been submitted to you concerning the characteristics of Denver and its metropolitan area.

It has been pointed out that Denver is primarily a large distribution center, furnishing goods and services to a wide trade area. Denver today is the hub of the wheel of the entire economic growth of the Rocky Mountain region.

Serving this great trade area of 1,000 miles of radius, Denver has experienced a remarkable growth in population. This population trend has been as follows: 1940, 407,000; 1950, 563,000.

The estimated population for the future years is as follows: 1954, 650,000; 1963, 750,000; 1970, 820,000—if we should have water available.

This increase in population from 1940 to 1954 is 65 percent. The present annual increase in population is from 24,000 to 30,000 people per year. This is an increase every 12 months in population, if you please, equal approximately to that of the entire city of Grand Junction, Colo.

Thirty-seven percent of the entire population of the State of Colorado is now served by the Denver municipal water system.

Secondly, this remarkable growth in population has been accompanied by an equally remarkable growth in business. Since 1939, bank clearings in Denver have increased 5 times. Perhaps a doubling of bank clearings might be attributed to the decrease in the purchasing power of the dollar, but the remaining increase of three times is attributable to the increase in physical volume of business being done.

Sales of electricity have always been looked upon as a sound measure of economic activity. Since 1939, kilowatt-hour sales have increased in Denver $4\frac{1}{2}$ times. In this year alone in Denver, prime office build-

ing space is being increased by 50 percent by the erection of 4 major new office buildings, 3 of which each are larger than any existing public office building in Denver today. One of these major buildings, although not yet completed, has fully rented all of its space. Only 35 percent of its rented space represents space being vacated in other buildings, and all of the remaining space is being filled by either firms and businesses moving to Denver who are not now there, or by an expansion of the other tenants moving into the new buildings.

A recent housing development has been announced in Denver to build 6,000 houses in 1 private housing development, providing homes for an additional 24,000 people not now residing in Denver.

Senator WATKINS. The committee will be in recess until 9:30 a. m., Thursday, July 1, 1954.

(Whereupon, a recess was taken at 4:15 p. m., and it was later announced that the hearing would reconvene at 9:30 a. m., Thursday, July 1, 1954.)

COLORADO RIVER STORAGE PROJECT

THURSDAY, JULY 1, 1954

UNITED STATES SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS,
Washington, D. C.

The subcommittee met, pursuant to recess, at 9:30 a. m. in room 454, Senate Office Building, Washington, D. C., Senator Arthur V. Watkins, Utah, presiding.

Present: Senators Arthur V. Watkins, Utah; Frank A. Barrett, Wyoming; Clinton P. Anderson, New Mexico; and Price Daniel, Texas.

Present also: Senator Wallace F. Bennett, Utah.

Present also: Elmer K. Nelson, staff consulting engineer, and N. D. McSherry, assistant clerk.

Senator WATKINS. The committee will be in session.

We will resume with the witness who was interrupted when we adjourned yesterday.

STATEMENT OF HUDSON MOORE, JR., MEMBER, DENVER BOARD OF WATER COMMISSIONERS, DENVER, COLO.—Resumed

Senator WATKINS. Do you have a prepared statement?

Mr. MOORE. No, sir; I do not have. It is not typed up.

Senator WATKINS. Can you not give it to us the way it is? We are getting behind and some people have plane reservations. We have to catch up if we can.

Mr. MOORE. My name is Hudson Moore, Jr. We had reviewed briefly, yesterday, Mr. Chairman, the remarkable increase in growth of the population of Denver and its equally remarkable increase in economic growth as well. In Denver and its metropolitan area is a great concentration of Federal Government employees and military personnel, and an immense investment in Federal Government plant and facilities.

Approximately 100,000 Federal employees and military personnel live and work in this area.

The present value of the investment in Federal installations and facilities in this area is estimated at approximately \$400 million, with a great majority of this investment being located outside of the city limits of Denver, but served with water by the Denver municipal system.

These facilities include the Rocky Mountain atomic plant, Lowery Field of the Air Force, Buckley Field of the Navy, Fitzsimmons Army Hospital, Rocky Mountain Arsenal, the Navy Finance Center, the

Federal Center of the Bureau of Reclamation, and the Veterans Bureau, Fort Logan, Veterans' Administration hospital, the Bureau of Public Roads, the Federal Correctional Institution, and numerous downtown facilities.

This large number of personnel of the United States Government and the great investment of the United States in this area, indicates the tremendous stake the Federal Government also has in finding a solution to this water problem.

May we now examine the present situation as it pertains to the water supply of Denver and the metropolitan area.

Denver has enough water to supply a population of 750,000 people, which will be reached by 1963. Beyond that point, we have no further available supply. A boundary or line has been drawn about the city extending slightly beyond the city limits and containing an area which will accommodate a population of 750,000 people.

Today, outside of this line, no further water taps are being permitted, for the reason that we have no available water to serve a population over and about the 750,000 which can be accommodated within this area.

When the time comes that Denver has insufficient water to serve both the area within its city limits and the contiguous area lying outside the city limits, including these tremendous Government establishments, the city, by its charter, has no alternative but to throttle down the water being supplied to these consumers outside the city limits.

Because of the unprecedented drought and dwindling reserves, Denver today is operating on a restricted program for lawn irrigation. If this drought condition was superimposed upon the population expectancy of 1963 and subsequent years, the situation would be well nigh disastrous.

The problem of insufficient water is of vital importance to, (1) the citizens of Denver; (2) the families and businesses residing in the metropolitan area; and (3) the citizens of the United States through their Government because of the many installations and great investment of the Federal Government in this area.

The 400 millions of investment of the citizens of the United States in the periphery area is vitally dependent upon Denver's water for the continued profitable use of these facilities. Denver equally is desirous of furnishing water to meet the needs of these installations and to do so Denver must obtain the water which is required by the consumers within the city limits, who, by charter provision, are first in line, plus that water needed by the consumers and Federal facilities in the periphery area.

Where is this water to come from? There is one source of additional water and one source only, namely, from the Blue River, a tributary of the Colorado River on the western slope. That is, on the western side of the Continental Divide. Although the water law of Colorado is very clear, that the first in time is the first in right, insofar as the rights to the use of water are concerned, nevertheless the question has been raised, and I quote:

is there sufficient water in the Blue River to meet the present and future requirements of the people along the stream in western Colorado and also the essential requirements of Denver?

The State of Colorado through its official water agency, the Colorado Water Conservation Board, which is representative of all the citizens and interests of Colorado, employed a nationally known firm of engineers to study this problem.

After careful study, this firm, Leeds, Hill & Jewett, of Los Angeles, have found that there is sufficient water in the Blue River to meet the present and future economically feasible needs of the western slope of Colorado, and also to meet these needs of Denver and with water remaining.

Senator WATKINS. Just a moment. You referred to this so-called Hill report. Do you have a copy that you might leave with the committee for its files?

Mr. MOORE. Mr. Chairman, I would like to offer as an exhibit my file copy of this report. It is the only copy we have in Washington, but we will send 15 copies on immediately for the committee.

Senator WATKINS. It will be received for the file. It won't be printed in the record, but it will be received for the file.

Mr. MOORE. Thank you, sir.

The findings of this engineering firm of Leeds, Hill & Jewett, have been formally accepted and approved by the Colorado Water Conservation Board as the findings and policy of the State of Colorado. There now remains to be solved the intergovernmental problems and the engineering and financial problems of bringing this water to Denver. The Upper Colorado River Commission unanimously has adopted a resolution to the effect that the Colorado River storage bill should be revised to provide that the Denver Blue River diversion be included, subject only to the provision that the Secretary of the Interior and the Congress shall approve the Denver plan and the method of repayment.

Since the Senate bill omits the Denver project, the Upper Colorado River Commission has made available for your consideration this same amendment. This amendment in general provides for a loan of \$75 million to Denver to build the Blue River project for the purpose of supplying the Denver metropolitan area with water for municipal uses. The amendment provides that the loan shall be paid back in 50 equal annual installments at the going rate of interest, commencing on the completion of the project.

This project includes a 72,000-acre reservoir at Dillon which will catch water from the Blue River, a 23-mile transmountain tunnel to carry the water from the western to the eastern side of the Continental Divide, and a reservoir at Two Forks to use Blue River water to generate electricity for use in the Denver area.

In 1953 the Federal Power Commission by its "First Form Withdrawal" withdrew the Two Forks Reservoir site from use by the public and held it for future power developments.

The Denver project will develop power at the reservoir site.

One thing Denver seeks by this legislation is clearance of right-of-way for a reservoir at this site.

One other problem to be disposed of in the operation of the Denver Blue River project has to do with the present use of Blue River water by the Department of the Interior for the generation of power at Green Mountain Reservoir, a part of the Colorado-Big Thompson project. It has been suggested that this problem can be equitably

solved either by Denver compensating the Department of the Interior for the loss of water used on annual basis as may be diverted through the Montezuma tunnel or by making a lump-sum payment which would offset the reduced power production potential of the Green Mountain powerplant.

In either case, the required adjustment is not important enough to substantially affect the economic feasibility of the project as a whole, and is one subject to be worked out between the two governmental parties concerned. The provisions with respect to the construction loan are that the Federal Government offer a maximum period of 15 years, will advance funds just ahead of the need for construction, and moneys advanced for each unit will be interest free until the unit itself is completed.

Thereupon the principal will be repayable in 50 annual installments plus interest at the going rate for long-term Federal money or the principal repaid at Denver's option. Once deliveries of water are assured by completion of the tunnel, sales of the water will clearly guarantee the repayment of all costs. The loan itself is on a sound business basis. Denver's only request which might be called a subsidy is that the money be interest free during construction.

Quite generally money advanced by the Federal Government for projects of this type has been interest free during construction. The reclamation laws, the Defense Public Works Act and other laws give ample precedents for this type of subsidy. As one example, the city of San Diego was assisted by the Federal Government, House Report No. 907, 82d Congress, in the construction and financing of a long conduit for its water supply on the grounds that San Diego had grown in population, had a large aircraft industry, a large naval establishment, and a limited water supply.

May we submit that Denver likewise has grown rapidly in population, has a large military establishment, and many important national defense installations, including an important unit of the Atomic Energy Commission and an extremely limited water supply. It would be a tragedy indeed for these great installations in a few years to begin to dry up and wither away for lack of water when the water can be made available if we together will create the way.

In all of its complexities, this project for its success greatly needs and requires the aid and intercession of the United States Government for the following reasons:

The project is for three large groups of consumers: those who live in Denver; those who live outside of Denver, and whose number is increasing more rapidly than those who reside inside the city; and the many installations of the Federal Government itself.

The 7-year time lag in construction presents an extremely difficult financial burden to put on Denver alone.

The need to resolve the water rights problem between Denver and the United States Department of the Interior is important.

Rights-of-way over federally controlled lands must be settled.

A disposition must be made of the problem of either buying or furnishing an equivalent in electrical power for that which is generated by Green Mountain Reservoirs by the Department of the Interior.

All of these reasons point up the great need for the intercession by the United States and the participation in the solution of this prob-

lem. We individually and collectively respectfully urge you to accept the proposed amendment to the Colorado River storage project bill, and we greatly appreciate this opportunity which you have afforded us to present our comments and recommendations to you today, sir.

Thank you.

Senator WATKINS. Thank you.

The next witness will be Dan Hughes, of Montrose, Colo.

STATEMENT OF DAN H. HUGHES, ATTORNEY FOR THE UNCOMPAGHRE VALLEY WATER USERS' ASSOCIATION, MONTROSE, COLO.

Mr. HUGHES. I want to thank you for letting me go on at this time. I made arrangements to get away at 12:30.

I am Dan H. Hughes, of Montrose, Colo. I have lived in the Uncompahgre Valley on the western slope of Colorado since 1904. My occupation has been that of a practicing attorney and the operation of irrigated farms and livestock.

My experience with water matters in Colorado has been as an attorney for the Uncompahgre Valley Water Users' Association which operates the Uncompahgre Valley irrigation project, a Federal reclamation project.

I have been or am a member of the following boards: Colorado Water Conservancy Board until 1952; Uncompahgre Valley Water Users' Association Board at the present time; Colorado River Conservancy District Board at the present time.

With my sons, I now own and operate some 4,000 acres of irrigated land. We run both sheep and cattle.

In western Colorado we have varied agriculture. The type with which I am most familiar is the raising of hay, grain, and the running of livestock. We have summer pastures in the mountains, winter pastures in the desert. There are approximately 4 months on the average when our livestock must depend upon raised feed.

Western Colorado has a wealth of minerals. The largest deposits are oil shale; next in size is coal; and at present, the first in importance is uranium ore. We also have iron, copper, lead, zinc, tungsten, and other minerals too numerous to mention.

The limiting factor in our development on the western slope of Colorado is water. Let me leave the text for a moment and say that it has been my impression that everyone who settles in an arid area must realize that the limiting factor on the growth is water. However, from the remarks of Denver, they seem to feel that there should be no limiting factor whatsoever on Denver, even though they are in an arid region.

We are limited by water, recognize it, and have to live with that condition.

The main supply of water is from the melting of the winter snows in the higher elevations. This water comes through small streams, which in the main are not in deep canyons, into the larger streams which flow through the bottoms of the canyons. Our problem is to make this water available for use on the mesas or flat lands. Unquestionably we need the assistance of the Federal Government in solving this problem.

Through private industry and several reclamation projects, the main and largest of which is the Uncompahgre, in the course of some 80 years we have put 1,188,000 acre-feet of water to a consumptive use. There is at present transmountain diversion, a large percentage of which is through Federal projects, of 377,000 acre-feet. There is at present an additional committed use of 528,000 acre-feet, giving a total of present and present committed use slightly in excess of 2 million acre-feet. According to the engineers this leaves 1 million acre-feet available for uncommitted use.

We know the limitations of our growth will be water and that even if this full 1 million acre-feet is made available for consumptive use in western Colorado we still cannot reach the maximum development in growth that our resources other than water justify. This is true even if there were not another acre-foot of transmountain diversion, and if we had the total supply allocated to western Colorado by compact between the upper basin States, taking into consideration the Colorado River compact.

We recognize that if western Colorado is to have its allocated supply of water it must proceed to put the same to beneficial use within a reasonable time. The use we have in mind is consumptive use; that is, for irrigation, the development of oil shale, coal mining, and municipal use for our ever-growing cities such as Grand Junction.

For this use to be made of the water it must be stored near its source of supply in the mountains in sufficient quantities that it will be available throughout the entire irrigation season. This will mean a large number of small reservoirs with canals and ditches for distribution of water.

To illustrate, let us take the situation this year on the Gunnison River. To produce a crop we must have water through August. For the last 30 days on the smaller streams there has been a serious curtailment of water. The Gunnison River itself is so low the Uncompahgre project is already drawing water from the Taylor Park Reservoir to supplement direct-flow supply. Streams now running will fast go down in volume and yet we have ahead of us a minimum of 2 months' irrigation. The only answer to our problem is upstream reservoirs. We visualize a large number of small reservoirs located sufficiently far upstream so that the water can be made available for the land lower on the stream.

Waters from a small reservoir above the irrigated lands in Gunnison County would be first used for the irrigation of these lands. Our experience is that a minimum of 60 percent of the waters so used would return to stream; these waters would then be available for the Gunnison Tunnel and would be used on the Uncompahgre project. After this use they would return to the Uncompahgre River and would be available for use in Delta County. Such water as was not taken through the tunnel would be taken down the Gunnison River and be available in Delta County. Farther down the Gunnison the Redland's project in Mesa County would receive benefits from the waters and such as was not consumed would be available for irrigation the third time. It is a fair estimate that every foot of water stored high on the stream in this particular area would furnish a minimum of 2 feet of water for irrigation. This, of course, is a favorable situation but in the main the same condition would exist on the

entire western slope provided the reservoirs were built sufficiently high on the stream.

We recognize that for us to have a million acre-feet available of our share of Colorado River water in each year, holdover reservoirs farther downstream will also be necessary to account of the Colorado River compact. On the other hand, without upstream reservoirs the water so stored will not in any way make water available for our consumptive use. In other words, only one-half of the problem is solved, and this is the small half, by downstream reservoirs.

It is our feeling that the present bill should make provision for the small upstream reservoir so that the planning will cover the full problem rather than only half of the problem confronting the areas where the waters rise.

Frankly, we have been and are of the opinion that the reclamation officials have been so engrossed with their large downstream reservoirs and powerplants that they have seriously neglected plans to make the water involved available for consumptive use. That this is particularly true on the western slope of Colorado, we further feel that now is the time when we should insist upon the full plan being incorporated into the present bill.

The Bureau of Reclamation cannot say that interested parties on the western slope have not urged for many years complete and detailed surveys so that the waters in question can be made available for consumptive use. Our area has been under the jurisdiction of the Salt Lake office. Numerous and repeated requests have been made along the line that they make surveys and include as a part and parcel of the present plan works which would make the waters in question available for our use. Our requests and urgings have received little response.

I would say that we had made a nuisance out of ourselves, we have been so strenuous in our demands that they complete their surveys to make this water for use on the western slope.

Senator WATKINS. When did you start making these demands?

Mr. HUGHES. As far as I can tell you, Senator, the first official demand that I know of was made by the Colorado State Water Board in approximately 1950. Privately the demands have been made by all of us interested in water matters, on the local reclamation officials, and up to Mr. Larson at Salt Lake.

I, myself, have repeatedly urged it for the last 5 or 6 years.

Senator WATKINS. And you think that began in 1950?

Mr. HUGHES. Officially I think that is about the time, However, more or less unofficially they have been made for a longer period than that.

We bring this matter to the attention of this committee so that, if possible, due consideration when the final bill is finally drafted, can be given to adequate surveys and the construction of works to make the waters allocated to us available for use.

We are attempting to follow out the policy established in the State of Colorado in the past. Briefly, this policy was that waters originating on the western slope were to be available for the development of the western slope and none to be exported to the eastern slope except it be established that such waters are available in excess of that needed for present and future development on the western slope.

This policy was first recognized by a Statewide group who met at the call of Colorado's then Governor, the Honorable Edwin C. Johnson, now United States Senator from Colorado, in 1935.

At this meeting Mr. Malcolm Lindsay, then the city attorney for Denver, introduced a resolution in connection with the request for Federal moneys for the Blue River transmountain project, which moneys were to finance a survey—

to secure the necessary data to determine all pertinent questions relating thereto, including adequate protection of present rights and future needs on the western slope.

In 1943 this policy was recognized by an act of the Colorado Legislature which, in substance provided that any plans for the exportation of western slope water to the eastern slope shall be—

designed, constructed, and operated in such a manner that the present appropriations of water, and in addition thereto prospective uses of water for irrigation and other beneficial consumptive use purposes * * * within the natural basin of the Colorado River in the State of Colorado, will not be impaired or increased in cost.

The policy was restated by the Colorado Water Conservancy Board in 1952. So we can see that the record is clear on Colorado policy.

This same policy was recognized in Senate Document 106 of the 82d Congress, 2d session, in connection with the Fryingpan-Arkansas diversion as a part of the operating principles. This same policy is recognized in Senate Document 80 of the 80th Congress, 2d session. In this document provision is made for the construction of the Green Mountain Dam to create the Green Mountain Reservoir, waters from which would be used and the project would be operated to effect the following primary purposes:

1. To preserve the vested and future rights in irrigation.

Remember, this all refers to the western slope of Colorado.

2. To preserve fishing.

4. To conserve and make use of these waters for irrigation, power, industrial development, and other purposes.

5. To maintain the conditions of river flow for the benefit of domestic and sanitary uses.

All of these things were to be done in western Colorado.

The document further provides—

that water released shall be available without charge to supply existing irrigation and domestic appropriations of water including the Grand Valley reclamation project * * * and for future use for domestic purposes and for irrigation of lands thereafter to be brought under cultivation in western Colorado.

May I say that this is the water that the Denver council was speaking of yesterday that they want to buy and take to the eastern slope.

In spite of this policy we have not been able to obtain the assistance of the Bureau of Reclamation along the line of adequate surveys to determine projects necessary to permit the western slope to make full and adequate beneficial use of the waters available.

Senator WATKINS. Remember there was a report made in 1950 by the Bureau of Reclamation on the upper Colorado. That was when you say you started making your official requests for extensive work on the western slope. All of us in the Congress and particularly on the Interior Committee know the struggle we have had to make to get money to keep the program going at all. If you didn't start your

requests until 1950 and you then came in when appropriations were the size they were, we would have been required in my judgment to drop a lot of other projects half finished. That wouldn't be very beneficial.

Mr. HUGHES. We started, Senator, way before that. We got this far along—Mr. Jex, who is here in the room, was then with the Bureau of Reclamation, manager at Grand Junction, for our particular small division. We finally got permission to make a survey in Gunnison, Montrose, and Delta Counties. The Bureau would not recognize that, and correct me if I am wrong, and called it a reconnaissance survey. Repeatedly as a member of the Colorado State board, I tried to get that recognized as a survey. They continually called it just a reconnaissance survey. That showed the availability of small reservoir sites. It showed that the cost of that water per acre would be from three to seven hundred per acre. My memory is that was based on two and a half acre-feet per acre.

Now, that water would come down to us. We could use it in the Uncompahgre Valley. We already have 106,000 acre-feet of storage in the Taylor Reservoir, high up on the streams in Gunnison County. If we had 75,000 acre-feet more storage, it is my opinion that it would serve fairly adequately the needs of Gunnison, Montrose, from the project down, Delta and a portion of Mesa County.

We have been going at that for years. I say 1950, and I think that was the date, it could have been 1949, this after repeated urgings we finally got the Jex reconnaissance survey and the Jex report. It is true that the Bureau of Reclamation, starting in 1903, made some surveys up there. At that time they selected the Taylor Reservoir site. They considered the site on the lake fork of the Gunnison.

But we could never, and they can correct me if I am wrong, with repeated urging, let's say over the last half century, get a detailed report along the line of the Jex reconnaissance report. Mr. Jex is here and will make a brief talk. If the Senators desire to go further into that, I suggest they ask Mr. Jex about his difficulties in getting authorization to even make this reconnaissance survey.

Senator ANDERSON. Mr. Hughes, I am looking at the 1946 report, and the maps that are with it, which you are very familiar with, I am sure. How many of these reservoirs indicated are the ones you are talking about? Are these here on the map the ones you are referring to?

Mr. HUGHES. I would have to see the map.

Senator ANDERSON. I am sorry. I thought you were that familiar with the map.

Mr. HUGHES. They had a lot of these things in mind in 1946. That is true. This has gone over a half century, but not as completely as we visualize it.

On the other hand, the Bureau's efforts have been and are directed toward the construction of works for the exportation of water, and we believe at a much higher cost per unit irrigated than the cost of constructing works on the western slope so that we might utilize the water.

I think this is a correct statement: In the last 20 years there has been approximately \$2,200,000 spent through our general area by the Bureau of Reclamation, \$2 million on one project and \$200,000 to build a fruit growers' reservoir. Against that, there has been \$165 million

spent for transmountain diversion on the Big Thompson and another \$150 million at least has been allocated to the Arkansas diversion.

The question might be asked, "Are we overestimating our needs?"

Quite recently the research staff of the University of Colorado estimated a population of 2 million people in the area involved in the near future.

This estimate is based upon the facts set up in their survey. Oil shale operation would mean a city of 500,000 people; mining and treatment of uranium ore is expanding each day. When oil shale operations begin, and all the experts agree they will have to begin by 1975, we must prepare for a tremendous increase in our population and in our industries.

I wish to quote from Tell Ertl, formerly engineer with the United States Bureau of Mines, now dean of engineers at the University of Ohio, who holds a degree of bachelor of science in mining engineering, a master's degree and the degree of doctor of philosophy, and who was formerly chief of the oil-shale mining section of Rifle, Colo.

Quoting:

Numerous industries subsidiary to the oil-shale, power, chemical, fertilizer, and aluminum industries will be required. As one example, the oil-shale mines will need 1 million pounds of explosives daily. To supply the mines, an explosive-manufacturing plant will be set up in the oil-shale areas. Foundries, fabricating plants, specialty manufacturing plants, and perhaps even a steel plant will be built to supply the primary industries.

* * * New consumer industries will arise and present ones expanded throughout Colorado. The taxes and other economic returns derived from the oil shale and allied industrial development will take place only if the State of Colorado reserves water in the Colorado River.

Mr. Ertl, in a pamphlet published in 1953, states that all engineers who have studied the availability of liquid fuel to supply future domestic demand are confident that within a decade a portion of our domestic demand must come from synthetic fuel from oil shale; that these fuels cannot be made available unless water for this vast industrial development is retained in the Colorado River.

At a recent meeting at Glenwood Springs, eight of the major oil companies had experts present. They fixed the latest date that oil production from shale must begin in 1975. The earliest date was fixed at 1965. They estimated the minimum production as being from 1 million to 2 million barrels per day. All of these engineers recognize that water might be a limiting factor of the oil-shale industry.

To us it seems a wise course for the Federal Government would be to immediately plan works and construct the same as soon as possible which would make the waters now available on the western slope usable for the development of the western slope. Such works would be far less expensive than those now contemplated and would follow out the long-time policy adopted by the State of Colorado and which we think is essentially reasonable and just. That is, the area which produces the water, which is a part of its natural resources, should be permitted to use it to its full extent needed.

We, of course, admit the necessity of constructing large holdover storage reservoirs. We recognize the wisdom of making such stored waters available for the production of electric energy. It must be recognized, however, that the reason for constructing these reservoirs is to assure the upper basin States of their allocated waters in dry

years as well as in wet years. There is little use of making water available for use and not constructing works to use the water. So, we say, "Let's put the whole plan into the present bill and, where there has not been sufficient surveys to determine proper works to utilize the water so made available, that the bill provide for such surveys."

We know that all construction cannot start at one time and that the total overall plan will take years. On the other hand, we see no reason why in the initial bill the whole plan cannot be incorporated and all surveys and construction treated as one unit and necessary filings or claims to the water be made so that even if there is a delay in construction the water will be made available when the works are constructed.

Thank you, gentlemen.

Senator WATKINS. Thank you.

Mr. George Cory of Montrose, Colo.

STATEMENT OF GEORGE CORY, MONTROSE, COLO.

Mr. CORY. Mr. Chairman, you will note that the report of mine consists of three sections. In the interest of complying with what you stated at the opening of the hearings this morning, I will not read from the report but will brief it, and I think I can do so in the matter of a very few minutes.

You may then at your discretion select those portions which you think should be made a part of the record, or a part of the file.

My name is George Cory. I am from Montrose, Colo., and am in the radio broadcasting business. My particular qualification to appear before this committee is perhaps the fact that I am interested in what this water means to people.

I can add very little in an engineering sense. On the assumption that the compact of 1922 and the upper basin compact of 1949 were intended as specific instruments by which we would abide in developing the upper and the lower basins, I say then we have established the end result we are trying to achieve and now we must look only for the means.

The people of my area respectfully ask your consideration of the Curecanti project and the Echo Park project in the initial phases of construction. And we ask, too, the earliest practical development of the participating projects of western Colorado on which adequate surveys have been made and a set method for going forward with survey work on all other portions of western Colorado where information is now inadequate.

We support Curecanti and Echo Park as they are presently in the Senate bill.

Now I want to get to the meat of this matter, as it concerns me as a citizen interested in the economic welfare of the locality, the area, and the Nation.

The House committee voted favorably on Curecanti, although it does not meet the criteria of A-47, which was promulgated earlier in this year. A-47 is an instrument that defined and confines—

Senator WATKINS. Who was it issued by?

Mr. CORY. It was issued by the Bureau of the Budget.

Senator ANDERSON. That is the yardstick by which we establish feasibility.

Mr. CORY. That is correct.

Senator WATKINS. I wanted to get it for the record.

Mr. CORY. All right, sir.

A-47 would eliminate the Curecanti project. The Montrose and the Delta County water committees were not in agreement. On June 1 we submitted a request to the Colorado water board, a request to the Bureau of Reclamation, to advise on methods that may be used on determining additional benefits to be obtained on flood control and general economic benefits and recreation.

Senator ANDERSON. You recognize that A-47 is not a part of the law of the land?

Mr. CORY. I do.

Senator ANDERSON. There are many people, and I am one of them, who believe that the Congress has some rights in this field, who do not agree with A-47 in the slightest and look forward to the day when it may be corrected. I wanted to give you that sidelight.

Mr. CORY. I am aware of that.

Senator WATKINS. I would like to observe that in recent bills we have reported out we have thrown it out the window.

Mr. CORY. I am aware of that, and am making only a further appeal to the wisdom of Congress.

Senator ANDERSON. I want you to know that Congress has not abdicated because the rule came out.

Mr. CORY. We wrote Mr. Larson of the Bureau of Reclamation, and he answered our inquiry, telling us that the Bureau will make an appraisal of the irrigation and the power benefits and that they would seek the cooperation of the National Park Service to analyze the recreational values, the Fish and Wildlife Service to evaluate the benefits to fish and wildlife and the Corps of Engineers to evaluate the flood-control benefits.

Now I want to point out to the committee that Mr. Larson in his letter did not mention industrial uses and general economic benefits. In our area we were very serious about this, so from our neighbors and our own purses we collected about \$5,000 and we engaged the services of the University of Colorado business research bureau, a firm of certified public accountants, and a consulting engineer, and then taking approximately 8 months off from my own business and other gentlemen from their businesses, we compiled a report of approximately 400 pages, with this express purpose:

What do these projects mean to people in terms of homes, in terms of opportunity for young men who find every day the door to establishing their own business or their own farm closed a bit tighter?

There is an addenda attached, which is addenda A, and I will refer to that very briefly, skipping through the pages of it, but I want to say this with respect to Curecanti. If the compact of 1922 means anything and the compact of 1949 means anything, then Curecanti must be built. It is the only reservoir that stores water high enough in Colorado for use in Colorado. It puts water above the vast coal fields of the delta area. You have heard of the Petro-Chemical industry. That has been testified to many times here. It puts water in the vicinity of the great uranium deposits and the many other natural resources. I would like to make this simple comparison. About 7

or 8 months ago the Christian Science Monitor put out a story on the hydro development of Russia, and they have a valley over there, I think it is the Urdish River, if I recall correctly, and it is very similar to this Colorado River Basin. They have identically the same minerals and metals that we have in the Gunnison Basin and they are proceeding as fast as they can to develop those things.

I want to repeat, Curecanti is the only dam that stores water sufficiently high in Colorado for use in Colorado. Colorado gets approximately 51.745 percent. That is about 3,800,000 acre-feet, although we are told there is not that supply available. This is for consumptive use. We are presently using roughly a million and a half feet. That leaves us 2,300,000 to go.

We cannot put 2,300,000 feet of water to consumptive use unless we store in excess of that amount. Curecanti is proposed in the bill as 940,000 acre-feet.

I ask very seriously your consideration of this and ask you in your wisdom to find the means to give us that end. If you do not, then the compact of 1922 is meaningless.

Senator ANDERSON. Excuse me a minute. I am very much interested in what you say, and I do not want to find myself quarreling with you, but I am interested in that last statement. The Curecanti you say stores 940,000, and you have at least a million and a half by the smallest calculations and you say 2,300,000 acre-feet to go. Are there no other reservoirs that will supply water for irrigation?

Mr. CORY. In Colorado?

Senator ANDERSON. In Colorado. What about the Crystal Reservoir?

Mr. CORY. The Crystal Reservoir has more or less—well, if you are going back to the original bureau report, it is there, yes. The Crystal Reservoir has not been passed by the Colorado State Water Board. It is not an official recommendation of the State. I am speaking, Senator, of those things that are pertinent before us as far as the State of Colorado is concerned.

Senator ANDERSON. What is in Senate 1555? Curecanti is in that.

Mr. CORY. Curecanti is in it. Flaming Gorge, Echo Park, Glen Canyon, Navaho.

Senator ANDERSON. I have a slight interest in that. But I mean Curecanti is in the bill as it is before the Senate.

Mr. CORY. Correct.

Senator ANDERSON. What I am trying to find out is are you satisfied with the language in Senate 1555 on that subject, or do you think additional dams need to be mentioned?

Mr. CORY. I am satisfied insofar as the Gunnison Basin is concerned, with the language of this bill. As far as the State of Colorado, there should be additional dams. The Gunnison Basin is just a portion of the State, and Curecanti will be located at the head of the Gunnison Basin.

Senator ANDERSON. But I am trying to see how far we can get on the language of the original bill. If you have been here, you know I have some interest in seeing the Navaho project as a participating project. The bill carries Curecanti as a participating project. Are you satisfied that language would permit the initial construction of Echo Park, Flaming Gorge, Glen Canyon, Navaho, and Curecanti?

Mr. CORY. Yes.

Senator ANDERSON. Thank you.

Mr. CORY. In this whole thing, if in the work I have done in it, there has been any value, it might be that going out and trying to find out the practical truth as it affects the average citizen. I operate the radio station at Craig and am very much interested in that area also, and I became disturbed when there was a lot of adverse comment to Echo Park. So we got some good research on it and ran a lot of material for the general public. But I thought it had better be checked on a personal basis. So just last week I took my two sons—previously we had tried to go in that, I will say, but we had been in the family passenger car and couldn't make it.

Last week I took my two sons, with a four-wheel drive jeep station wagon, and we planned to get out of Craig early. We bumped into some difficulty. The people there said you can't just get in that jeep and go to Echo Park. You have to have 5 gallons of spare gasoline, you have to take along drinking water, you have to have sleeping bags. You better get several days supply of food.

I went around and heeded their advice and got all of these things, even including mosquito repellent. We didn't run into any mosquitoes. That was the only thing we did not need.

Senator WATKINS. What time of year was it?

Mr. CORY. This was 4 days ago, Senator. We left for there last Thursday, a week ago. We got out on Saturday. But we finally got out there on Highway 40, heading toward Vernal or Jensen, Utah, we left from Craig, and we had been advised to go in on Highway 14, County Road 14, which we were told was 6 or 7 miles beyond Elk Springs.

We found out it wasn't, it actually takes off at Elk Springs. I simply tell you that to point out that even the local people do not know exactly how to get into that monument.

Senator ANDERSON. I take it it is not overrun with tourists.

Mr. CORY. I will come to that. It definitely isn't. We got on Highway 14, and we drove in about 4 or 5 miles, we passed 2 forks in the road, and we did not see a sign directing which fork to take. We got out the sleeping bags and went to bed. The next morning we were up at 4:30, went back to Elk Springs and after inquiring of several people finally found a man who had been into the monument. He said he would go with us. We left again, we drove 17 miles, did not see a sign, until we came to a weather-beaten sign put up by the Park Service some time ago. It is not shellacked and kept in good repair as the Park Service signs ordinarily are.

We proceeded on into the monument. We drove 40 miles and got to Mantle's cabin. This road was rocky, narrow, very difficult. I had to put the jeep in four-wheel drive, drop it into compound in order to negotiate it, and even so tore some rubber out of the tires on the rocks.

Senator WATKINS. You got into what they call the low-low.

Mr. CORY. That is right. We got into Mantle's cabin and there we saw water, the first water that we could have put into the radiator, and it took us a little over 4 hours—4 hours, 20 minutes—to go the 40 miles.

We did stop at one point for about 10 minutes along the way. The Park Service map, and if you want to get one it is a matter of record,

I looked at the map. We tried to use it, the Park Service map shows no road between the Mantle cabin and what is called Chew's ranch. However, there is a road between the two. You don't have to come back out on Highway 14 or on County Road 14, you can go over on a little connecting road. We took that, went down to Chew's cabin, went on to Echo Park, down to Pat's Hole. You know, they tell the story of how Pat Lynch, the old hermit down there, used to yell when he went out of that area, and would say "Stay out of here you so and so's," and it would echo for 4 or 5 days until he got back. It must still be echoing, because we were alone down there, and there was simply no one there. We checked the register there and found out that approximately 18 or 19 tourist parties had been in there this year, about a hundred people.

Now, Senator, I want to point out that by now we had driven 55 miles in the monument and we had not seen a moving vehicle, we had not passed an automobile, nor had an automobile passed us, nor had we seen any but the two vehicles that belonged to the Mantles, their pickup and jeep, parked at their ranch. We came out of Echo Park, went back up to Harper's Corner. We saw one vehicle on this trip, it was a Government jeep with two men in it. We got up on Harper's Corner, looked into the Lodore and Yampa Canyons, and I can't say that from up there with those canyons being two or three thousand feet deep, two or three hundred feet of water is going to change them.

Looking down into the canyon you can't tell whether the river is running five or six thousand second-feet or whether it is running, from those heights. You just don't know.

We came out of there, and we were in the monument or the approach roads to the monument, for 120 miles and we did not pass a single vehicle. We saw one vehicle moving, we saw one parked car that belonged to outsiders, and that was a California car. We found the people out on the trail and talked to them for a moment, asking "Where are you from? What do you do?" and she said, "I am an employee of the Sierra Club."

Those were the only people we saw.

Senator WATKINS. May I observe, you cannot have the wilderness if you have thousands of people in there.

Mr. CORY. Well, you know there is something about that, Senator, I would like to observe. It seems that any natural area in the country should be available to a man with a family. The children need recreation, too, and only the hardiest type of people could get down there. As a matter of fact, I would say essentially people that would make that a habitual thing are those people who have nothing really important to do at other times.

A national monument should not be maintained as an exclusive club through its inaccessibility. I believe that sums up my thinking on the matter.

Senator BARRETT. May I ask you this question: If the Echo Park Reservoir is constructed, in your judgment would the dinosaurs be more available to the public or less available to the public?

Mr. CORY. You know, Senator, as I have stated, I am in the radio business, and one of the distressing things about it is that we have cultured people who are always seeking a little better in the matter of music than we can put out or that the general public likes. We say

in radio that they are the musicologists, those people who are always waiting for the wail of the flute or horn to answer the distress of the bassoon.

They are looking for subtlety that does not exist. I can say with respect to those dinosaurs and that kind of thing I think those people are looking for subtleties that really don't exist.

The construction of that dam would make that one of the best recreational areas, if not the best, in the United States. Access roads would be available, the water would be still, fishing would undoubtedly be created. Take the case of the TVA, and Senator Anderson, in your own State, the construction you have had there, you know what it has done for fishing. What were predicated to be biological deserts have increased the yield of particular streams and areas from 100 to 1,000 times.

That would be a tremendous thing if you got it. We went on down to the museum, saw that, and all of the dinosaur remains, of course, are below where Echo Park Dam would be.

Senator ANDERSON. Downstream, do you mean?

Mr. CORY. Let me explain it this way, sir: As you stand on Harper's Corner and look down, you can see the site for the Echo Park Dam. About 17 miles, airline, from that downstream, is the museum, and the dinosaur bones are actually at the museum location. There is no connection between Echo Park and inundating dinosaurs.

Now if you would go to page 2 of the first addenda, you will see that that shows the participating projects, county by county, under the Curecanti development. I will go along very quickly here, in the interest of conserving time.

Now if you will turn over to page 7 of that addenda, you will find a chart there which should be folded out. That chart has to do with the increased value of farmlands, buildings, anticipating full development of the Gunnison River project and all the participating projects. To my knowledge this is the only study that has been made in trying to determine what would actually happen to the economy of an area. We dealt with only those industries that were established in the area, principally agriculture and livestock, and we showed what would happen on the county tax level, we showed what would happen in cases of retail trade, we showed what would happen in the valuation.

Senator Anderson, for the past 2 days you have been hitting at a very interesting point. You have talked about the return to the Federal Treasury in income taxes. We did not project our study to that length.

Senator ANDERSON. All you can say is that if the cost of the dam comes back to the Federal Treasury and the cost of all your irrigation works comes back to the Federal Treasury in payments by the farmers or from power revenues of the dams, that on top of that there will also come back all costs 2 or 3 more times in the next 50 or 100 years from the income tax of the people who live under it. An expanding economy is what we definitely need. That is part of the benefits that the Bureau of Reclamation cannot measure, because it is not required to measure them. But it is a very important part of it, and sometimes I think a more important part than the actual payment the irrigation farmer can make for his water, because that would be in competition with other types of water of which he might avail himself.

Senator WATKINS. May I add to that, of course, the expanding population. It is estimated within 15 years we will have 200 million people in this country.

Mr. CORY. By 1975, if the gradient holds, we will have 225 million.

Senator ANDERSON. I was being too conservative.

Mr. CORY. You have reminded me of a point, Senator, and I think that definitely this should interest the gentlemen of Congress.

Our increase in population matched that of the Nation roughly from 1900 to 1930. Then we started to slip behind. The Uncompahgre Valley was the last land frontier, I understand, in the United States. The young men came in and they took water out as far as they could by laterals. In 1888 that river was fully appropriated. The point I make is that opportunity ceased and our population became static.

We have not increased in the decade from 1940 to 1950. We had 1 percent decrease while the rest of the Nation went forward 20 percent. We are now faced with the proposition of finding the best place to which to export our children. That is pretty serious, when you can't keep your sons around you.

Senator WATKINS. That is because of lack of opportunity.

Mr. CORY. Lack of opportunity. It simply doesn't exist.

Senator WATKINS. It doesn't exist in Utah, either. We have sent out many of our fine young people. We have the cost of educating them, rearing them and taking care of them and when they get to the age where they start their families, they have to move, and they will add to the problems in other areas as our Nation's population increases. So any intelligent planning in this country must take into consideration the needs for new homes, new opportunities, for our people, and that is a pressing problem, even now.

We are increasing very rapidly in this country. In fact, if we continue to increase as we have increased in the past we will have a large population with which we will not know what to do, unless we take the necessary steps now.

Mr. CORY. Bearing on that point, Senator, you will notice on the chart on page 8 or 7 that this project in its entirety will provide about 1,170 new farm homes. That will provide ample opportunity for service industries and other things.

Senator WATKINS. I would like to ask you about another matter in connection with this. It has been said repeatedly that the power users are going to subsidize the irrigation users. You have been making these investigations and know that on the average farm in the United States the farmers actually use more electricity than do the average city homeowners. Haven't you found that to be a fact?

Mr. CORY. Definitely.

Senator WATKINS. They use it for a lot of things in helping to do the chores around the farm. They use it in connection with grinding grains, and with irrigation pumps and sprinklers on some farms, and numerous other ways.

You can run through a whole list which is probably pretty well known to the average farmer but is not too well known to the average city Congressman or Senator who does not know what must be done on the farm.

So of the power users, more power, per capita is used by the farm people than by the ordinary urban people.

Mr. CORY. That is definitely true.

Senator WATKINS. The people will be subsidizing themselves and helping to subsidize themselves, if that is what they mean. No other class off by itself is going to subsidize the poor farmer, poor irrigator.

Mr. CORY. You don't ever in a strict sense subsidize the basic industry of the Nation, which is agriculture. Let me make this comparison: During the war years I happened to be on Okinawa, and I saw firsthand the pitiful state of a population that can no longer produce enough for itself, and our security at the present time is totally dependent on an expanding economy, until by techniques of good management, we learn to conduct our affairs differently.

Senator, to go ahead here, if you will see that we proceeded to make a breakdown on the actual way this money would be spent in the area, what the costs are on the dam would be. Turning over to the next chart, we define that further. That is page 13.

Turning on to 14, we show the actual breakdown in dollars and by percentages.

Turning to 15 we come to a very important thing to the eastern part of the United States. Let's take for example housing, fuel, light, refrigeration, the second item there, on page 15 of the addenda.

We will take 13.2 percent of the total salary income. That will be an expenditure during those years of \$4,101,000 on those items. We buy most of the material for that type construction from the east, from the heavy populated areas. You follow it down and you will find the distribution all the way through. Of course, I cannot take time to go to that now, but I would recommend it for careful study by your staff in recommendations to you.

Now if you will turn to page 20 of this addenda and go to the last column and to the total of that column, you will notice that the increase in the total income of the area will be 12,123,000. That is based on the income to the farms. That is not based on construction costs of the dam or anything of that type. That is an annual income that will result and will remain. I think anyone who thinks we are someday not going to need all the foods we can get, need only see the projected population increases to realize we will.

On the next page, chart 21, we show an allocation of the annual farm expenditures and how they will go into the economy of the local area of the Nation.

I think that I can sum up by asking you to turn over to page 27 of that addenda. There you see a summary of the gross annual income for the area. The gross annual income will be increased, if you go to the last column and take that last column, \$21,738,000. That is what we are talking about when we speak about what this will mean in the livelihoods of people. There is an addenda B, to this one which I will make only this comment, if you find addenda B at the end of A there, 34 being the last page of addenda A.

I happened to hear that one of the conservationists and one highly regarded, the Honorable Tom Wallace, editor emeritus of Louisville Times, was planning a march of 100,000 people on Washington to protest the Echo Park. I wrote him a letter, having these interests in western Colorado, wrote him a letter inviting him to be my guest, to make a march on Echo Park before he marched on Washington.

Senator WATKINS. To come by way of Echo Park?

Mr. CORY. Yes.

Senators, you simply read the exchange of correspondence and I think the picture will be clear to you. I will not comment on that any more.

In all fairness, there is one thing I have to say before you as a result of previous testimony and I don't in any sense wish to appear as a *persona non grata*. But I do want to say this, that I was a member of the Colorado Conference Committee which worked for 10 months to help with the Hill report that has been quoted to you earlier. As a matter of fact, Representative Frank Meeker and I sat in a hotel room in Denver and pounded out on an old typewriter his first copy of the bill that he introduced to get the money from the State legislature to make that study. And as a member of that committee, I went into it in an effort to reconcile our differences in Colorado. It was my understanding, carrying an olive branch for western Colorado, that we were going to consider western Colorado as one large map. In those areas where we had complete information on the supply of water, and the potential application of that water, and its present uses, we were going to put those in white. We were going to shade that down until we came to blackout areas where we had no information.

I want to say that our committee did not develop that information. In fairness, that is an issue that must await further complete surveys. It is an issue that should be resolved in Colorado.

I heard this morning about the vote on it, I was present when those votes were made, and they were made strictly along the Continental Divide. I think that is a matter in which we must eventually achieve unanimity.

Senators, I thank you very much for the privilege of appearing before you.

Senator WATKINS. Thank you.

Senator ANDERSON. I want to say that I enjoyed your statement very much. That is the first information of that type that we have had from that area. I don't refer to the Colorado area, I refer to the difficulty of getting into Echo Park.

Mr. CORY. You can get into Colorado. Come and visit us.

(Mr. Cory's statement follows:)

STATEMENT OF GEORGE CORY

I am George Cory of Montrose, Colo., and am in the radio broadcasting business. My experience in water matters has been gained as a member of local, area, and State water committees.

My remarks are in consonance with the belief that this Senate committee, its counterpart in the House, and the Congress in general through previous action, hold as valid two basic premises:

1. The Colorado River Compact of 1922 is the framework by which we have and will abide in developing to full consumptive use the waters of the Colorado River Basin in both the lower and the upper basins.

2. The upper Colorado River Basin compact of 1949 is the framework by which we have and will abide in developing to full consumptive use the waters of each upper basin State.

Now, the language of those two compacts can be considered as specific, therefore, we have a mandatory duty to accomplish the end purpose of each compact by the best means available to us.

The people of my area respectfully ask your consideration especially of the Curecanti project and the Echo Park project in the initial phase of construction. We ask too the earliest practical development of the participating projects of western Colorado on which adequate surveys have been made and a set method for going forward with survey work on all other portions of western Colorado where information is now inadequate.

We support Curecanti and Echo Park as they are presently in the Senate bill.

The House committee voted favorably on Curecanti although there is a question whether Curecanti meets the criteria of A-47 promulgated in the early part of this year. The Montrose and Delta County water committees are not in agreement with A-47 and on June 1 submitted through the Colorado Water Board a request to the Bureau of Reclamation to advise on methods that may be used in determining additional benefits on the Curecanti Reservoir through consideration of irrigation, flood control, industrial uses and general economic benefits, and recreation, with an answer on a possible target date for such information to be given at the earliest possible time.

Mr. E. O. Larson, Bureau of Reclamation regional director in Salt Lake City, has replied in part as follows:

It is our plan in analyzing the optimum plan of development for the Curecanti Reservoir to consider the benefits as outlined in the resolution. To accomplish this we have asked the National Park Service to analyze the recreational values, the Fish and Wildlife Service to evaluate the damages and benefits to fish and wildlife and the Corps of Engineers to evaluate the flood-control benefits. * * * The Bureau will make the appraisal of the irrigation and power benefits that might be associated with the development.

The committee will note that Mr. Larson does not mention the "industrial uses" and "general economic benefits" which were a part of our resolution. The Montrose and Delta water committees 2 years ago turned out a comprehensive report which had as its principal content these very subjects. We spent approximately \$5,000 for the services of the Bureau of Business Research of the University of Colorado, an engineering firm and an accounting firm in helping us evaluate our work and develop material. Attached as addenda A are excerpts and tables from this report. The committee is respectfully asked to consider this approach in determining feasibility, and to press, by all means open to it, for the broadest possible feasibility reports.

The Gunnison Basin has expanded to the maximum within the normal water flow. We must have storage. We must depend on the wisdom of the Congress to realize that American ingenuity will find a use for its water if it is placed above the natural resources of the Gunnison Basin.

Finally, the construction of Curecanti as one of the earliest units in the initial phase is compliance in only a modest degree with the full intent and purpose of the compacts of 1922 and 1949. We must have, as mentioned before, complete western Colorado surveys for implementation of the compacts.

In establishing the direct water use benefits of Curecanti, I wish to incorporate by reference the testimony of Leonard Kuiper, city manager of Delta, Colo., given before the House Interior and Insular Affairs Committee in January of this year (1954).

At the outset I mentioned Echo Park. Echo Park needs no defense. I would like only to inform the committee of an extensive tour that

I took last Thursday, Friday, and Saturday with my two sons through the Dinosaur National Monument.

We had planned the trip once before but were seriously urged not to attempt it in our regular passenger car. We had skirted the monument for 3 years, but had never made a serious effort to see it. So last week we went back with a four-wheel-drive jeep station wagon.

We left Craig about 3 hours late because first, we had such a hard time in obtaining any information on getting to the so-called points of interest, and secondly having the two boys with me, I heeded the advice of taking along several gallons of drinking water, extra water for the radiator, a spare 5-gallon can of gas, sleeping bags, chains for all 4 wheels in case it rained, a good supply of food and mosquito repellent. It didn't rain so we didn't need the chains and there weren't any mosquitoes to speak of. Everything else came in handy.

It was dark when we finally reached the turnoff point, or what we thought was the turnoff point on highway 40 west of Craig. We tried at filling stations in both Maybell and Elk Springs to get further directions. They weren't forthcoming, at least with any certainty. We took the turnoff indicated on a highway map and in 20 minutes were completely lost due to unmarked forks in the road. We parked, got out the sleeping bags and went to bed.

The next morning we went back to Elk Springs, located a man who had actually been in the monument to serve as a guide and started out again. We drove 17 miles on County Road 14 before coming to a weatherbeaten Park Service sign that identified the boundary of the monument. We traveled another 23 miles to Mantle's cabin on the roughest, narrowest, rockiest road a jeep can negotiate. The elapsed time for 40 miles was over 4 hours. We did not pass a car or vehicle of any kind or see anyone. Not a drop of water was available until we arrived at Mantle's. An ordinary passenger car would have high-centered many times.

We left Mantle's for the Chew's ranch and Echo Park. The Park Service map does not show a road between the two ranches, but actually it was better than the road we came in on. We arrived at Echo Park and Steamboat Rock and had not yet seen a car in traveling 55 miles in the monument. No two-way roads are needed here.

As near as it was possible to tell by the Park Service register at Pat's Hole or Echo Park, approximately 19 car parties had been into the area through June 25 of this year, less than 100 people. They had come in on County Road No. 16 which is slightly better than No. 14 mentioned above.

We traveled on to Harper's Corner, seeing one Government jeep in the late afternoon. We met a man and his wife at Harper's Corner. The woman said she was an employee of the Sierra Club. We left Harper's Corner and drove approximately 40 miles to the main highway.

We did not pass a vehicle in 120 miles on the approach roads or in the monument from 5 in the morning until 11:15 at night.

The dust was terrible. Rain would absolutely maroon any passenger car in the monument section just discussed. It is extremely doubtful if it would be safe, in case of much rain, to travel this road in a jeep with four wheel chains.

Sanding on Harper's Corner and looking down into the approximately 3,000-foot depth of the Lodore, Yampa, and canyons below, it

is hard to conceive that a water depth of 200 to 500 feet would materially change the view.

Presently all but the museum section of the Dinosaur National Monument is accessible only to those people who have adequate expensive equipment. A national monument should not be maintained as an exclusive area through inaccessibility.

Attached as addenda B is a series of correspondence between myself and the Honorable Tom Wallace, whom it is reported planned a march by 100,000 people on Washington protesting Echo Park. It is believed that a review of these letters will in a small degree place the problem in practical focus.

ADDENDA A

SECTION I, ARTICLE E—GENERAL ECONOMY

The general economy section of this report was compiled and written for the purpose of eliminating guesswork, rumor, and distortion of facts in consideration of Curecanti as it will effect the economy of the Gunnison Basin.

It was necessary to consider the effect of Curecanti (a) during the construction period, and (b) during the post construction period. Background statistics were compiled and related in dollar figures to the Gunnison Basin projects. Previous considerations of Curecanti have been so limited in scope that no cognizance was taken of the distribution of the money spent in the area for construction. The building of new farmhouses, the additional income from crops and increased cattle production were not considered.

This report on general economy sets forth in considerable detail the breakdown costs, the allocation of project payroll to various types of consumer expenditures, the breakdown of participating projects costs and the allocation of participating projects payroll to various types of consumer expenditures. The capital farm increase as a result of construction of Curecanti and its participating projects is developed. The allocation of annual farm expenditures at the retail level is projected. And, many other significant economic factors are brought to light.

The studies from which these facts and estimates were obtained depend upon official data for their basis. In developing this section we have taken a positive approach to the question of, What does Curecanti mean to the area?

TABLE B-7.—Totals, all counties under Curecanti development

Project	Costs	Irrigated new lands in acres	Irrigated lands supplemental in acres	Capital costs new land per acre	Capital costs supplemental per acre	Total annual costs per acre	Repayment capacity per acre	Ratio benefits to costs per acre	N. me of reservoir
Delta County.....	\$43,682,000	22,500	45,485	.....	.....	.....	.....	.....	.....
Gunnison County.....	26,216,000	39,370	28,420	.....	.....	.....	.....	.....	.....
Montrose County.....	24,978,000	14,600	10,850	.....	.....	.....	.....	.....	.....
Mesa County.....	5,720,000	5,570	3,320	.....	.....	.....	.....	.....	.....
Ouray County.....	10,760,000	10,750	3,905	.....	.....	.....	.....	.....	.....
Small-scale development.....	.....	8,000	.....	.....	.....	.....	.....	.....	.....
Saguache County.....	7,182,000	6,780	5,190	.....	.....	.....	.....	.....	.....
Total.....	89,265,000	107,570	96,360	.....	.....	.....	.....	.....	.....

NOTE.—We have left out 1,230 acres of supplemental land in the North Delta project which is presently irrigated and 110 acres under Cebolla which will not be included.

SECTION 1, ARTICLE B, POINT 3—NEW FARMS CREATED BY PARTICIPATING PROJECTS

There follows under this portion of the report two tables which are designated as follows:

Table 1-B-3a and table 1-B-3b.

Each of these tables is preceded by an explanation of the table's purpose.

Factual, official information has been used at the conclusions set forth in the tables. All values have been determined on the belief of 100 percent completion of the entire Gunnison River project.

Increased value

Farmlands, buildings, implements, machinery, and livestock with full development of the Gunnison River project in the following counties: Gunnison, Montrose, Delta, Mesa, Ouray, and Saguache.

In the following table each county is handled separately. The year 1945 is used in arriving at values, the latest year for which figures are available from the Bureau of the Census.

The legends used on the table are as follows: 1. Colorado Yearbook, 1948-50. 2. Gunnison River Project Colorado No. 48a, 82-0, the Jex Report. 3. Best available reports from experts in the field such as the county agent, civil engineers, etc.

The column headings are self-explanatory except as listed below:

6. Average irrigated acres per farm: Obtained by dividing the total number of farms of a county into the irrigated acres of the county.

7. Size and number of new farms made possible by project: Due to the lack of dry farming land in these counties it is assumed that the additional acres of land on a farm in excess of the irrigated land is grazing land. The average number of acres of grazing land per farm has been determined. The assessed valuation of grazing land has been compared with that of irrigated land to arrive at the approximate worth of grazing land to a farm. The worth thus established is translated into irrigated acres and added to the average "irrigated acres per farm" to make the worth of the "new farms" equal to "average farms" now in existence in the counties.

The above procedure compensates completely for the smaller size of the new, completely irrigated farms. This new number of farm units is even more conservative when it is considered that additional grazing lands adjacent to them will be utilized. It is impossible to determine the amount of these grazing lands so they are not being computed in this report.

It is to be noted that the value of the land is tied directly to assessed valuation, which is a most reliable criterion. The material used in establishing the number of new farms made possible by the Gunnison River project was taken from the Colorado Yearbook, 1948-50, and the Gunnison River project, Colorado No. 48a, 82-0 (Jex Report).

8. Increased value of lands and buildings.

9. Increased value of implements and machinery.

10. Increased value of livestock: Obtained by applying the percentage increase of new farms to the actual 1945 value of lands and buildings on farms, of implements and machinery on farms, and of livestock on farms, as shown by the 1948-50 Colorado Yearbook.

11. Number of acres supplied supplemental irrigation and value increased caused by supplemental irrigation: There follows a letter from the Montrose County agent, who did research in arriving at the increased valuations caused by supplemental irrigation. His recommendations have been used in determining such values. It will be noted that no increase was used in farmland and buildings, in farm implements and machinery—that only a 50-percent increase in livestock valuation is used, thus making the report very conservative.

13. Additional tax levies: The Montrose County assessor supplied the information that the average mill levy for all counties considered in this report was approximately 45 mills. Considering, however, that increased valuation would cause a lowering of mill levy, a 40-mill levy is used in arriving at the additional tax revenue to each county, when the Gunnison River project is completed. The abstracts of assessments for the various counties may be examined to support the correctness of the 40-mill levy.

1. See section VI—Letter 7.

GENERAL COMMENTS ON TABLE 1-B-3A

In developing the figures on new farms arrived at in column seven of this report, the writer was aware of these discrepancies: (1) Land taken out of use because of rights-of-way was not considered; (2) land taken out of use because of the home and barn site was not considered; (3) the dry acreage converted to irrigated acreage was not deducted. The total of these three factors were computed and did not exceed more than a 3-percent loss. Due to the difficulty of obtaining any official data, and the small percentage involved, these computations were not made in arriving at the final figures; (4) the additional grazing land adjacent to the participating projects was not considered. It is estimated that these additional grazing lands will compensate to some degree for the preceding three points.

TABLE 1-B-3-a.—Increased value of farmlands, buildings, implements, machinery, and livestock, with full development of the Gunnison River project in the following counties

Counties	(1) Farmland and buildings (1)	(2) Farm implements and machinery (1)	(3) Livestock on farms (1)	(4) Total	(5) Irrigated		(7) Average size and number of— Irrigated new—farms made possible by project (1-2)	(8) Increased value of farmland and buildings	(9) Increased value of farm implements and machinery
					Number of farms (1)	Acres per farm (1)			
Gunnison.....	\$4,359,028	\$402,420	\$2,500,576	\$7,262,024	258	139	198 acres, 200 new farms, less 15 percent (170)	\$8,356,451.56	\$309,803.40
Saguache.....	6,846,548	781,207	2,529,898	10,157,743	359	200	323 acres, 21 new farms	410,792.88	46,877.82
Montrose.....	10,024,203	1,339,640	3,644,289	15,008,132	1,486	575	68 acres, 214 new farms	1,503,630.45	200,946.00
Delta.....	11,726,982	1,382,028	3,077,066	16,186,076	1,086	36	40.5 acres, 555 new farms	3,869,904.06	456,069.24
Ouray.....	1,350,170	131,956	648,849	2,130,975	118	95	166 acres, 65 new farms, less 11 percent (58)	742,583.50	72,575.80
Mesa.....	20,869,024	2,189,259	3,999,883	27,058,166	2,024	36	43 acres, 129 new farms	1,043,451.20	109,462.95
Total.....	55,175,955	6,226,000	16,400,561	77,803,116	6,508	1,147	1,147 new farms	10,926,823.65	1,196,795.21

Counties	(10) Increased value of livestock	(11) Number of acres supplied supplemental irrigation and value increases caused by supplemental irrigation	(12) Total increase in dollars and percentage	(13) Additional tax revenue
Gunnison.....	\$1,925,443.52	28,420 acres.....\$962,721.76	\$6,554,480.24, less 15 percent by inundation, net \$5,571,308.19, 71 percent	40 mills, \$111,426.17; 45 mills, \$125,354.43.
Saguache.....	151,703.88	5,100 acres.....75,806.04	\$685,961.52, 67 percent	40 mills, \$13,707.23; 45 mills, \$15,420.63.
Montrose.....	546,643.35	10,850 acres.....273,321.67	\$2,524,541.47, 15 percent	40 mills, \$50,490.83; 45 mills, \$56,802.18.
Delta.....	1,015,431.78	45,485 acres.....228,034.62	\$5,569,439.70, less 75 percent by inundation, net \$5,527,668.90, 32 percent	40 mills, \$110,553.38; 45 mills, \$124,372.57.
Ouray.....	356,865.95	3,905 acres.....507,715.80	\$1,679,752.14, less 11 percent by inundation, net \$1,494,979.40, 49 percent	40 mills, \$29,899.59; 45 mills, \$33,637.03.
Mesa.....	199,994.15	3,320 acres.....99,997.07	\$1,452,905.37, 5 percent	40 mills, \$29,038.10; 45 mills, \$32,698.37.
Total.....	4,196,173.63	2,147,687.95	Gross, \$18,460,480.44; net, \$17,256,764.85	40 mills, \$345,135.30; 45 mills, \$388,277.23.

Legends: 1. Colorado Yearbook, 1948-50. 2. Gunnison River project, Colorado No. 4-59, 82-0, the Jex Report. 3. Best available reports from experts in the field such as the county agent, civil engineers, etc.
 The valuations shown in this table are from the 1945 census. Had these values been based on 1949 or 1950, additional tax revenue for each county would be increased approximately 35 percent. In figuring additional tax revenue only 1/2 the total increase in dollar valuation was used. This was done on the recommendation of the Business Research Bureau, who pointed out that a study of Colorado counties revealed that assessed valuation equalled approximately 50 percent of actual valuation.

Increased farm income and retail expenditures with full development of the Gunnison River project in the following counties: Gunnison, Montrose, Delta, Mesa, Ouray, and Saguache.

In the following table each county is handled separately. The year 1949 is used in arriving at increased farm, income, and retail expenditures, the latest year for which figures are available.

The legends used in the table are as follows: 1. SRDS Consumers Markets 1950-51 (Consumers Markets is recognized as a national authority in reporting factual information on every county in the United States. The official source of all data is given in the opening pages of Consumers Markets). 2. Colorado Yearbook, 1948-50. 3. Gunnison River project, Colorado, No. 4-8a. 82-0, Jex Report.

All column heads have been numbered for ease of examination in determining how figures were reached. Column heads are self-explanatory, with the exception of columns 6 and 11. The explanations follow:

6. Additional farm income from supplemental irrigation to present land: Income in this column was arrived at by: (1) Considering the worth of supplemental irrigation per acre at 50 percent of a newly irrigated acre; (2) translating supplementally irrigated acres into farm units and dividing by 2 to arrive at 50 percent value; (3) multiplying the number of units established in 2 above, by the income per household in column 2.

11. Additional farm retail expenditures from supplemental irrigation to present land: Expenditures in this column were arrived at by: (1) Considering the worth of supplemental irrigation per acre at 50 percent of a newly irrigated acre; (2) translating supplementally irrigated acres into farm units and dividing by 2 to arrive at 50 percent value; (3) multiplying the number of units established in 2 above by the expenditures per household in column 8.

TABLE 1-B-3-h.—Increased farm income and retail expenditures with full development of the Gunnison River project in the following counties

Counties	1	2	3	4	5	6	7	8	9	10	11	12
	Households on farms (1)	Income per household (1)	Total farm income (1)	Additional farm households resulting from project (3 and 3)	Additional farm income resulting from "new farms" (cols. 2x4)	Additional farm income from supplemental irrigation to present land	Total farm additional income (cols. 5 and 6)	Expenditures per household (1)	Farm retail expenditures (1)	Additional farm retail expenditures resulting from "new farms" (cols. 4x8)	Additional farm retail expenditures from supplemental irrigation to present land	Total farm expenditures (10 and 11)
Gunnison.....	320	\$9,653	\$3,089,000	170	\$1,641,010	\$692,796	\$2,333,906	\$5,916	\$1,898,000	\$1,005,720	\$425,952	\$1,431,672
Saguache.....	490	12,188	5,850,000	21	255,948	97,918	353,866	6,250	3,000,000	131,250	50,000	181,250
Montrose.....	1,710	6,150	10,516,000	214	1,316,100	490,647	1,906,747	3,173	5,425,000	679,022	253,840	932,862
Delta.....	2,080	6,035	12,553,000	555	3,349,425	3,388,954	6,738,379	3,940	7,364,000	1,964,700	1,989,490	3,954,190
Ouray.....	170	6,018	1,023,000	88	349,044	70,772	419,816	5,312	903,000	308,098	63,744	371,844
Mesa.....	3,140	5,754	18,067,000	128	742,266	222,162	964,428	3,275	10,285,000	422,476	127,725	550,200
Total.....	7,900	.....	51,086,000	1,146	7,653,493	4,963,249	13,581,470	.....	28,870,000	4,511,263	2,910,741	7,422,004

1948 figures. The official source of all data is given in the opening pages of Consumers Markets, 1940-51. (Consumers Markets is recognized as a national authority in reporting factual information on every county in the United States. The official source of all data is given in the opening pages of Consumers Markets, 1948-50. 3. Gunnison River project, Colorado, No 4-56, 82-0, Jex Report.

TABLE E-26.—Estimated percentage breakdown of total project cost

Item:	Percent of total cost
Payroll.....	30-35
Equipment ¹	15-18
Maintenance, repair, and operation of equipment.....	12-15
Permanent materials.....	25-30
Overhead.....	2-12

¹ Includes interest, insurance, taxes, and depreciation. Of the total equipment cost, 2 percent is estimated as taxes, 2 percent as insurance, and 6 percent as interest.

Source: Rhoades, W. C., licensed engineer, Horner & Switzer, Construction Co., Denver, August 1951.

TABLE E-27.—Estimate of breakdown of Curecanti project costs

Item	Estimated cost	Source of estimate	
Costs, in terms of 1949 prices:			
Reservoir and dam.....	\$66,691,000	U. S. Bureau of Reclamation, "Colorado River Projects and Participating Projects, Upper Colorado River Basin," Project Planning Rept. No. 4-82, 81-1.	
Blue Mesa powerplant.....	5,520,000		
Transmission system.....	7,290,000		
General property.....	900,000		
Total cost estimate.....	80,391,000		
Less:			
Right-of-way.....	700,000	W. C. Rhoades, licensed engineer, Horner & Switzer Construction Co., Denver, August 1951.	
Powerplant equipment.....	2,548,000		
Balance to be allocated.....	77,143,000		
Increase to correspond to current prices (18 percent).....	13,886,000		
Cost in current prices.....	91,029,000		
Breakdown of costs:			
Payroll (33.3 percent).....	30,313,000		
Equipment (16.7 percent).....	15,202,000		
Maintenance, repair, etc. (14 percent).....	12,744,000		
Permanent materials (28 percent).....	25,488,000		
Overhead (8 percent).....	7,282,000		
Breakdown of equipment cost.....			
Insurance.....	276,000		
Taxes.....	276,000		
Interest.....	830,000		
Depreciation.....	13,820,000		

TABLE E-31.—Estimate of breakdown of Curecanti and participating project's costs

Item	Estimated cost	Source of estimate
Total cost, Curecanti, and participating projects.....	\$166,243,000	U. S. Bureau of Reclamation, "Colorado River Projects and Participating Projects, Upper Colorado River Basin," Project Planning Rept. No. 4-82, 81-1.
Increase cost 18 percent to correspond to Curecanti price.....	193,379,000	
Breakdown of costs:		
Payroll (33.3 percent).....	64,396,000	W. C. Rhoades, licensed engineer Horner & Switzer Construction Co., Denver, August 1951.
Equipment (16.7 percent).....	32,398,000	
Maintenance, repair, etc. (14 percent).....	27,073,000	
Permanent materials (28 percent).....	54,146,000	
Overhead (8 percent).....	15,470,000	
Breakdown of equipment costs.....		
Insurance (2 percent).....	620,000	
Taxes (2 percent).....	620,000	
Interest (6 percent).....	1,862,000	
Depreciation (90 percent).....	29,296,000	

TABLE E-28.—Allocation of Curecanti project payroll to various types of consumer expenditures

Item	Percent of total income ¹	Estimated expenditures ²
Food.....	24.6	\$7,457,000
Housing, fuel, light, and refrigeration.....	13.2	4,001,000
Household operation.....	3.9	1,182,000
Furnishings and equipment.....	5.8	1,758,000
Clothing.....	10.7	3,243,000
Transportation, auto and others.....	11.1	3,365,000
Personal care.....	1.9	576,000
Medical care.....	5.4	1,637,000
Recreation.....	3.2	970,000
Tobacco.....	1.2	364,000
Reading.....	1.5	212,000
Education (formal).....	.3	91,000
Miscellaneous.....	2.2	667,000
Gifts and contributions.....	3.9	1,192,000
Insurance.....	4.2	1,273,000
Net surplus.....	0	0
Personal taxes.....	7.6	2,304,000

¹ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with 2 or more persons in 1948. The average of all income groups receiving less than \$10,000 used in this computation.

² Based upon the total estimated project cost made by the Bureau of Reclamation and increased to current price levels as recommended by W. C. Rhoades, Horner & Switzer Construction Co. Payroll estimated as 33.3 percent of total project cost as suggested by W. C. Rhoades.

TABLE E-29.—Estimate of breakdown of participating project's costs

Item	Estimated cost	Source of estimate
Cost participating projects.....	\$89,000,000	U. S. Bureau of Reclamation, "Colorado River Projects, Upper Colorado River Basin," Project Planning Rept. No. 4-82, 81-1.
Increase cost 18 percent to correspond to current prices.....	102,350,000	
Breakdown of costs:		
Payroll (33.3 percent).....	34,083,000	W. C. Rhoades, licensed engineer, Horner & Switzer Construction Co., Denver, August 1951.
Equipment (16.7 percent).....	17,196,000	
Maintenance, repair, etc. (14 percent).....	14,329,000	
Permanent materials (28 percent).....	28,658,000	
Overhead (8 percent).....	8,188,000	
Breakdown of equipment costs.....	17,196,000	
Insurance (2 percent).....	344,000	
Taxes (2 percent).....	344,000	
Interest (6 percent).....	1,032,000	
Depreciation (90 percent).....	15,476,000	

TABLE E-30.—Allocation of participating project's payrolls to various types of consumer expenditures

Item	Percent of total income ¹	Estimated expenditures ²
Food.....	24.6	\$8,384,000
Housing, fuel, light, and refrigeration.....	13.2	4,499,000
Household operation.....	3.9	1,670,000
Furnishings and equipment.....	5.8	1,977,000
Clothing.....	10.7	3,408,000
Transportation, auto and others.....	11.1	3,783,000
Personal care.....	1.9	648,000
Medical care.....	5.4	1,840,000
Recreation.....	3.2	1,091,000
Tobacco.....	1.2	409,000
Reading.....	.7	239,000
Education (formal).....	.3	102,000
Miscellaneous.....	2.2	750,000
Gifts and contributions.....	3.9	1,670,000
Insurance.....	4.2	1,431,000
Net surplus.....	0	0
Personal taxes.....	7.6	2,590,000

¹ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with 2 or more persons in 1948. The average of all income groups receiving less than \$10,000 used in this computation.

² Based upon the total estimated project cost made by the Bureau of Reclamation and increased to current price levels as recommended by W. C. Rhoades, Horner & Switzer Construction Co. Payroll estimated as 33.3 percent of total project cost as suggested by W. C. Rhoades.

TABLE E-32.—Allocation of Curecanti and participating projects payrolls to various types of consumer expenditures

Item	Percent of total income ¹	Estimated expenditures ²
Food.....	24.6	\$15,841,000
Housing, fuel, light, and refrigeration.....	13.2	8,500,000
Household operation.....	3.9	2,852,000
Furnishings and equipment.....	5.8	3,735,000
Clothing.....	10.7	6,651,000
Transportation, auto and others.....	11.1	7,148,000
Personal care.....	1.9	1,224,000
Medical care.....	5.4	3,477,000
Recreation.....	3.2	2,061,000
Tobacco.....	1.2	723,000
Reading.....	.7	451,000
Education (formal).....	.3	193,000
Miscellaneous.....	2.2	1,417,000
Gifts and contributions.....	3.9	2,862,000
Insurance.....	4.2	2,704,000
Net surplus.....	0	0
Personal taxes.....	7.6	4,894,000

¹ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with 2 or more persons in 1948. The average of all income groups receiving less than \$10,000 used in this computation.

² Based upon the total estimated project cost made by the Bureau of Reclamation and increased to current price levels as recommended by W. C. Rhoades, Horner & Switzer Construction Co. Payroll estimated as 33.3 percent of total project costs as suggested by W. C. Rhoades.

Expenditures and payrolls in the preceding tables are the result of the construction. Once the construction is over, obviously these will cease. However, it is estimated that farm incomes and expenditures will increase as a result of the projects. However, before the additional farms made possible by the projects can get into production it will be necessary for the farmers to make certain expenditures for farm building and for farm implements and machinery. In table 33 the increase in value of farm buildings and equipment is presented, being taken from work previously done by Mr. George Cory. The same source estimates that the annual increase in farm expenditures as a result of these projects, will amount to \$7,422,000. In table 34 the allocation of this annual farm expenditure to various types of expenditures is presented.

TABLE E-33.—*Capital farm increase as a result of construction of Curecanti*

County	Increase value of farmland and buildings ¹	Increase value of farm implements and machinery	Increases in total income ²
Gunnison.....	\$3,356,000	\$310,000	\$3,666,000
Saguache.....	411,000	47,000	458,000
Montrose.....	1,504,000	201,000	1,705,000
Delta.....	3,870,000	456,000	4,326,000
Ouray.....	743,000	73,000	816,000
Mesa.....	1,043,000	109,000	1,152,000
Total.....	10,927,000	1,196,000	12,123,000

¹ Column headings and figures corrected as suggested by Mr. George Cory in telephone conversation of Sept. 4, 1951.

² Totals changed as a result of corrections.

Source: Mr. George Cory.

TABLE E-34 (Corrected).—*Allocation of annual farm expenditures*

Item	Percent of total ¹	Expenditures ²
Food.....	24.6	\$1,827,000
Housing, fuel, light, and refrigeration.....	13.2	980,000
Household operation.....	3.9	290,000
Furnishings and equipment.....	5.8	431,000
Clothing.....	10.7	795,000
Transportation, auto and other.....	11.1	825,000
Personal care.....	1.9	141,000
Medical care.....	5.4	401,000
Recreation.....	3.2	238,000
Tobacco.....	1.2	89,000
Reading.....	.7	52,000
Education (formal).....	.3	22,000
Miscellaneous.....	2.2	164,000
Gifts and contributions.....	3.9	290,000
Insurance.....	4.2	312,000
Net surplus.....	0	0
Personal taxes.....	7.6	565,000
Total.....		7,422,000

¹ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with 2 or more persons in 1948. The average of all income groups receiving less than \$10,000 was used in this compilation.

² Total farm expenditures of \$7,422,000 obtained from Mr. George Cory in telephone conversation of Sept. 4, 1951.

TABLE E-36.—Allocation of estimated farm building payroll

Item	Percent of total ¹	Expenditures	
		Payroll, \$1,500,000	Payroll, \$2,000,000
Food.....	24.6	\$369,000	\$493,000
Housing, fuel, light, and refrigeration.....	13.2	198,000	265,000
Household operation.....	3.9	59,000	78,000
Furnishing and equipment.....	5.8	87,000	116,000
Clothing.....	10.7	160,000	214,000
Transportation, auto and other.....	11.1	166,000	222,000
Personal care.....	1.9	29,000	38,000
Medical care.....	5.4	81,000	108,000
Recreation.....	3.2	48,000	64,000
Tobacco.....	1.2	18,000	24,000
Reading.....	.7	11,000	14,000
Education (formal).....	.3	5,000	6,000
Miscellaneous.....	2.2	33,000	44,000
Gifts and contributions.....	3.9	59,000	78,000
Insurance.....	4.2	63,000	84,000
Net surplus.....	0	0	0
Personal taxes.....	7.0	114,000	152,000

¹ Based upon U. S. Bureau of Labor Statistics' breakdown of expenditures for Denver families with 2 or more persons in 1948. The average of all income groups receiving less than \$10,000 was used in this computation.

TABLE E-37.—Estimated annual costs of Curecanti unit

[In December 1949 prices]

Feature	Operation and maintenance	Replacement	Total
Dam and reservoir.....	\$19,000	\$12,100	\$31,100
Powerplant.....	112,900	49,600	162,500
Transmission system.....	102,100	82,400	184,500
Total.....	234,000	144,100	378,100
Allocated to:			
Irrigation and other water-consuming uses.....			18,900
Power.....			359,200
Total.....			378,100

Source: U. S. Bureau of Reclamation, "Colorado River Storage Project and Participating Projects, Upper Colorado River Basin," p. 29 and p. 92.

SECTION 1, ARTICLE F

Recreation

Curecanti.....	¹ \$970,000
Participating projects.....	¹ 1,091,000
Annual farm expenditure.....	² 225,000
Total direct recreation.....	2,286,000
Annual service expenditure.....	225,000
Total direct and indirect recreation.....	2,511,000

¹ During construction period.

² Annual expenditure.

COLORADO RIVER STORAGE PROJECT

Increased farm families, annual recreation

County	Increase in farm population	Percent	Annual recreation expenditure, farm
Delta.....	1,970	48.4	\$108,900
Gunnison.....	604	14.8	33,300
Ouray.....	206	5.1	11,475
Montrose.....	760	18.6	41,850
Saguache.....	75	1.9	4,275
Mesa.....	454	11.2	25,200
Total.....	4,069	100.0	225,000

Increased service families, annual recreation

The same figures that apply above are considered as correct and conservative. Total direct and indirect recreational expenditures reported for increased farm families and increased service force: \$450,000 a year with benefits per county as follows:

Delta.....	\$217,800	Saguache.....	\$8,550
Gunnison.....	66,600	Mesa.....	50,400
Ouray.....	22,950		
Montrose.....	83,700	Total.....	450,000

Colorado tourist spending, 1947 and 1950

Item	Percent of total	Amount, 1947	Amount, 1950
Food.....	23.3	\$51,663,090	\$47,980,292
Accommodations.....	19.0	42,128,700	39,125,560
Clothing and accessories.....	13.0	28,824,900	26,770,120
Gas, oil, and auto expense.....	12.4	27,494,520	25,534,576
Recreation.....	11.0	24,390,300	22,651,640
Public utilities, transportation.....	10.3	22,838,190	21,210,172
Drugs and sundries.....	5.0	11,086,500	10,295,200
Professional and personal services.....	4.0	8,869,200	8,236,960
Laundry and cleaning.....	2.0	4,434,600	4,118,480
Total.....	100.0	221,730,000	205,924,000
SECOND-ROUND DESTINATIONS			
Wholesalers and manufacturers.....	45.4	100,665,420	93,489,496
Payroll.....	23.3	51,663,090	47,980,292
Rent.....	6.3	13,968,990	12,973,212
Depreciation.....	5.2	11,529,960	10,708,048
Heat, light, and power.....	2.1	4,656,330	4,324,404
Advertising.....	1.7	3,769,410	3,500,708
Property taxes.....	1.3	2,882,490	2,677,012
Telephone and telegraph.....	1.0	2,217,300	2,059,240
Laundry and cleaning.....	1.0	2,217,300	2,059,240
Interest.....	1.0	2,217,300	2,059,240
Insurance.....	.8	1,773,840	1,647,392
Office supplies.....	.7	1,552,110	1,441,468
Legal expense.....	.3	665,190	617,772
Profit and all other items.....	9.9	21,951,270	20,386,476
Total.....	100.0	221,730,000	205,924,000
MISCELLANEOUS DATA			
Supports capital investment of.....		368,071,800	341,833,840
Real and personal property tax.....		3,769,410	3,500,708
Gasoline tax.....		3,547,680	3,294,784
Sales tax.....		2,305,992	2,141,610
Game and fish license fees.....		542,020	700,142
Income tax.....		665,190	617,772
Liquor tax.....		399,114	370,663
Parimutuel tax.....			345,000

All percentages obtained from the most exhaustive study to date of the tourist industry made by a private research organization in California, adjusted and applied to total Colorado tourist spending figures. The total value of the tourist industry to Colorado in 1950 was \$15,806,000 below that of 1947, a drop of 7.1 percent. Prepared by Colorado State Advertising and Publicity Committee.

Summary of gross annual income for area

Gross income	Prior to construction of Curecanti and participating projects	After construction of Curecanti and participating projects	Increase
Farm income—increase based on 1,147 new farms and supplemental irrigation.....	\$51,098,000	\$64,679,470	\$13,581,470
Retail sales—Increase based on estimated permanent service population increase of 4,069 persons at average per capita sales for area in 1948 of \$732.52, plus estimated increase of \$1,125,000 for increase in tourist trade of 225,000 persons at \$5 each (does not include additional sales arising from increase in manufacturing or tourist trade payrolls).....	73,505,000	77,610,624	4,105,624
Manufacturing—Increase based on estimated 20 percent increase in light manufacturing due to availability of cheaper power and additional water.....	4,843,000	5,811,600	968,600
Hotels, tourist courts, and amusement—Increase based on increase in tourist trade of 225,000 persons at \$6 each.....	2,522,000	3,677,000	1,125,000
	131,998,000	151,778,694	19,780,694
Power cost: Savings in electric energy costs—decrease based on availability of cheaper power from dam at 1956 kilowatt-hour requirements.....	4,114,319	2,156,792	(A) 1,957,527
Gross annual income for area.....	127,883,681	149,621,902	(B) 21,738,221

NOTE A.—It is assumed that savings realized through cheaper electric energy will result in additional income in the area.

NOTE B.—It is likely that the area will experience some expansion of mine, lumber, and other industry as a result of construction of the proposed facilities, but no figures are included for increased activity from these sources as the amounts cannot be estimated. The proposed projects will make water and electric energy available for synthetic fuel plants, and if development of this nature occurs, trade in the area could easily increase double the figure of \$127,883,681.

NOTE C.—No figures are included for the increased trade activity relative to construction of the proposed facilities. It is believed that trade in the area will increase materially as soon as construction begins, and will remain at a high level throughout the construction period. It is expected that the level of trade from this source will be lower, however, than the estimated permanent annual trade increase of \$21,738,221.

Summary of increase in value of farm property in area

Farm property	Prior to construction of Curecanti and participating projects	After construction of Curecanti and participating projects	Increase
At 1945 values:			
Land and buildings.....	\$55,175,955	\$67,040,751	\$11,864,796
Implements and machinery.....	6,226,600	7,422,395	1,195,795
Livestock.....	16,400,561	20,546,735	4,146,174
Total.....	77,803,116	95,009,881	17,206,765

NOTE A.—It is expected that increase in population and gross annual income in the area will result in an increase in the number and value of business buildings for retail stores, service industry, hotels and tourist courts, etc. Such an increase in trade will probably cause increases in inventories, equipment, and fixtures as well. As a result of increases in farm and retail trading it is believed that there will also be some increase in other personal property in the area. In view of the study made for Grand County—schedule included in this report—it is believed that the area will realize a substantial increase in capital investment if the proposed projects are built.

NOTE B.—Increases in capital investment in the area will probably result in an increase in the assessed valuation for ad valorem tax purposes. It is expected that construction machinery and equipment used to build the proposed projects will increase the assessed valuation of the area by approximately \$750,000 after deduction of the assessed valuation of property taken for reservoir right of way. It is estimated that ad valorem tax levies at 40 mills on the net increase of \$750,000 in assessed valuation will produce additional tax revenues of approximately \$30,000.

SECTION I, ARTICLE D, INDUSTRY

The communities of western Colorado have been slow to develop all of their resources when compared to the communities of eastern Colorado and many other parts of the Nation. This slowness holds advantages and disadvantages. They are as follows: (1) The advantage is that the undeveloped areas can profit from the mistakes of others who have developed faster and further; (2) the disadvantage is that political strength lays with population and more advanced

industry. This gives the stronger ones the advantage to take from the weaker.

This is the position we in western Colorado find ourselves. Transportation, accessibility to markets, and other such economic factors have kept western Colorado in the background industrially up to this time. The more accessible resources were developed and communities grew around this development. This pattern of growth is, of course, apparent to everyone.

This growth of communities in other parts of the Nation, plus the growth of population in the Nation as a whole, plus two major World Wars has placed a heavy drain on the resources of the Nation. This, coupled with the fact that many areas outgrew their resources, makes it necessary now to decide whether or not the people of the Nation want to face the adjustments necessary to stabilize the country as a whole or whether the small underdeveloped areas are to be suppressed in order that the larger, more populated areas can continue to live the life of "Riley" until national disaster occurs.

The pattern of economics in the Nation is so complicated now and the public is so confused that they understand but little of the factors of their existence and future. No wonder that fear and misunderstanding exist. No wonder people develop selfish attitudes which create tendencies to live for today only. Production has been pointed to by many economists as the solution to maintaining our standard of living. Actually there are three factors. They are in order—natural resources, production, and a stable market. We cannot maintain production in the United States without resources. Resources of the Nation and world are being used up at a rapid rate. We, in this area, are fortunate in having many important undeveloped resources. Many of these resources are important to the future national economy. Their development will depend upon available usable water and for that reason we are attempting to argue and plead for fair play in the consideration of the case of water storage in the upper part of the upper basin of western Colorado. We would be pleased to have the following points reviewed before a decision is made on water-storage facilities in the Gunnison River Valley:

1. That the compact of 1922 had as its intent the division of water between the lower and upper basin States and among the States themselves.
2. That this division guarantees the lower basin States a certain amount of water, leaving the upper basin States to divide the remaining amount.
3. That the upper basin States need storage for 48 million acre-feet of water in order to make accessible to them the amount of water supply intended for them in the compact.
4. That this storage is imperative for the growth and development of the upper basin States.

From an economic viewpoint it cannot be denied that it is desirable for each community to develop its industry and agriculture in a diversified fashion and within the limits of the available resources in that area. The extent of such development should depend upon the stable markets for products produced and the amount of resources or resources available.

Some of the communities in the Gunnison River Valley are now evaluating their resources and find that no new permanent industry of any consequence can be established in the area without water storage.

The so-called available water in Colorado exists in that portion of the runoff that occurs generally in the months of April, May, and June. During the remainder of the year the water is fully (or more so) appropriated by existing uses. Thus no storage of water in the upper part of the Gunnison River means no new industry in that area of any consequence because of lack of water for that industry and the population growth resulting therefrom.

5. There has been too much emphasis placed on normal flow in the discussion of available water. Minimum flow figures must be used until such time as adequate storage will allow additional water to become available during periods of drought. Even then it is dangerous to depend entirely upon storage to guarantee any certain amount of water for permanent industry.

An example of this is the Salt River Basin of Arizona. Apparently the people there built up too much hopes in normal flow and storage. Permanent industry was established with the assumption that water was and would always be available. We have all read about the long drought in that area that has now almost ruined the agriculture and industry there. The fact is that new minimum flow records have probably now been established and permanent industry there would have been better off if it had been established more in line with minimum flow rather than normal flow.

The Lee Ferry water measurement in 1934 was 3,966,000 acre-feet. In 1909 it was 23,295,000 acre-feet. The average up to and including 1943 was 14,400,000 acre-feet. Therefore permanent industry must live within the minimum flow until storage makes more water available. Large investments are impossible in the area under such conditions because, as stated before, there is not always enough water now to fill appropriations 9 months out of each year under normal flow conditions.

It would only be practical to assume that under present conditions, with very little water storage, that further diversions from the Colorado River Basin would endanger the entire economy of western Colorado.

To have several years like 1934 would be disastrous if the emphasis is continued on water available as normal flow.

Under State law the western slope can be placed in a squeeze with the east slope on one side and the lower States on the other.

Without proper storage on the west slope, making the surplus water which exists in April, May, and June available to it, the east slope can divert this so-called surplus under State law. If this water that is diverted is placed to beneficial use, it is lost forever to the west slope. This is morally wrong although it may be legal. The only fair thing is to plan usable storage of water for western Colorado and then provide a potential for industrial development of untouched resources on the west slope. If, and only, after the needs of western Colorado are safeguarded, and a surplus then exists in Colorado water, should diversions be considered.

As it now stands, the diversions apparently will be based on surplus water under normal flow conditions which will place western Colorado in a further squeeze during years when the watersheds produce below normal. Eastern Colorado can argue that the east slope might just as well have the water because, according to the compact, "further equitable apportionment" to the Colorado River Basin States can take place after 1963.

In simple words, if we do not get storage in western Colorado very soon, we have lost forever the surplus water that supposedly exists in the water that flows past us in April, May, and June. If this happens, western Colorado cannot grow to any great extent—ever.

6. If western Colorado had little to offer to the wealth of the Nation besides water, it might be planwise to ignore its existence. However, it does have vital resources that will be needed to bolster the Nation's economy. However, these resources cannot serve much use if water is not established for their development. If western Colorado is ignored in matters of water, it may result in many vital mineral resources remaining with Old Mother Nature because of the lack of water to make them available. That will affect the national economy as well as that in western Colorado.

APPENDIX B

MONTROSE, COLO., *May 21, 1954.*

HON. TOM WALLACE,
*Editor Emeritus, Louisville Times,
Louisville, Ky.*

DEAR MR. WALLACE: I have been informed through the wire services that you have proposed a march on Washington by 100,000 persons, protesting what you call "the destruction of the Dinosaur National Monument" in Colorado and Utah, by construction of hydroelectric dams.

My attitude on the construction of a dam in the monument is opposite to yours. I do not believe that the enjoyment of the public domain should be restricted to a few people, as Dinosaur National Monument now is. Roads are now absolutely inadequate. Certainly, you do not believe that the general public should be encouraged to take boat trips through the rapids within the monument, considering the number of fatal and near fatal accidents that have occurred in these rapids.

Perhaps you are unaware that the water height in Lodore Canyon will be only 350 feet if the Echo Park Reservoir is created, while the present canyon walls rise to 3,000 feet; therefore, the diminution is only one-tenth. Also, you may not know that there is more scenery, of the same or even more magnificent character, in the same general area outside the Dinosaur National Monument, than there is within it.

Very likely, you, as myself, have never been in the Dinosaur National Monument. (I planned the trip once with my family but was advised against making it in a regular passenger car.)

Before you march on Washington, I want to provide you the opportunity to visit the Dinosaur National Monument. We could journey into the monument together, each of us choosing an authority on natural history as an advisor, so as to keep any discussion on a factual basis. If you would care to expand the scope of our "personal inquiry," each of us could invite a water engineer of his own choosing.

I would be honored by your company on a trip into the monument territory, and if you are so kind as to accept my invitation, I should like to have you as my guest from the time you arrive in Colorado.

You could travel to Denver by plane or train; then as my guest, journey on to Craig, Colo., by chartered plane, where accommodations would be ready at the beautiful Cosgriff Hotel. Or, you could come to Montrose, Colo., by airline, and we would proceed on to Craig from there. I will provide a four-wheel drive vehicle by means of which we will explore the monument country.

My plan is that we would make a series of tape recordings right on the spot, describing factually, insofar as possible, what the results of a dam and reservoir at Echo Park will be.

I shall anticipate your acceptance and the pleasure of your company.

Most cordially yours,

GEORGE CORY,
General Manager, Community Network.

MONTROSE, COLO., June 7, 1954.

HON. TOM WALLACE,
*Editor Emeritus, Louisville Times,
Louisville, Ky.*

DEAR MR. WALLACE: I am indeed sorry that you have not, as yet, acknowledged my letter of May 21, by accepting the invitation to visit the Dinosaur National Monument. Your response will be deeply appreciated.

Respectfully yours,

GEORGE CORY,
General Manager, Community Network.

THE LOUISVILLE TIMES, Louisville 2, Ky.

MR. GEORGE CORY,
Community Network, Montrose, Colo.

MY DEAR MR. CORY: I didn't answer your May 21 letter because I supposed you were merely daring me to subject myself to the persuasive influence of the visit you proposed. It did not occur to me that you expected me to accept your invitation.

Except that I should enjoy the trip you propose I do not see what would result from it. I know the argument on both sides in the Dinosaur controversy. Seeing what you might show me would not disturb my conclusions. Dinosaur is one of various points of attack. The national reservations are imperiled by eagerness of enterprisers to break in wherever they might. The argument that Dinosaur would not be injured, actually would be improved, by the proposed dams is nothing new in my experience. It is the time-worn recreational paradise argument that is used to popularize projects all over the map.

I thank you for your proffered hospitality. And I would like the visit.

Sincerely,

TOM WALLACE,
Office of the Editor Emeritus.

MONTROSE, COLO., June 21, 1954.

HON. TOM WALLACE,
*Editor Emeritus, Louisville Times,
Louisville 2, Ky.*

DEAR MR. WALLACE: My letter of May 21 was written with the desire to reconcile divergent points of view in a friendly manner. I should like to set definite dates now for your visit. Your statement, however, that seeing what

I might show you would not disturb your conclusions, is hardly in consonance with the purpose for which the invitation was extended.

Could we not approach this problem in a most objective manner and arrive at the same conclusions on the following questions:

1. Is the reservation actually imperiled in any manner?
2. Would any scenery be inundated which is not available in many other places in the immediate vicinity?
3. Would access roads be created which would help the recreational possibilities of the area?
4. Would or would not the lake add a beautiful attraction?
5. Is it not possible that different conditions exist in the case of each project, and to reach a fair determination of each case, the facts pertinent to only that case must be considered?

My mind is not made up on the matter, and I suggest that if you do seriously consider accepting my invitation, that we both arrange to secure competent professional assistants, so that any decisions we reach may be based, insofar as humanly possible, on facts. This entire matter has been too much an emotional situation, without reasonable attention to either the recreational aspects or the economical requirements of a given area.

I sincerely hope that through your acceptance of my invitation that we may perform some service to the people of this area and the Nation.

Cordially,

GEORGE COBY.

Senator WATKINS. The next witness will be Frank Delaney, of Glenwood Springs, Colo.

STATEMENT OF FRANK DELANEY, ATTORNEY FOR COLORADO RIVER WATER CONSERVATION DISTRICT, GLENWOOD SPRINGS, COLO.

Mr. DELANEY. My name is Frank Delaney. I reside at Glenwood Springs. I have prepared and handed to the committee a short formal statement. If it is permissible, I ask leave to file the statement as a part of the record, and in the interest of brevity I shall attempt to comment on the parts which we deem important.

Senator WATKINS. Do you cover all that you want to say in your printed statement?

Mr. DELANEY. Not all.

Senator WATKINS. I was going to say, if you do I think that would be shorter than trying to deliver it orally. We find that often we prepare a statement because we can cut it down about three-fourths by putting it into writing.

Mr. DELANEY. Senator, may I explain, some unusual things arose here since I arrived in the city of Washington and listened to these hearings, an unusual presentation, something that I have not heard before, so it is necessary to make a few comments with respect to that, and I promise you I shall be brief.

Senator WATKINS. You may proceed.

Mr. DELANEY. Our position is stated on page 2 of this statement so far as the main bill pending before this committee is concerned. We favor storage on the Colorado River wherever storage sites may be found to control and equalize the erratic fluctuation in streamflow. We prefer storage as high on the streams as possible, but the sites are not available, storage lower down may serve the same purpose by use of the system of downstream stored water for the direct flow on the upper reaches of the stream.

The district for which I speak does object to the inclusion in this bill of any amendments or proposals for or in aid of the diversion of

Colorado River water from the Pacific slope of the Rocky Mountains to the Atlantic slope.

The reason for that opposition appears in the statement made in behalf of this district at pages 620 to 628 of the hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs of the House of Representatives, 83d Congress, 2d session, on the same bill. The reasons for our opposition to any amendment which will aid exportation of water through the Continental Divide are explained in that statement. We ask that said statement be considered.

Then we summarize the reasons for our opposition to any such amendment. The map before this committee does not exactly illustrate those matters which I wish to call to the attention of the committee. Undoubtedly, many of you have been over the Moffatt branch of the Denver system. If you stand at the town of Kremmling looking east, you will be looking toward the headwaters of the Colorado River. Off to your south the Blue comes in. Then as you proceed up river about 14 miles, the Fraser River comes into the system. The Colorado-Big Thompson project was authorized by the Congress of the United States about 1938. It is for the most part intended to take waters to eastern Colorado. But by this very system of exchange, Senator, which you have mentioned in order to take the low flow of the Colorado River, it was necessary to provide a replacement reservoir, a reservoir to make exchanges from, and that is the Green Mountain Reservoir on the Blue River. In this Senate document which I will not go into except very briefly, there was a provision that a certain amount of the storage of that project was for replacement purposes, to make the exchanges, a certain part was for future development, and it was written right into the Senate document, that a certain part of that reservoir storage was for future development of the western slope.

We made that proposition. It was enacted into this law by the Congress, and the Senate document was the basis of it, and we now say that the proposal made by the city of Denver is not only taking away some of the benefits from the United States, undermining the United States investment, it would undermine this investment.

Permit me to say that the last figures show that the Green Mountain Reservoir is paying into the Treasury of the United States net, after taking out expenses of maintenance, a half million dollars a year. I would say that most of the repayment that has been made on the Colorado-Big Thompson project has come from the revenues derived from the Green Mountain Reservoir. The agreement that was made, and which is embodied in Senate Document 90, is to the effect that the Grand Valley project people down below, other users of water on the western slope, would have the use of that water impounded in that reservoir free of cost.

With that background, I want to say that my further comments will not be on this question, the sectional question that has arisen in Colorado, but will have to do with the national interest as we see it.

We heard mentioned, members of the committee, of uranium, oil shale, the wealth that surrounds Denver. We are proud of our capital city, too, and we want to see Denver develop. But we don't want Denver to develop by getting water which she does not need and which will forever stifle and limit the development of the western

slope where all these great resources are. They have called to your attention that there is an investment of \$378 million in installations, man-made installations, about Denver. Over on the western slope, you have all of the public domain that is in Colorado, practically, with the exception of a little in San Louis Valley, something like 6 million acres; over there you have the naval oil shale reserve, of approximately 100,000 acres, as I remember the acreage; over there is the uranium and over there are three-fourths of the forests; over there we expect development to come, based upon reports from the University of Colorado, men like Mr. Tell Ertle, that may support population of 2 million people, far greater than what there is in the State of Colorado today.

After saying to you that we oppose this because we need that water ourselves, we will make the further assertion, and you will find the figures in the paper that I handed you there to the effect that Denver now has enough water in ordinary years for a population of 775,000, which is approximately 200,000 more than there are there.

These predictions, we say to the members of the committee, that Denver is going up and up on this same straight line, evidenced by the graph of growth of the last few years, is not a dependable prediction because it is the history everywhere, that cities when they reach a population somewhere in that vicinity level off, and the controlling factor is the trade area. Denver has, we think, before this committee a very unusual proposal. And so that you will understand exactly why we fear this proposal, let me call your attention to page 328, the language on page 328, of the House hearings, the statement on the part of Mr. Saunders in which he says the construction of the city's project, the tunnel, a dam at Dillon, and a dam at Two Forks, provides the core of a large Blue-South Platte project proposed by the Bureau of Reclamation, to bring an additional 275,000 acre-feet of water to the upper South Platte Valley and thereby create a potential for improving the feasibility of that reclamation project provided that the Bureau is able to negotiate appropriate agreements with Colorado water users on the western and the eastern slopes.

This is a complicated situation, gentlemen, and members of the committee. It has been in two courts and is pending there now. The question is, does the United States, after investing \$160 million in the whole project and over \$9 million in this power project, from which it is deriving an income of \$500,000 a year, net, does it have the prior right to use the waters of the Blue or does the city of Denver.

These hearings on the Colorado Big Thompson project were had before the congressional committees in 1938, and Denver at that time never appeared and said, I challenge them to produce one single sentence in which they said, "We have a prior claim on the waters of the Blue."

They remained silent. Now they come into court and try to establish that the investment of \$160 million made by the Federal Government is not a firm investment because Denver has the prior right to use that water. It has been said here that the Hill report shows that this water is available. I call your attention to page 51 of the Hill report, where, in accordance with what I think are proper ethics he said he couldn't comment upon the supplies of the Blue River because it was in litigation and it was improper for him to do.

Again we say that in this novel proposal they ask this committee to set itself up or set up legislation which would permit eminent domain proceedings against the United States. They ask this committee to establish a precedent by which a city is furnished with water far in excess of its needs, 70,000 acre-feet would support a million population there. They have enough for 770,000. How do they justify asking for enough water to support another 700,000?

Those are some of the questions that arise in connection with this. We think that the demand is unfair and unjust. We thank you for giving us the attention of presenting our cause. It is from the national standpoint, we say, and not from the sectional standpoint.

Thank you.

Señator WATKINS. The prepared statement you have will be inserted into the record.

(Mr. Delaney's statement follows:)

STATEMENT OF FRANK DELANEY, ATTORNEY FOR THE COLORADO RIVER
WATER CONSERVATION DISTRICT

This statement is presented in behalf of the Colorado River Water Conservation District, a public corporation created by act of the Legislature of the State of Colorado and empowered, inter alia, to—

initiate appropriations for the use and benefit of the ultimate appropriators and to do and perform all acts and things necessary or advisable to secure and insure an adequate supply of water, present and future, for irrigation, mining, manufacturing, and domestic purposes within said district.¹

The district comprises seven counties and part of an eighth county in western Colorado. It embraces all of the area drained by the main stem of the Colorado River in Colorado, except Grand County. This is an area of 10,180 square miles, including the area in Grand County, which is within the Middle Park Water Conservancy District. Said district concurs in this statement. The combined population of these districts is between 90,000 and 100,000 people.

In this statement the organization I represent will be referred to as the "district."

The district approves the Senate bill as originally introduced. It opposes the amendments which would further, or aid in any way, the exportation of water from the Colorado River Basin to the area about Denver in eastern Colorado. That there is no surplus water for trans-mountain diversion is the basis for our opposition to such diversions.

We favor storage on the Colorado River wherever storage sites may be found to control and equalize the erratic fluctuation in streamflow. We prefer storage as high on the streams as possible, but if sites are not available, storage lower down may serve the same purpose by use of the system of exchange of downstream-stored water for the direct flow on the upper reaches of the stream.

The district for which I speak does object to the inclusion in this bill of any amendments or proposals for or in aid of the diversion of Colorado River water from the Pacific slope of the Rocky Mountains to the Atlantic slope. The reasons for that opposition appear in the statement made in behalf of this district at pages 620 to 628 of the hearings before the Subcommittee on Irrigation and Reclamation of

¹ See ch. 220, Colorado Session Laws of 1937, p. 997, and particularly sec. 5c, pp. 1000-1001.

the Committee on Interior and Insular Affairs of the House of Representatives, 83d Congress, 2d session, on the same bill. The reasons for our opposition to any amendment which will aid exportation of water through the Continental Divide are explained in that statement. We ask that said statement be considered.

To summarize the contents of said statement, we say that any acknowledgment by Congress of any claim by others to export water from the Blue River in Colorado will undermine the investment of the United States in the Colorado-Big Thompson reclamation project in which the United States has already invested \$160 million; it will be a repudiation of Senate Document 80 and a violation of the protective provisions designed to safeguard the rights of the water users of western Colorado in the use and operation of the Green Mountain Reservoir.

Any such action will affect, directly or indirectly, the litigation now pending in Federal court in which the question whether the United States has the superior right to the use of the waters of the Blue River in and through the Green Mountain Reservoir, or whether Denver has the superior right to the same waters, is raised. Such effect must necessarily be adverse to the interests of those whose rights were to be protected under Senate Document 80.

Denver does not need the water of the Blue River. We base this assertion upon the testimony of J. R. Riter, chief planning engineer of the Bureau of Reclamation, formerly chief hydrologist of said Bureau. The city has water rights from the South Platte River and its tributaries and from certain tributaries of the Colorado River for a firm, dependable supply of 183,500 acre-feet per annum, evidenced by absolute and conditional decrees. The decrees are conditional only because the works for diversion have not been completed and, therefore, the water has not been used. This is enough water, according to Denver's own record of use, a use which is conceded to be largely unmetered and extravagant, to serve a population of 770,000. This is approximately 200,000 more persons than the population of Denver and its metropolitan area according to the last United States census and reliable estimates of subsequent growth. Now the city wants another 177,000 acre-feet of water. This would supply an additional population of approximately 700,000.

In the present year of 1954, water is short everywhere in Colorado and this condition undoubtedly applies to Denver.

The answer to Denver's problem is more storage reservoirs to utilize high runoff of the streams in western Colorado from which the city already has appropriations. It does not matter how many direct-flow rights the city has, evidenced by decrees, from the streams if there is no water in those streams at the time water is needed. Let me illustrate by giving you some figures on the Green Mountain Reservoir, the replacement slope feature of the Colorado-Big Thompson project; Senate Document 80, page 3, paragraph 5-A, provides:

The Green Mountain Reservoir, on similar facilities, shall be constructed and maintained on the Colorado River above the present site of the diversion dam of the Shoshone powerplant, above Glenwood Springs, Colo., with a capacity of 152,000 acre-feet of water with a reasonable expectancy that it will fill annually.

On April 22, 1954, when the amount of water stored in said reservoir was at the lowest for the year 1954, 43,767 acre-feet of water was in the reservoir. This included 7,757 feet of dead storage. On June 22,

1954, the total storage had been increased to 97,000 acre-feet only. The flood period in the river was then at an end. Hence, the maximum amount of water which could be stored during the runoff period of 1954 was a little over 54,000 acre-feet of water. There was and will be no water available for exportation from the Blue River in 1954.

We further assert that all of the water of the Colorado River to which Colorado is entitled can and will be used in western Colorado. The cost of such utilization will be less and the purposes for which it is used will afford a greater measure of security and benefit to the Nation as a whole than any use which might result by exportation of the water from the basin. In support of this assertion, we refer you to the potentials shown in the statement of Judge Dan H. Hughes appearing at page 347 of the printed hearings before the House committee and the statement of C. H. Jex, engineer, submitted before this committee.

When Senator Edwin C. Johnson was Governor of Colorado a State policy was adopted whereby uses of water for agricultural and industrial purposes within the basin were given preference. That policy is embodied in Senate Document 80 and in the works constructed pursuant thereto. Before controversies arose the policy was acclaimed as fair and just. If the policy was right then, it is right now.

The inclusion of one city in such a program may establish a precedent under which all other cities may ask Congress to finance additions to municipal water supplies as a part of any and every type of flood control and stream improvement measures.

Senator WATKINS. Mr. C. H. Jex.

I think you might state your official position and where you reside.

STATEMENT OF CLIFFORD H. JEX, ENGINEER, WESTERN COLORADO WATER ASSOCIATION, GRAND JUNCTION, COLO.

Mr. JEX. Clifford H. Jex. I live at Grand Junction, Colo., and I am engineer for the Western Colorado Water Association.

Senator Watkins and Senator Barrett, it is a very real pleasure to appear before you at this hearing. If permitted, I would like very much to file with the committee a prepared statement, and merely call to the attention of the committee a few basic facts.

I represent western Colorado. In that area, 11 million acre-feet of this great resource that you men are considering here originates. That is 70 percent of the entire resource that is under consideration.

Studies show that at the present time there is only left 1 million acre-feet to be used in the State of Colorado. There have been placed to use or committed approximately 2 million acre-feet. Coming right down to our serious problem, eastern Colorado in one single request is asking for a diversion of 447,000 acre-feet or one-half of the water left for the use in the State of Colorado.

In other words, the area I represent is the area which contributes 70 percent of the water supply, this is 11 million acre-feet. Of this we have only 1 million acre-feet left, and now we are confronted with the problem of dividing that in half, with one single project to eastern Colorado.

Senator WATKINS. Just a question there. Do I understand you to say there is over 400,000 acre-feet that the city of Denver wants?

Mr. JEX. That is right, Senator. Let me explain it this way: The city made a presentation yesterday asking for 177,000 acre-feet of diversion to the city of Denver. In the House committee, in January, they said this would be followed by an additional diversion of 270,000 acre-feet, making 447,000 acre-feet.

Eight of the major oil companies of the United States met at Glenwood Springs in September of last year. By the way, let me read the names of these oil companies:

Cities Service Oil Co., Continental Oil Co., Eaton Shale Co., Pacific Western Oil Corp., Shell Oil Co., Sinclair Oil & Gas Co., Standard Oil Co. of California, and Union Oil Co. of California.

These 8 companies filed a report requesting that the State set up a reserve of water for the use of the oil shale industry. The men speaking at the meeting said that it was mandatory that that be done, because this country could not afford to take the chance of handicapping its oil supply, and it was mandatory that this oil shale be protected.

Senator WATKINS. How much water would it take to protect the oil supply?

Mr. JEX. In their report a presentation of a requirement of from three to four hundred thousand acre-feet of water was made.

Senator WATKINS. Will that water be used consumptively in the oil shale processing and production plants?

Mr. JEX. That is right. It is a consumptive-use figure.

Now, then, the Bureau of Reclamation in their studies of western Colorado have now issued reports on projects that will consumptively use 955,000 acre-feet of water. Let's add those 3 uses together.

Nine hundred and fifty-five thousand acre-feet for irrigation use in western Colorado, 447,000 acre-feet for this one single request to eastern Colorado, and 300,000 acre-feet to the oil shale interests, and we have 1,722,000 acre-feet of water, and we only have 1 million acre-feet to supply it. That allows nothing for other industries in western Colorado.

That allows nothing for projects the studies on which we know are underway for additional exportation to eastern Colorado.

We feel this way in all honesty, that the city and county of Denver must have some water. There is no question about that. We feel that it would only be to the national interest, it would only be to the interest of everyone, if that water supply was cut down to a figure that is reasonable.

Senator WATKINS. What would you say would be the reasonable figure?

Mr. JEX. Senator, in meetings with the city and county of Denver which I had a chance to sit in on, we of western Colorado presented a plan to the city and county, which said that western Colorado would sacrifice 250,000 acre-feet of water for all future transmountain diversions in the State of Colorado.

We also said that we felt at this time the city and county of Denver should be curtailed or should agree to a quantity of 75,000 acre-feet, which would suffice for a population in excess of 1 million people, or according to their own figures, would supply the city and county of Denver to a time beyond the year 2000.

We further said in that agreement, Senator, that in 30 years from now we will review the water subject.

If the people of Denver need additional water, they could have some of the water. On the other hand, if we grow and we have to have it for our oil shale and our irrigation, the water would be all gone, Denver should take its chances with us. We are willing to meet Denver on the proposition of a 30-year plan.

But to come in now and demand the water, demand half of it, we couldn't go on that plan, Senator. That was the sum and substance of the negotiations with the city and county of Denver.

Senator WATKINS. I am trying to reconcile your statements with the testimony given by the Denver representatives yesterday about the amount of water they needed for the population. It seems to me they were talking about needing 150,000 acre-feet. You say it is more than that.

How do you figure out or on what basis did you decide that 75,000 acre-feet is enough for a million people?

Mr. JEX. Senator, we take the figures of the city and county of Denver from the Breckenridge case, in which, if I am informed correctly, they said that their water resources now, when fully developed, would satisfy a population of 777,000 people. They further said that it was 0.236 acre-feet per person per year.

If you divide 0.236 into 75,000 acre-feet, you come up with about 420,000 people, and you add that to 777,000, and you get about, in round figures, 1,200,000 people.

Senator WATKINS. But you have to use the water they now have and add to that the 75?

Mr. JEX. That is right, you add to it the 75,000. That is far different from the 447,000 acre-feet.

Senator WATKINS. I was thinking of the testimony given by Mr. Tudor, at the House hearings and here, that 120,000 acre-feet of water would take care of a city the size of Denver.

Mr. JEX. I believe that is about the present use. The present population, I presume, is somewhere around 650,000 people.

Senator WATKINS. Mr. Tudor made a fairly accurate statement, then, did he not?

Mr. JEX. Yes.

Now I would like to comment briefly on the subject of Green Mountain Reservoir. That came into the committee's discussion yesterday. This Green Mountain Reservoir was built as a part of the Colorado-Big Thompson project. It was built for replacement purposes and to irrigate land in western Colorado. As a result of that construction in the last 15 years there have been placed under irrigation 30,000 acres of land.

In part, this 30,000 acres of land is dependent on Green Mountain Reservoir. If it was not for the water in Green Mountain Reservoir, the water supply on that 30,000 acres would be shut off in practically every year. So I would say this, that Senate Document 80 is fulfilling the intent of the people that drafted the document. If you give us another 10, 12, 14 years, we will have another 30,000 acres under that reservoir.

That reservoir is an essential part of our water supply in western Colorado. I petition this committee not to take that reservoir away from us as requested by the city and county of Denver.

Senator WATKINS. The way I understood it, all they wanted was the power water there. How does that work out? I am not too clear on that from the statements made yesterday.

Mr. JEX. Senator Watkins, the Green Mountain Reservoir as set up in Senate Document 80, says that 50,000 acre-feet of capacity would be used as replacement for present rights on the Colorado River.

Senator WATKINS. 50,000, did you say?

Mr. JEX. 50,000 acre-feet. The other 100,000 acre-feet of capacity would be used for power and irrigation purposes in western Colorado, particularly expansion of the irrigation in western Colorado.

Incidentally, Senator, Senate Document 80 mentioned the use of reservoir water on oil shale. It is true, as of today the full capacity of the reservoir is not being used for irrigation, and of course when it isn't used for irrigation it is used for power, but it was anticipated by those people drafting Senate Document 80 that in the future it would all be used for irrigation. At the present time we have developed 30,000 acres under it. If given a few more years we will develop additional land. That is 2,000 acres a year, Senator, and it has all been developed by private initiative, by the farmer himself, going out and extending his ditch, bringing in new land.

Senator, if I may refer to one matter, and this is some of the background in the State of Utah, but I do it for matters of comparison, western Colorado is a relatively young area. The Indians left the area of western Colorado about 1880. That makes western Colorado about 40 years younger than the first settlement of the State of Utah. I presume it is from 40 to 60 years younger than the settlement of eastern Colorado.

The problem we are faced with is this: Say 40 years ago somebody came on to the Provo River, and wanted to drill a tunnel from the Provo back to the Duchesne River, and said, "We believe we will need some of this water in the future for our population." That would have prohibited the development that has taken place on the Provo, it would have prohibited several canals to expand, it would have prohibited all those reservoirs that have been constructed on the Provo River.

We are in that same position in western Colorado. If the quantity of 447,000 acre-feet of water as asked for by the city and county of Denver is permitted to be diverted, it will curtail and handicap and make impossible the use of this water in western Colorado.

In all fairness, on this case we have analyzed the Bureau of Reclamation reports as they apply to eastern Colorado and western Colorado, and we find this to be the situation: To use this water in eastern Colorado it requires a cost by the Federal Government of putting this water resource and land resource together, of \$1,500-plus per acre on the South Platte River, it costs \$1,700-plus on the Arkansas River, and the Bureau of Reclamation reports in western Colorado show it can be placed together, those two resources, at a cost of from \$300 to \$800 or \$900 an acre.

It would seem to me that we have a resource here that is not available for use, both outside and inside the basin and it would certainly be a waste of money to transport the water out when the costs are 2 to 3 times as high as it would be to permit its use within the basin. I think that is about all I care to say, Senator.

Senator WATKINS. Do you think it is a proper function for this committee to decide the controversy between the east and west slope?

Mr. JEX. No, sir; I sure don't, Senator. I do not think that is at all proper. We are all sorry of this problem in Colorado. I will relate to you one comment of people during the meetings in Denver during which we attempted to settle this matter.

They said to us that "We have the votes in eastern Colorado, and the Congress has the money, so we are going to take your water away."

This hearing is our last resort in request of help.

Senator WATKINS. Thank you, Mr. Jex. Your statement will be made a part of the record at this point.

(Mr. Jex' statement follows:)

STATEMENT BY CLIFFORD H. JEX

My name is Clifford H. Jex. I am engineer for the Western Colorado Water Association representing water interests of western Colorado in the drainage basin of the Colorado River.

Water is the key natural resource of the entire Colorado River Basin. With water the basin can develop; without water the development ends. We of western Colorado are firmly convinced that the ultimate development of our area is dependent on the soundness of the management of the future use of this great resource.

For the greatest and most economical use of the water of this basin, water must be stored near its source of supply in the numerous mountain valleys of the basin. This storage must be in such quantities that it will be available for use throughout the area for irrigation and other purposes. This type of development will permit a use and reuse of the same water.

The Curancanti Reservoir will accomplish this purpose. This reservoir will provide water for irrigation use, for municipal and industrial use and for the generation of power. The reservoir will also provide a means of flood control for the lower Gunnison River Valley and the area in the vicinity of Grand Junction, Colo. Western Colorado is very much in favor of the construction of the projects as outlined by Senator Johnson in his statement to this committee.

Western Colorado is also mindful of the fact that in order to increase the consumptive use of water in the upper Colorado River Basin, holdover reservoir storage for release downstream will be necessary to satisfy other users of Colorado River water. This is a double obligation to us in the upper basin.

The water supply of the Colorado River for use within the State of Colorado is critically short. The time of full utilization of this important resource is now in sight and each new demand must be critically analyzed in terms of its importance to the State and also the Nation.

We of western Colorado are faced with the very difficult problem. Although an average of about 11 million acre-feet a year or over 70 percent of the yield of the Colorado River at Lee Ferry originates on the western slope of the Continental Divide in Colorado, it is now evident that as a result of international treaties and interstate compacts, the State of Colorado will never be permitted the use of more than an average of 2,800,000 acre-feet annually.¹ Of this amount, there is now in use or committed in round figures 1,800,000 acre-feet, leaving a balance for future use of only 1 million acre-feet.²

¹ Conclusions contained in Leeds, Hill & Jewett Report, p. 12, less an estimated allowance for Colorado portion of the Mexican Treaty obligation.

² See water supply analysis attached.

The Denver-sponsored Blue River diversion, if built, will in effect place a new use commitment on the Colorado supply of an additional 447,000 acre-feet.³ This is approximately one-half the remaining water available for use by the State. This diversion of water, promoted by the city and county of Denver under the guise of municipal use, is in reality 85 percent for direct irrigation use in the South Platte River Valley of eastern Colorado.

Testimony of Denver officials in present pending litigation shows that the city now holds command of sufficient water, if adequately developed, for a population of 777,000 people. In light of this present supply, an additional amount of 75,000 acre-feet would adequately provide for a total population for the Denver system of at least 1 million people. A population of 1 million is not likely to be reached by Denver prior to the year 2000.

Western Colorado is relatively young. Settlement of the basin started about 1880. In the short period of years from 1880 to the present time, two-thirds of the available water supply is now in use or committed. In the last 15-year period the irrigation in the natural basin has expanded 19 percent. This expansion was accomplished by individual farmers and ranchers of the basin. This type of expansion is very desirable and will no doubt continue as long as the supply of water remains available in the natural basin.

Studies of new potential irrigation projects have been conducted by the Bureau of Reclamation on both sides of the Continental Divide for use of Colorado River water in Colorado. The results of these studies as now reported show that the water supply will be the limit of development and that only a part of the projects as now studied can ever be constructed.

The figures as developed on the cost of water use on the two slopes of the Continental Divide in Colorado show that the present-day total irrigation subsidy requirement for the use of Colorado River water in the South Platte River Basin of eastern Colorado is \$1,520, and in the Arkansas River Basin, also in eastern Colorado, it is \$1,730 per acre for new land irrigated or new land equivalent. This subsidy cost is 2 to 3 times the subsidy cost of placing the same water to use in the natural basin of the Colorado River. In light of these studies, it would appear not only unwise but a direct waste of Federal money to approve projects for the diversion of water for irrigation use out of the natural basin with costs 2 to 3 times that required for the use of the same water within the basin.

The upper Colorado River Basin is now nationally recognized as the source of the Nation's future supply of synthetic liquid fuels and as the principal source of domestic uranium. Both of these minerals are of vital importance to the future security of this Nation. In the semidesert climate of the Colorado River Basin the development of these resources cannot be accomplished without water, and the unused supply is diminishing each year as new additional water uses develop. Hasty action on the diversion plan of the city and county of Denver would tie up for all time at least one-half of the available water supply of the future and place in jeopardy the Nation's future supply of both liquid fuel from shale and uranium.

At a meeting on September 24, 1953, held in Glenwood Springs of western Colorado, eight of the major oil companies of the Nation pre-

³ The official statement of the city and county of Denver on file with the House Interior and Insular Affairs Committee, par. 5.7.

sented a joint report on the probable requirements for oil production from shale in the Colorado River Basin. The companies estimated that production would be started by the year 1960, and by the year 1975 an annual production of 2 million barrels of oil per day could be expected. The one assumption underlying the estimates of the oil production was that water for its development would be retained in the area of the oil-shale deposits.

We are unable to present information at this time on the uranium industry of western Colorado, as the same is restricted for reasons of national security. We can, however, say that the mining and milling of uranium deposits is rapidly expanding day by day, requiring additional quantities of water.

Analysis of Colorado River water supply for use in Colorado

	<i>Acres-feet</i>
1. Total supply for consumptive use in Colorado: Total supply as given on p. 10 of Hill Report.....	3, 100, 000
2. Present in-basin consumptive use:	
(a) Irrigation depletions as given in Hill Report, p. 16.....	1, 035, 000
(b) Other depletions as given in Hill Report, p. 17.....	37, 000
(c) Additional irrigation depletions not included in Hill Report..	116, 000
Subtotal.....	1, 188, 000
Balance.....	1, 912, 000
3. Present transmountain diversion use: Depletions by operating projects as given on p. 17. Hill Report.....	377, 000
Subtotal.....	377, 000
Total.....	1, 535, 000
4. Committed uses:	
(a) Expansion of existing transmountain diversion projects as given on p. 18 of Hill Report.....	100, 000
(b) Expansion of existing in-basin projects and use by authorized projects as given on p. 18 of Hill Report.....	97, 000
(c) Depletion by the Frypan-Arkansas project as given on p. 54 of Hill Report.....	72, 000
(d) Treaty with the Republic of Mexico.....	259, 000
Subtotal.....	528, 000
Balance.....	1, 007, 000
5. Industrial in-basin use:	
(a) Estimate for oil shale and associated industrial use.....	300, 000
(b) Estimate for other in-basin industrial use.....	100, 000
Subtotal.....	400, 000
Balance.....	607, 000
6. Demands of Denver diversion project: Depletion of Denver diversion project as presented in official Denver statement in Washington on Jan. 24, 1954.....	447, 000
Subtotal.....	447, 000
Balance.....	160, 000

On the basis of the above analysis the 160,000 acre-feet would be the limit of the future western Colorado agricultural development. This

is about equal to the agricultural expansion that has taken place during the past 15 years.

Senator WATKINS. Mr. Earl Bower, of Wyoming.

**STATEMENT OF EARL T. BOWER, VICE PRESIDENT AND DIRECTOR,
NATIONAL RECLAMATION ASSOCIATION, WORLAND, WYO.**

Senator BARRETT. Mr. Chairman, I might state that Mr. Bower is an oldtime resident of our State. He is presently and has been for a long time a member of our State senate. He is one of the directors of the National Reclamation Association, and is vice president at the present time of that association. He has had wide experience in reclamation work.

Senator WATKINS. We are glad to have you with us.

Mr. BOWER. Senator Watkins and members of the committee, I will omit the first part of my statement here, because Senator Barrett has kindly identified me.

I am presenting this statement as a representative of the Wyoming Natural Resource Board and the State of Wyoming. I will not try to cover any of the engineering and technical phases of these projects. I wish to say, however, that I concur with the other representatives of our State and approved the proposal that is now before you in S. 1555 for authorization of the Colorado River storage project and participating projects.

The people of my State have been looking forward for many years to the time when the waters of the Green River and the Colorado River could and would be put to beneficial use. In 1940 the Governor of our State, at the request of interested parties in the Green River Basin, started a movement to secure a compact between the upper Colorado Basin States of New Mexico, Colorado, Utah, and Wyoming. Compact commissioners for the States and a representative for the Federal Government were finally appointed in 1946. After many weeks of negotiation over a period of 2 years, a compact was agreed to and signed during October 1948. During the next session of the legislatures of States of the upper basin, the compact was ratified by the affected States and the United States Congress. This was a very necessary procedure for our State, because the area in our State is at the headwaters of the Green River, which is a principal tributary of the Colorado River. Without a compact agreement setting out Wyoming's equitable portion of the water, development could proceed in some lower States before we could make beneficial use of the water which rightfully belongs to the State of Wyoming.

The upper Colorado River compact as passed provides for, and caused to be set up, the Upper Colorado River Commission. The Bureau of Reclamation, working with the Upper Colorado River Commission, is responsible for the comprehensive plan known as the Colorado River storage project, which is being considered by your committee. I need not go into the details of the plans for this project, as they have been covered very thoroughly by the proponents in the upper basin States. The people of Wyoming are 100 percent for this development.

The 1953 session of the Wyoming Legislature unanimously passed a memorial endorsing the Colorado River storage project. This memorial was presented at the House hearing and appears on page 289.

The economy of the Green River watershed of Wyoming is largely dependent upon the cattle and sheep industry. Many times in the past, as is the case at the present time, drought has struck this basin and thousands of head of cattle and sheep have been and are being forced on a depressed market. Many livestock growers have had and are having to sacrifice their herds because of the shortage of range and the loss of feed for the coming winter. If your committee sees fit to recommend the Colorado River storage project and the participating irrigation projects, the agricultural economy of this region will be greatly benefited and stabilized as will like areas in the other upper basin States. The water storage and electric energy which will be made available as a result of the building of this project will make possible the development of the mineral resources which are abundant in all of the States of the Colorado Basin.

At the present time, due to the lack of demand for coal, a very serious unemployment and business slump exists in many of the towns and cities of the area. I certainly want to concur with a statement made by the Honorable Arthur V. Watkins, Senator from Utah, in the Senate of the United States, Wednesday, March 31, 1954, entitled "Echo Park Dam Foes Ignore Fact That Upper Colorado River Basin Already Contains a Public Recreation Area Larger Than New England."

Mr. Chairman, members of the committee, I would like to request that this speech by Senator Watkins be inserted in the record at this time.

Senator WATKINS. Certainly I cannot object to it.

Senator BARRETT. No objection.

Senator WATKINS. It will be inserted into the record at this point. (The data referred to follows:)

ECHO PARK DAM FOES IGNORE FACT THAT UPPER COLORADO RIVER BASIN ALREADY CONTAINS A PUBLIC RECREATION AREA LARGER THAN NEW ENGLAND—SPEECH OF HON. ARTHUR V. WATKINS OF UTAH IN THE SENATE OF THE UNITED STATES, WEDNESDAY, MARCH 31, 1954

Mr. WATKINS. Mr. President, there has been so much misinformation on public recreation needs in the West, apparently generated by so-called conservationists in the vicious propaganda campaign against Echo Park Dam, that I would like to take this opportunity to make some facts clear for the Members of this body.

In the four States comprising the upper Colorado River Basin—Utah, Wyoming, Colorado, New Mexico—there is already available for public recreational use an immense area of 43,143,649 acres. This acreage includes national parks, national monuments, national forests, wildlife reserves, and recreational areas. The acreage figures, obtained from the latest available report of the Director of the Bureau of Land Management, are as follows:

National forest area

	<i>Acre</i>
New Mexico.....	9, 009, 613
Colorado.....	13, 709, 195
Wyoming.....	8, 566, 691
Utah.....	7, 875, 525
Total.....	39, 161, 024

Other recreational withdrawals

The areas withdrawn for national parks, monuments, wildlife reserves, and recreational areas, in addition to the areas reserved for forests, are as follows:

	<i>Acres</i>
Colorado.....	578, 489
New Mexico.....	454, 953
Utah.....	389, 304
Wyoming.....	2, 560, 879

The total area, in addition to the national forests, which are largely used for recreational purposes, as well as for timbering and other purposes, is 3,983,625 acres.

To give an idea of the vast size of this four-State public recreation acreage, I would like to point out that it is an area larger than the State of Illinois—36,096,000 acres—and slightly larger than the total acreage—42,629,120 acres—of the 6 New England States: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island. Those States have a total of 42,629,120 acres.

In this tremendous public recreational domain, people from everywhere in the Nation can come to enjoy a variety of recreational pursuits. Residents of those four upper basin States use those recreation areas heavily, and we spend thousands of dollars in advertising, trying to lure other residents of the Nation to come and enjoy them with us.

VAST "PRIMITIVE" AREA

Included in this vast recreational acreage is a total of 4,267,168 acres—nearly as large as Connecticut and Delaware combined—set aside as "primitive areas." These magnificent areas are classified and managed so as to preserve primitive conditions that prevailed when our pioneering forebears arrived on the scene.

I think these figures are indicative that the residents of these four States are well aware of the need for public recreation areas and that they have backed efforts of the Federal Government to set aside and preserve such areas.

In contrast, the combined contribution of the 14 eastern seaboard States to Federal recreational areas is worth noting. Similar dedicated Federal acreage in the 14 seaboard States totals only 4,502,747 acres, or roughly one-tenth the area so reserved in the 4 upper basin States.

We are not complaining at this disparity. We recognize that the national forest and national park movements originated after these States were well populated. Furthermore, the policy of preserving large areas of public domain as Federal property had not materialized when these Eastern States came into the Union.

This latter policy has succeeded so well, incidentally, that the four upper basin States are now virtually "crown colonies" of the Federal Government. Percentages of land area under Federal ownership or control in those States are as follows:

	<i>Area federally owned</i>	<i>Percent</i>
Utah.....		72
Wyoming.....		52
New Mexico.....		45
Colorado.....		38

In other words, even though these States are faced with supporting State and local governments on tax revenues from only 28 percent to 62 percent of their total acreage, they are making available within their borders a recreational wonderland the size of New England for all the people of the Nation to enjoy.

As I stated, we are not complaining about this contribution. We are thoroughly sold on it. In fact, we rather glory in being in the center of a recreational paradise of that variety and magnitude.

But what we do complain about is the action of some so-called conservationists, who close their eyes to that recreational contribution and seek to block a water conservation program vital to the continued economic and population growth of this semiarid, four-State area.

When the true facts are known about the millions of acres already reserved in the four upper basin States for public recreational purposes, few reasonable people will deny the upper basin States enough ground, even in a national monument, to build a reservoir to conserve waters which are so desperately needed. It should be remembered that water is literally the lifeblood of these States, and without its conservation thousands of the youth of those States will be denied the opportunity to make their homes in the land of their ancestors.

MONUMENT "INVADES" DAM SITE

The real truth is that there is no invasion of national monuments by this reclamation project. The true situation is the other way around. National monuments have invaded what Nature had really developed as a fine reservoir site, and which had been long in contemplation by the people of the upper basin States as a storage reservoir. And the people of that area were led to believe that if they did not object to the extension of a national monument—which at that time consisted of approximately 80 acres, where some dinosaur bones were found—that there would be no objection whatever to the building of a reclamation project in the same area.

I ask unanimous consent to have printed in the Record at this point as a part of my remarks an affidavit made by Mr. David H. Madsen, former superintendent of the Dinosaur National Monument; also a statement by Dr. J. Leroy Kay, curator of vertebrate paleontology, Carnegie Museum, Pittsburgh, Pa.

There being no objection, the affidavit and statement were ordered to be printed in the Record, as follows:

AFFIDAVIT

"STATE OF UTAH,
"County of Utah, ss:

"David H. Madsen, being first duly sworn on oath, deposes and says: That he is over the age of 21 years and a citizen of the United States, and a resident of Utah County, Utah. That at the time the area of the Dinosaur National Monument was expanded to include the canyon unit I was employed by the National Park Service under the title of "Supervisor of Wildlife Resources for the National Parks." Among my other duties I was Acting Superintendent of the Dinosaur National Monument, and in that capacity was ordered by the National Park Service to arrange for hearings at Vernal, Utah, and Craig, Colo., for the purpose of securing the approval of the citizens of that area for the expansion of the Dinosaur National Monument to include the canyon unit. Meetings were accordingly held at Vernal, Utah, June 11, 1936, and Craig, Colo., June 13, 1936. A large representation of the citizens of the area were present at these two meetings.

"Among other questions which arose was the question of grazing and the question of power and/or irrigation development which might be deemed essential to the proper development of the area at some future time. I was authorized to state and did state, as a representative of the National Park Service, that grazing on the area would not be discontinued and that in the event it became necessary to construct a project or projects for power and irrigation in order to develop that part of the States of Utah and Colorado, that the establishment of the monument would not interfere with such development.

"The first part of this agreement with reference to grazing has been carried out, and the residents of the area involved are entitled to the same consideration with reference to the development of power and irrigation at the Echo Park and Split Mountain Dam sites, and any other development that may not unduly interfere for the purpose of the establishment of the monument and which is necessary for the proper development of the area.

"DAVID H. MADSEN.

"Subscribed and sworn to before me this 27th day of March A. D. 1950.

KARL H. BENNETT,

"Notary Public, Residing at American Fork, Utah.

"My commission expires December 25, 1950."

"STATEMENT OF J. LeROY KAY, CURATOR OF VERTEBRATE PALEONTOLOGY, CARNEGIE MUSEUM, PITTSBURGH, PA.

"I am J. LeRoy Kay, curator of vertebrate paleontology at the Carnegie Museum, Pittsburgh, Pa. I spent 8 years excavating dinosaurs at the Dinosaur National Monument—1915 to 1923—and several summers since that time in the area.

"There has been considerable controversy in regard to the benefits and damage to the Dinosaur National Monument by the construction of Echo Park and Split Mountain Dams. I have read with much interest the pros and cons of this controversy as I have a deep personal interest in the matter, having spent many years in the area as a paleontologist for the Carnegie Museum of Pittsburgh, Pa. During this time, I visited by boat, horseback, and on foot, most all of the present accessible places in the study of the natural history in which the area abounds. There are rock formations representing several hundred million years of the earth's history within the confines of Dinosaur National Monument.

"In the early days of the controversy the opponents of the dams maintained that the backed-up water would cover the dinosaur beds, for which the monument was primarily established. This argument is no longer used as it is well known that the waters will not cover the dinosaur beds. However, the impounded waters would allow visits to the more or less inaccessible places by boat. There are many such places where one could visit and study the canyon walls and rocks with embedded fossils, which are not accessible at present. The cost of building hanging walks or tunnels with viewing windows along the canyon walls would be prohibitive. It is true that trails, or even roads, could be constructed to the canyon rims where people could view the canyons at a distance but few would ever see many miles of the canyon walls close up where they could study the geological structures and fauna and flora both living and extinct.

"There have been a few people that have gone through the canyons of Lodore, Yampa, Whirlpool, and Split Mountain by boat and some have lost their lives in the attempt. Which is the better judgment—to preserve these canyons as they are for a few daredevils to have the thrill of shooting the rapids or thousands of people visiting these canyons by boat on still water? One only needs to compare the additional number of visitors that each year visit the areas of the Hoover Dam in Nevada, the Roosevelt Dam in Arizona, the Grand Coulee Dam in Washington, or the Fort Peck Dam in Montana, to mention a few, to see what the results will be at the Dinosaur National Monument if the Echo Park and Split Mountain Dams are built.

Since the National Park Service took over the Dinosaur National Monument a few thousand people have visited the monument headquarters at the dinosaur quarry each year and spent a few hours, or less, and a very few have visited other accessible places within the monument. A large percentage of those that visited the headquarters came away disappointed in what they saw for at the present there are few dinosaur bones exposed. This condition is at present being corrected as the Park Service is starting the relieving of the dinosaur bones in the Morrison stratum. This should increase the attendance at the monument considerably.

When the Carnegie Museum was excavating dinosaurs at the quarry there were nearly always many bones exposed, usually the greater part of one or more skeletons. Thousands of people visited there although we did not encourage visitors as it interfered with the work. We did, however, treat the visitors with courtesy and many spent a day or even as long as a week.

The waters back up by a dam at Echo Park would cover the lower part of the Lodore formation (see cross section submitted for the record). This formation is nonfossiliferous, at least, no fossils have been found although many workers have searched diligently for them. The formations above the Lodore are younger geologically and most of them contain invertebrate and plant fossils, some in abundance. I know of no way that these fossiliferous localities could be more easily reached than by boat on the waters impounded by Echo Park Dam.

I feel sure that the building of the Echo Park and Split Mountain Dams and the relieving of the dinosaur bones at the dinosaur quarry will make the Dinosaur National Monument one of the outstanding attractions of our national parks and monuments.

Mr. WATKINS. The people of the States involved are coming to believe that these so-called conservationist opponents to Echo Park Dam are more than a little selfish in their determination to block a worthwhile project that will result in saving water enough for a large-sized city, when at the same time the reclamation project will make available practically all of the ruggedness of the canyon and the wilderness scenery for literally millions of people who will then be able to visit it.

Incidentally, it may interest recreationists that an appropriation of \$21 million for recreational development of Dinosaur National Monument is authorized in the upper Colorado River storage project bill. For years now I have been fighting vainly for funds to build adequate access roads and modest facilities to permit tourists to enjoy this monument. The past administrations and Congress have refused to appropriate such funds and the monument is largely inaccessible and a disappointment to tourists who drive over the unimproved road leading to the shack which substitutes for an adequate monument headquarters. Without this reclamation development, Dinosaur Monument undoubtedly would continue to be a fringe unit of the national-park system—like several others in the upper basin States—underfinanced and without support or interest here in Washington, and elsewhere in the country for that matter.

OPPONENTS KNOW FACTS

The leaders of this outrageous propaganda campaign against Echo Park Dam know the facts. They have been spelled out time and again in congressional hearings.

They know that the dinosaur bones of the monument will not be affected by the construction of Echo Park Dam.

They know that the construction of Echo Park Dam and the proposed Split Mountain Dam will inundate less than 10 percent of the total monument area, and that much of this inundation will cover little more than the flood-washed portions of canyon floors. They should know that approximately 89 percent of the monument will remain free of water and in a wilderness state, and that the safe waterway provided by the Echo Park Reservoir will make the area available to thousands for every person who visits the rough, isolated area today.

They know also that the West has literally hundreds of miles of canyons equally as rugged and colorful as those in the Echo Park area.

They know these facts and they are well aware that the storage capacity of Echo Park Dam is essential to the success of the entire

project because of prior commitments downstream. They have heard experts testify that alternative sites proposed will lose by evaporation enough water for a city of a half-million people.

They know these facts and yet they deliberately seek to spread misinformation calculated to inflame and alarm honest recreationists and conservationists throughout the country.

I respectfully urge the Members of this body, and all honest conservationists everywhere, to get the true facts on the Echo Park Dam controversy. They can rest assured that the people who will pay for and benefit directly from the great upper Colorado River storage project are outstanding conservationists in their own right, and that the four upper basin States are making and will continue to make a most impressive contribution to national recreation.

Mr. BOWER. The facts are that if the monument is developed as proposed in this bill, it will be made more readily and safely accessible to the public than it is today.

I thank you.

I certainly concur with the statement that was made by Mr. Cory, when I refer to the fact that the monument will be more accessible to the public than it is today.

I also, Mr. Chairman, would like to ask to have inserted into the record a letter that I have here from Mr. William E. Welsh, secretary-manager of the National Recreation Association, addressed to the Honorable Eugene D. Millikin, chairman of the Irrigation Subcommittee, in which he outlines some of the policies of the National Reclamation Association in regard to water and power development.

Senator WATKINS. May I see the letter?

Mr. BOWER. Mr. Welsh wrote this letter to Senator Millikin, and I would like to request that it be made part of the record. It simply outlines the policy of the National Reclamation Association.

Senator WATKINS. It will be received for the record.

(The letter referred to follows:)

NATIONAL RECLAMATION ASSOCIATION,
Washington 4, D. C., June 30, 1954.

Hon. EUGENE D. MILLIKIN,
*Chairman, Subcommittee on Irrigation and Reclamation,
Senate Interior and Insular Affairs Committee,
Senate Office Building, Washington, D. C.*

DEAR SENATOR MILLIKIN: It has been suggested that the undersigned should set forth in a letter to you, for insertion in the record on the hearings for the upper Colorado River storage project, the background and objectives of the National Reclamation Association, emphasizing particularly its position with respect to multipurpose, basinwide reclamation projects and the use of power revenues to assist in the repayment of costs.

The National Reclamation Association was organized in 1932 upon the urgent insistence of western governors and leaders in reclamation, including the late Elwood Mead, then Commissioner of Reclamation, "to save reclamation for the West." Recognizing the benefits and the value of reclamation to the West and to the Nation, NIRA has consistently supported reclamation over the years. The call for the first meeting was issued by George H. Dern, then Governor of Utah and later Secretary of War.

The membership includes the active leaders in reclamation and water resource development from each of the 17 Western States which comprise approximately 60 percent of the area of the country.

The National Reclamation Association has long realized that the costs of reclamation projects properly allocable to irrigation are, in almost every instance, well beyond the ability of the water users to repay. With that in mind,

NRA has consistently urged, over a period of years, the use of power revenues to assist in the repayment of the costs allocable to irrigation.

We have likewise recognized that reclamation development in the great river basins of the West should be carried forward on a multipurpose, basinwide basis.

RESOLUTION—BASINWIDE DEVELOPMENT AND USE OF POWER REVENUE

The policy of NRA is that a resolution once adopted remains in full effect and force as NRA policy unless and until it has been modified, amended, nullified, or repealed by subsequent action. The following resolution on basinwide development and the use of power revenues was adopted by the membership in 1951 and still stands as the policy of the association.

RESOLUTION NO. 3—BASIN ACCOUNT

Whereas reclamation development on a basinwide basis is now generally recognized as the only means by which full utilization of river basin water resources can be utilized; and

Whereas in such basinwide development, revenues from all Federal power projects within the basin are being and must necessarily be made available as an aid to irrigation to repay the costs allocable to irrigation but which are beyond the ability of the water users to repay; and

Whereas there are numerous other basins throughout the West which are now being studied and reported upon by the Bureau of Reclamation, which said reports propose basinwide reclamation projects; and

Whereas in all river basins of the West where future reclamation development is contemplated, it will be necessary that any surplus revenues of the Federal development of the basin water resources be made available to assist in the repayment of the irrigation costs: Now, therefore, be it

Resolved by the National Reclamation Association, That it does hereby endorse and approve the general plan of basinwide water resource development and the use of revenues from all federal water development projects within the basin to the extent necessary to fulfill the repayment requirements of the reclamation projects within the basin: be it further

Resolved, That the subject of basin account legislation be further explored and studied; and that such study be undertaken in conjunction with further studies of basin development and national water and power policies; be it further

Resolved, That the National Reclamation Association recognizes the commendable efforts made by the basin account committee and their valuable services as evidenced by the report of said committee.

A NATIONAL WATER POLICY

In 1952 the NRA membership, at its annual meeting in Long Beach, Calif., approved in principle a national water policy; from which the following is quoted:

"2. All future projects should insofar as appropriate be proclaimed for basinwide development with all agencies participating in development to be brought about for every beneficial use.

"4. Local interests shall have a share in the revenues of power developed from multiple-purpose, interstate projects, this to take the form of contribution to the cost of construction when such cost exceeds the ability of the water users to repay after reasonable tests of feasibility have been made.

"5. The basin account should at the option of the basin be used as a bookkeeping method.

"8. * * * such installation (power) shall be placed upon a revenue-producing basis sufficient to retire capital cost and to aid in other development."

NATIONAL WATER POLICY STATEMENT

A national water policy statement was presented to the Task Force of the Hoover Commission at a hearing in Denver, Colo., May 17, 1954. This statement was approved by a 17-State water policy committee and the board of directors. Following are excerpts from this statement:

11. *Repayment of costs by irrigation water users.*—Agriculture, which is basic in the economy of any part of the country, is dependent on irrigation in the West for stabilization and advancement. The extent of making use of the land resource in that part of the Nation is likewise measured by the ability to bring the land and water resources together. And allied with such resource development

is the production of hydroelectric energy which is a potent factor in meeting the expanding industrial development and population growth; and these industrial and population trends are closely related to the utilization of other vital natural resources found in the western half of the United States. This all will result in an expanding national economy, increase in national wealth through the utilization of natural resources, increased tax returns, and, of great importance, new opportunities and homes.

The early day reclamation of land in the West was accomplished by private financing. In 1902 after the smaller and relatively inexpensive irrigation projects were built, it was found that private financing was incapable of meeting the needs for expanding irrigated agriculture in the Western States, and Federal reclamation of arid and semiarid lands was adopted as a national policy. The early reclamation projects were relatively small and devoted, except in a minor degree, solely to the irrigation of land. In comparatively recent years the great multiple-use projects have come into the picture. Such a trend was due to the necessity of building more extensively and expensively for the control of the remaining and available water supplies in order to meet the desirable objective of obtaining every use and benefit which the water resource affords. The situation has become more complicated by the greatly increased costs of construction which has been evidenced in recent years.

Out of the present-day situation in this respect, a problem is posed as to the manner and extent to which the irrigation farmer shall financially participate in the overall Federal reclamation program. His part in this national venture has become entwined in a great undertaking for the best and highest use of undeveloped water supplies for all purposes on a basinwide scope.

This paragraph is confined to a presentation of the association's views, so far as they have thus been formulated, with respect to this problem of the irrigation farmer's obligation for the repayment of Federal reclamation project costs. For the reasons pointed out above, it seems clear that the water resource of the West will be developed as fast as the national economy will permit and that potent forces in the West will continue to demand that their economic conditions be improved as expeditiously as possible through development of the water resource. The western water conservation and utilization program is on the march and cannot, it is believed, be denied. But it is also evident, that if Federal reclamation in the West is to proceed under the conditions herein mentioned, that there must be a liberalization of Federal laws respecting terms and conditions under which irrigation water users agree to pay their share of the investment in a Federal reclamation project. In this connection, these considerations are submitted by the association:

(a) The returns from the sale of hydroelectric energy generated by a reclamation project should aid in returning that part of the construction cost allocated to irrigation which is beyond the ability of the irrigation water users to repay.

12. *Power revenues should aid in repayment of irrigation costs.*—Since irrigation of arid lands is the major objective in the utilization of the limited and erratic water supplies of western rivers and because the cost of Federal reclamation projects in most cases cannot be fully paid by the irrigation water users, the returns from power revenues must aid in paying project costs allocated to irrigation. It is recognized that the extent of such aid should not result in a power rate which would prevent the marketing of the energy produced; and in this connection due consideration must be given to the principle of affording reasonably low power rates under a Federal project.

The foregoing represents the views, the philosophy, and the policy as approved of the National Reclamation Association on the general subject of basinwide development and the use of power revenues to assist in repayment of irrigation costs.

Respectfully submitted.

WILLIAM E. WELSH,
Secretary-Manager.

Mr. BOWER. I want to thank the committee for your courtesies and want to say that in the Green River Basin of Wyoming we have all of the things that were outlined by Mr. Cory in the basin of Colorado, and our future, as many other parts of this great basin depends upon this project for future development.

Senator WATKINS. Thank you very much.

Do you have any questions, Senator Barrett?

Senator BARRETT. Yes.

I would like to ask you, Mr. Bower, if it is true that the people of Wyoming are nearly unanimously in favor of the Echo Park Reservoir .

Mr. BOWER. I think I can state that I have heard no person in our State but what was unanimously in favor of this Echo Park Reservoir.

Senator BARRETT. Secondly, I would like to ask you this question, Senator Bower. Wyoming, of course, contributes a relatively small amount, compared at least with Colorado, to the water in the Colorado River. But after all, it is about 14 percent. If we do not have these storage projects up in Wyoming, then it will be impossible for us to reap any benefits whatsoever out of the waters that originate in Wyoming; is that not right?

Mr. BOWER. That is right.

Senator BARRETT. And consequently it would be eminently unfair, solely from the basis of the contributions which we make to the waters of the Colorado, unless the projects included in this legislation are authorized and constructed.

Mr. BOWER. That is right. We feel like, if I might enlarge on that a little, this area is one of the richest in our State in mineral resources, and the energy and water that will be made available by the conclusion of these lower reservoirs will be the thing that will make it possible for us to develop these rich mineral resources that you refer to.

Senator BARRETT. The next thing I want to bring out, and which I am sure you are fully aware of, is this: That at the present moment there are no projects being constructed in Wyoming. On the other hand, as intended in the original objective of the reclamation law, the Congress proposed that the income from the public lands of the Western States should be turned back and used to develop projects which would take the place of the exhaustible resources that provided the revenue to the Treasury of the United States. Isn't it a fact that at the present time the income from the public domain in Wyoming is approximately \$14 million a year, and that 52½ percent of that amount goes into the reclamation fund, which would be approximately \$8.5 million and in addition 10 percent, or \$1,400,000, goes into the Treasury of the United States. So all told, between the contributions to the reclamation fund and to the Treasury, about \$10 million a year is coming from the soil of our State.

Consequently, the objective, even, of the original act would not be fulfilled unless we find it possible to construct reclamation projects in our State so that we can have the benefit not only of the water that originates in our confines but also that we can have some new, irreplaceable and continuing resource that would offset the exhaustible resources, to wit, the oil taken from the soil of our State.

Mr. BOWER. I certainly concur in what Senator Barrett said, and I think Wyoming is being very modest when they make the request that we have made this year to get projects started in our State.

Senator BARRETT. I congratulate you on your fine statement, Senator Bower.

Senator WATKINS. Thank you.

The record should show that Senator Daniels, of Texas, a member of the committee, is also attending the hearings.

We have one other witness, I think, whose testimony will not take long to present, Mr. H. T. Person.

Mr. Person?

Senator BARRETT. Mr. Chairman, the next witness is an old friend of mine. He has been on the University of Wyoming faculty for nearly 30 years. He is presently the dean of the College of Engineering at the University of Wyoming, and a splendid one at that. He is an outstanding man in his field. He has contributed, in addition to his work at the university above and beyond his requirements as dean of the college, a tremendous amount of time and effort for the development of our State. We consider him one of our most valued citizens of Wyoming.

STATEMENT OF H. T. PERSON, DEAN OF ENGINEERING, UNIVERSITY OF WYOMING, LARAMIE, WYO.

Mr. PERSON. Thank you, Senator Barrett.

Mr. Chairman and members of the committee, since Senator Barrett has so kindly outlined my experience, I will skip the first statement. I am making this statement for the Wyoming resources Board and the State engineer's office of Wyoming.

The bill under consideration by the committee proposes the authorization for construction of 5 initial units of the so-called Colorado River storage project and 15 participating projects. Of the 5 storage units included in the bill, none are in Wyoming. Three of the proposed participating projects are in Wyoming.

The proposed storage units included in the bill are essential to make possible the maximum ultimate utilization of the water resources of the upper Colorado River Basin. The storage units are essential to permit the use by the upper basin States of the water allocated to them under the 1922 Colorado River compact. They are necessary to the upper basin States in connection with meeting the minimum flow obligations at Lee Ferry imposed by the 1922 Colorado River compact. The power revenues from the proposed storage units are essential in connection with the proposed irrigation development in the upper basin States, since the irrigation development needs aid from either power revenues or other sources.

The three participating projects in Wyoming are the LaBarge, Lyman, and Sneedskadee projects. These three projects will irrigate about 68,000 acres of new lands, and provide a supplemental water supply to about 40,000 acres of land which are already under irrigation. The total water depletion resulting from these three proposed projects will be about 125,000 acre-feet. With these three projects completed, Wyoming will be using only about 35 percent of the water allocated to it under the 1948 upper Colorado River Basin compact. To make further use of the water allocated to Wyoming will require the Kendall and other storage reservoirs in Wyoming.

The water users under the three proposed participating projects in Wyoming will be able to repay about 21 percent of the cost of these projects in a 50-year period. The remainder of the costs can and we believe should be repaid from power revenues from the units of the Colorado River storage project.

The future economy of the Colorado River Basin in Wyoming is primarily dependent on the use of Wyoming's Colorado River water

resources. Without the Colorado River storage project, the future development of this area would be very limited. The early authorization of the Colorado River storage project and participating projects is especially important to the Rock Springs area. Because of the slump in the coal-mining activities, the Rock Springs area is today an economic distress area. Information in regard to the Rock Springs situation was presented by the Wyoming Natural Resources Board at the House hearings on these projects, and I refer you to pages 295 and 296 of the House hearings on House bills H. R. 4449, H. R. 4443, and H. R. 4463.

The plan of development for the use of the water resources of the upper Colorado River Basin proposed under this bill is, we believe, one that will result in the fullest ultimate development of the basin and its resources. The program is the result of many years of investigation by the Bureau of Reclamation and the upper Colorado River Basin States. The proposed storage units are necessary to permit irrigation development in the upper basin. The storage units will furnish a source of power which will be needed to meet the expanding economy of the area. The storage units will enhance the recreational facilities of the area. The storage units will furnish benefits to fish and wildlife. The storage units will provide benefits to sediment control which will prolong the useful life of Lake Mead. The storage units and participating projects will provide water and power resources of the upper Colorado River Basin.

The completion of the units of the Colorado River storage project and the participating projects proposed and under this bill, will result in a total water use in the upper Colorado River Basin, which will be only about 50 percent of the water use allocated to the upper basin by the 1922 Colorado River compact.

In regard to Echo Park Reservoir—this unit is one of the very important units in the team of storage units necessary for the fullest development of the water resources of the Colorado River Basin. Its strategic location below the confluence of the Green and Yampa Rivers, its low evaporation losses and its contribution to maximum power production makes it an essential unit to the upper basin development. We acknowledge and appreciate the grandeur—and the spiritual and aesthetic values of the canyons at Echo Park. We do not believe the Echo Park Reservoir will destroy these values. Some of us in Wyoming, but not I, are even daredevils enough to appreciate running the river rapids in the Echo Park area. Echo Park Reservoir will eliminate some sections of these rapids—but there still are hundreds of miles of river rapids in the vast areas of the upper Colorado River Basin. Also we feel that the construction of Echo Park Reservoir will make the grandeur and the recreational values of this vast area available to tens of thousands of people every year—rather than to just the few hundreds that now have the opportunity. We feel that the evidence is clear that the people of this area were given assurance at the time the Dinosaur National Monument was extended to include the Echo Park area, that the establishment of this extensive monument would not interfere with the development of the water resources of the area.

In closing, I might summarize by saying we feel that the authorization of the Colorado River storage project and participating projects proposed under this bill is the essential first step in making pos-

sible the use of the water resources of the upper Colorado River Basin.

It is a step that determines the future economy of the area in Wyoming, and every other State of the upper basin. It is an important step in the development of the mineral resources of the entire upper Colorado River Basin. It is an important step in the development and fullest utilization of the recreational resources of the basin. Thank you.

That concludes my statement, Mr. Chairman. Thank you.

Senator WATKINS. Thank you, Mr. Person.

Senator BARRETT. Mr. Chairman, I would like to ask Dean Person a couple of questions. Isn't it true, Dean Person, that we have a shortage of power throughout Wyoming at the present time?

Mr. PERSON. Yes, sir; it is, Senator Barrett.

Senator BARRETT. And is it not also true, Dean Person, that in southwestern Wyoming there has been a considerable change in the employment possibilities for our people over there, first, because of the fact that the coal mines have been curtailed and in some instances closed down permanently, and secondly, that there has been chemical developments over there that have provided employment for a good many other people?

Mr. PERSON. Yes.

Senator BARRETT. And the possibility, then, of the development of a chemical industry in southwestern Wyoming will depend largely upon the amount of power that will be available and, of course, the cost of that power?

Mr. PERSON. I think that is unquestionably true, Senator Barrett.

Senator BARRETT. For that reason we in Wyoming are extremely interested in having this project constructed, first so that we can use the water to bring more irrigation underway, and secondly, that we can have the power for the economic development of Wyoming, and thirdly, so that the power will help pay the cost of the project?

Mr. PERSON. Yes, sir.

Senator BARRETT. I want to congratulate you, Dean Person, on your statement. I think it is an excellent statement.

Senator WATKINS. I join with Senator Barrett. Thank you very much.

Mr. PERSON. Thank you, gentlemen.

Senator WATKINS. At this point we will hear witnesses from the State of Texas.

Senator Daniel, whom I have already mentioned, will make a presentation before calling the first witness.

STATEMENT OF HON. PRICE DANIEL, UNITED STATES SENATOR FROM THE STATE OF TEXAS

Senator DANIEL. Could I ask Mr. Gregg and the other witnesses to come up to the table so you will be closer?

I may need your help for my own statement.

I regret to be in the position of objecting to any portion of this bill. I would like to be able to support the bill that is finally reported out of this committee. But I cannot do it with one project which is included in the bill but which was eliminated by the House committee.

I appeared before the House committee and made a statement objecting to that particular project and to that project alone. It is the San Juan-Chama project, which is noted with an arrow there on the map on the left. It is not shown on that map and is really, it seems to me, a project that could be very well left out of the overall Colorado River storage project and participating projects. The map that has been put up on the right side will show the diversion that is proposed by which certain waters will be impounded in the San Juan River and then diverted over into the Chama River.

About two-thirds of the waters of the Rio Grande, it is represented to us, come from the Chama River. The States of Colorado, New Mexico, and Texas have a compact on the waters of the Rio Grande River. Nowhere in this bill do we find any mention that the authority given here shall be in accordance with the terms of that compact or limited by that compact although we do find mention that other things authorized in this bill in the real Colorado River area shall be subject to the Colorado River compact and the upper Colorado River Basin compact.

The situation is this, as far as Texas and New Mexico are concerned: We have this compact by which certain waters are supposed to be released and come into the State of Texas. We have found in the past that some of the districts operating in New Mexico, including the Middle New Mexico Conservation District, have failed to live up to the compact. While attorney general, I had to file a lawsuit in the Supreme Court to try to prevent them from violating the terms of the compact. That lawsuit is still pending in the Supreme Court and has not been determined.

Mr. Chairman, we feel that if you authorize four new dams on the Chama River and the projects that are contemplated by this bill with reference to San Juan-Chama, that the opportunity will be presented to hold even more water in violation of the Rio Grande compact, and that if you have the power project as set up and proposed in this legislation, it will be necessary to keep water impounded in violation of the compact between the States.

We feel it would have a disastrous effect on some below this dam, on the Chama River. Some are authorized and we have two already in operation. Down below the proposed new dams, we have the Elephant Butte Dam and Reservoir, which is shown on the bottom of the map there on the right.

From that Elephant Butte Reservoir we find that lands are watered in New Mexico and in Hudspeth and El Paso counties of Texas. To your left you will see Elephant Butte Reservoir.

When the water is held in any of these reservoirs up above there in violation of the compact. Elephant Butte Reservoir does not receive what it is entitled to under the terms of the compact. Mind you, that is in New Mexico, and there are people in areas in New Mexico who feel the same way. We are a little further down now to El Paso.

Two countries near El Paso are in the Federal irrigation project and depend on this water. And then there are the counties that you feed in New Mexico. We feel that nothing should be done that would prejudice the Federal project that we have below there.

In reading over some of the testimony before the House committee, I find it is said by my good friend Senator Anderson, that there are more important needs for this water than the irrigation of some of these farmlands, needs which should have priority. We have already crossed that bridge from so far as this particular river and its waters are concerned. We already have this Federal irrigation project set up.

I believe that the figures will show that the lands that it is possible to farm by reason of the compact and by reason of Elephant Butte and the Federal irrigation district, are among some of the most valuable farmlands in the entire Nation. There is a total of 178,000 acres receiving project water. Seventy thousand irrigable acres of this land are in El Paso County, Tex., and 18,000 acres are in Hudspeth, Tex. Ninety thousand acres are in Dona Ana and Sierra Counties, N. Mex.

Senator WATKINS. Are they all served by the Elephant Butte Dam?

Senator DANIEL. That is correct.

Senator ANDERSON. And the Caballo Dam, which is just below.

Senator DANIEL. Mr. Chairman, that is our position. We feel that if these additional dams are authorized, constructed on the Chama River, that even more of our water would be taken in violation of the Rio Grande compact. As I say, I regret to appear here in opposition to anything in this bill, because you happened to have included in here something really, it seems to me, that can be left out of this overall Colorado River storage project. And the House did leave it out, the House committee. I hope it will be possible for this committee to leave it out so that the Senator from Texas can support this highly worthwhile piece of legislation that you have here.

I regret that I am in conflict with my friends from New Mexico on this matter, because goodness knows I wish we could work together on it. But the way the situation now is, we cannot support it. We would have to oppose the broad authority given under this bill to proceed with the San Juan-Chama project.

Mr. Chairman, I ask permission to have inserted at this point in the record the statement that I made before the House committee.

Senator WATKINS. It may be received and placed in the record.

Senator DANIEL. It begins on page 244 of the hearings on the Colorado River storage project.

(Senator Daniel's remarks follow:)

REMARKS OF HON. PRICE DANIEL, UNITED STATES SENATOR FROM TEXAS BEFORE THE HOUSE COMMITTEE

Senator DANIEL. Mr. Chairman and members of the committee, I appreciate this privilege. I am a member of the companion committee in the Senate, and I am glad to have the honor of meeting with you. I will try to be brief.

It is my purpose to present objections to only one phase of the project or the bills that you have before you. On behalf of the State of Texas I find myself compelled to object to the inclusion of the San Juan-Chama project in this legislation. This is the only project included in the bill to which my statement and objections will refer.

The proposed project, that is, the San Juan River and Chama River project, would call for building new dams and reservoirs on the Chama River, 4 of them, having a combined storage capacity of 753,000 acre-feet of water. The proposal would call for diverting 235,000 acre-feet from the San Juan River over into the Chama River.

Now the Chama River is the principal source of water in the Rio Grande.

About two-thirds of all the water that we get in the Rio Grande for irrigation for certain projects—and I will explain them—below Elephant Butte Dam on the Rio Grande comes from the Chama River, and that is our interest and our objection to this piece of proposed legislation. We believe that it would seriously harm already established Federal irrigation projects on the Rio Grande. I refer to the Rio Grande Federal irrigation project which obtains water from the Rio Grande, two-thirds of which comes from the Chama River, and which irrigates about 178,000 acres of land in the southeastern part of New Mexico below Elephant Butte Dam and in the El Paso area of Texas.

This proposed project for the construction of these new dams and reservoirs on the Chama River would have a combined storage of 753,000 acre-feet of water. Of course, much more water than was proposed to divert from the San Juan River.

El Vado Reservoir on the Chama River now has a storage capacity of 198,000 acre-feet. Under the Flood Control Act of 1948 the United States engineers were authorized to build Chamita Dam and Reservoir with a capacity of 700,000 acre-feet without spillway gates, or 965,000 acre-feet with spillway gates installed. Those having a total in El Vado and the authorized Chamita Dam Reservoir for proposed storage by the Bureau of Reclamation of 1,916,000 acre-feet.

As I have already said, two-thirds of the water that we get in the Rio Grande in southeastern New Mexico and in the El Paso area of Texas comes from the Chama River. We have in that area of Texas 70,000 acres of fertile land in the Rio Grande project in El Paso County, Tex., now being irrigated, and 18,000 acres of land in El Paso and Hudspeth Counties, Tex., are dependent upon this water that is supposed to flow into Elephant Butte Dam—supposed to flow into Elephant Butte Dam in accordance with the compact that has been entered into between the States of Colorado, New Mexico, and Texas.

In addition to these lands in Texas there are 90,000 irrigable acres of rich land in Dona Anna and Sierra Counties, N. Mex., which are likewise dependent upon water from Elephant Butte Dam, making a total of 178,000 acres receiving project water. These lands are highly improved and represent millions of dollars in value. What they are worth to the economy of the territory in which they are situated is almost beyond calculation.

I am informed, Mr. Chairman, that the Rio Grande Federal irrigation project which serves these areas in New Mexico and Texas below Elephant Butte Dam ranks second or third in the United States as to the value of crops produced on the lands irrigated, and it is one of the few irrigation projects that is paying its construction costs to the Government.

If these new dams and reservoirs are constructed on the Chama River and operated as it is proposed in this legislation, it can only

result in diminishing the supply of water to the Rio Grande project and to this rich land that is now being cultivated in the areas of New Mexico and Texas. This would not to such an extent as to seriously threaten the existence of the project, and I say that because, while serving as attorney general of the State of Texas, I found what serious damage it could cause even with the El Vado Dam and Reservoir and the manner in which it was operated on the Chama River, the one now in existence.

I saw what damage it could cause to our State and to the southeastern part of New Mexico. As of December 31, 1952, New Mexico had failed to deliver into Elephant Butte Reservoir on the Rio Grande approximately 460,000 acre-feet of water required by the Rio Grande compact to be delivered into Elephant Butte. This is more than twice the debit permitted New Mexico by the terms of the compact. It became my duty, as the attorney general of Texas, to file suit against the El Vado or the Middle Conservancy District there in New Mexico and the State of New Mexico. We had cooperation from certain New Mexico officials, but not from the conservancy district operating the El Vado Reservoir and Dam. It became a very serious thing because of the drought that we had, and we were denied the water. The water was held up and not allowed to come into Elephant Butte Dam in accordance with the Rio Grande compact.

So, Mr. Chairman and members of the committee, if more reservoirs are built on the Chama River, some having much larger capacity than El Vado, and the impounded waters are used for developing new land and for generation of hydroelectric power and industrial and municipal purposes in New Mexico above the Elephant Butte Reservoir, the inevitable result will be a greatly diminished supply of water for the Rio Grande project, with consequent disaster for landowners and the economy of the area.

I regret to have to oppose this project in a neighboring State, but we had a compact with the State as to the use of those waters, and the State has not lived up to the compact because of one reservoir and the manner in which it is operated on the Chama River, and we fear the authorization of these additional projects on the Chama River.

I want to thank the committee for giving me this opportunity to present these objections on behalf of the State of Texas to the inclusion of this one particular project in the legislation now before you.

Senator WATKINS. I would like to ask you a question, Senator, before your witnesses start to testify.

Since Senator Anderson is here representing New Mexico, would there be any objection on the part of either of the States to an amendment to this bill providing that the operation of that project should be in accordance with the pact between the two States?

Senator DANIEL. I think that should be included, if the San Juan-Chama project is going to be included in the bill. Certainly, and Senator—

Senator ANDERSON. I was just wondering if you want to do that with all of them. You would not want to pick one out separately. The Denver people were in here and wanted to have the Denver Blue River diversion. That is a transmountain diversion the same as the others. It moves water out of the Colorado River over into the Arkansas, which is subject to treaty and subject to compact.

Senator WATKINS. The Colorado compact, as you will remember, is recognized in this bill. And it is the law of the river.

Senator ANDERSON. What I am trying to get to is, shall we include every compact that covers the Colorado River? We certainly ought to put the Arkansas-White in, because of the transmountain diversion. The Big Thompson involves the same thing. The city of Los Angeles has a transmountain diversion that takes water from the areas along the Colorado River and puts it into the city of Los Angeles. We have never raised this question on a transmountain diversion as to whether it should be in accordance with a compact.

Senator WATKINS. I asked the question; I am not making the argument one way or the other. I think it is worth your consideration, however.

For instance, the present operation of the stream, I take it, is governed by the compact entered into between New Mexico and Texas.

Senator ANDERSON. Yes.

Senator WATKINS. If it is, it may be necessary somewhere along the line to give some recognition to that compact. As I understood from the testimony that was presented by New Mexico witnesses yesterday, there is an alternate program for offstream storage of this water, and that would eliminate, as I remember, some of these power dams.

Senator ANDERSON. That eliminates the power dams in the present program of the Bureau of Reclamation.

Senator WATKINS. And about all they would use the Chama River for in connection with the San Juan-Chama project, as proposed by New Mexico, would be to transport the water down to the place where they would take it out of the stream and store it.

I have been thinking about that. If that is the fact, I do not see how on earth the Texas people could be prejudiced by using the channel of the river to convey the water. It can be measured in and measured out. That is done every day through the United States.

Senator DANIEL. You understand, I am appearing here in opposition to what is in the bill.

Senator WATKINS. We are looking forward to what we can put into the bill to take care of the objection you have raised.

Senator DANIEL. I would like you to direct that question to the witnesses who will be here and who are more familiar with that than I am. Certainly that puts a different light on the matter. If the bill were amended, it would take care of the situation that I have objected to and would certainly put a different light on the matter.

Senator WATKINS. I can say this, I don't think there are any of the upper Colorado Basin States that want to violate any of the compacts made with any of the States. We are offering in this bill to comply with the Colorado River compact of 1922 and also the upper Colorado River compact of 1948.

Those are the two measures under which we would have to operate.

Senator DANIEL. That is correct. And as I pointed out, you specifically say so.

Senator WATKINS. That is correct. Any compact in connection with any other river basin that Congress has ratified and which might

be affected by a diversion of this water should also, in my opinion, be given some recognition, because Congress has approved them, and they thereby became the law of the land.

Senator DANIEL. That is correct. Some will say go to court and force the compact. If Congress should pass this bill, and if those operating the dams and the projects did, as we find was done at El Vado by the Middle Conservation District, violate the compact, we have gone to court and I think we have been about 2 years in court and have not gotten a hearing yet. The special master held that the United States was a necessary party, and that is where we now stand in the matter. It is pretty difficult at times to get the courts to act on these matters as fast as we think maybe they should.

I want to say this, that this complaint is not being made against all of New Mexico. There are a lot of citizens and officials of New Mexico that have certainly tried to live up to the Rio Grande compact. Many of them have. Many of them in New Mexico are affected by the compact on the same side as Texas, as I pointed out. As Mr. Gregg will show here in a minute, too.

I would like, Mr. Chairman, to introduce these four witnesses at one time, so if I should happen to leave a little early, I will have performed that much.

First was Mr. John L. Gregg, manager of the Elephant Butte Irrigation District of Las Cruces, N. Mex.

Next, Mr. A. P. Rollins, member of the Texas Board of Engineers.

Next is Mr. Scott, Rio Grande compact commissioner for Texas. He will be here in a minute.

Next is Mr. N. B. Phillips, manager, El Paso Water Improvement District No. 1, El Paso.

Mr. Gregg.

Senator ANDERSON. Could I say, Mr. Chairman, that I believe if we would look at the project from the way it was presented, we might eliminate some of the difficulties that seem to be ahead of us in some of the testimony. For example, there is nothing in this bill that talks about power dams. Only in this bill does it talk about a San Juan-Chama project. Therefore, if the Bureau of Reclamation people can state that they are going to survey this project without power dams, if that is what their presentation is going to be, then it seems to me unnecessary to prove that power dams are going to be a bad thing.

Secondly, the bill provides that no appropriation for or construction of the San Juan-Chama project or the Shiprock-South San Juan Indian irrigation project shall be made or begun until coordinated reports thereon shall have been submitted to the affected States pursuant to the act of December 22, 1944, and approved by the Congress.

So that if there ever was a project that was proposed that had any real danger, there would be plenty of opportunity for Texas to present that fact when it came before the Congress.

As it is now, Texas objects to the use of the Chama River to transport San Juan water down the stream which will be of benefit to the farmers in their own irrigation district, and would provide a municipal water supply to the city of Albuquerque. We cannot understand why they object to the use of the river for that. If we have to bring it down by pipeline, it is possible to do so. There is no one in New Mexico that I know of who lives north of the Elephant Butte Dam

who objects to that, when power dams have not been considered and have not been considered for many months.

Senator WATKINS. There may be an idea that you don't keep your compacts up.

Senator ANDERSON. It is in the court now. Fundamentally it comes down to the point where my farm, which is north of Elephant Butte and has been under irrigation for 250 years, has an inferior water right to the people of Texas who brought the land under irrigation in the last 50 years.

If they say we don't operate the compact correctly, it isn't the State of New Mexico that is not operating correctly. God doesn't operate it correctly. He doesn't let enough water fall in the watershed or doesn't put enough snow in the mountains. We are unable to do anything about that. We have talked to Him but nothing happens. I don't believe, Mr. Chairman, that there is a conflict in here that ought not to be resolved.

As far as I am concerned, and I can't speak for anybody else, as for as I am concerned I don't want to write a thing in this bill that is going to jeopardize the water rights of the people who live below Elephant Butte Dam. I never have sought to do it; I don't seek to do it now, and I don't believe the official position of the State of New Mexico seeks to do that either.

The Governor of the State, who is in full accord with the development program, lives below the Elephant Butte Dam, and has nearly all of his life. He has been connected with the farm groups down there. I can't believe that he is trying to damage them. I can only say to you that if testimony can tell us how these projects without power dams are going to be of detriment to the people in the lower valley, I think it would help us a lot.

Senator WATKINS. There is one phase that may have been overlooked or not understood. That is this: All this bill seeks to do in reference to that particular project is to authorize further studies, and the project will have to get through the Congress before any money can be spent on it at all. When you keep that in mind it makes a kind of different picture. This bill authorizes the overall idea for the full development of the area.

As of now, how some of the projects are to be built and operated has not yet been completely studied. In other words, more work has to be done on them, and for that reason they have to come before the Congress again for authorization.

That is the understanding I have with reference to this quite large group of projects, where the studies have not been complete, and plans have not been worked out.

After I heard the New Mexico witness testify with relation to this, I believe about all that they would require would be the use of the river for transporting the water from the point where it would come out of the diversion tunnel or canal, into the Chama, down to where it would be taken out into the reservoir.

Senator DANIEL. Mr. Chairman, I am sorry but I have not had the privilege or opportunity to read the testimony before this committee given by the witnesses from New Mexico as to how they propose to change the project.

All I have been able to go on for the last day or two has been the fact that before the House committee these dams were sought.

Senator ANDERSON. That is correct.

Senator DANIEL. Senator Anderson is very strong in his advocacy of these dams on the Chama River. In the bill that is now before the Senate, they are authorized, including, as I read it, the hydroelectric power, generation of hydroelectric power, dams that would make that possible.

Now, Mr. Chairman, let me ask you this in line with what was said a moment ago by the chairman.

What does this bill authorize? I am reading the proviso that I am sure the chairman is referring to, on page 3, beginning on line 4. It provides that—

No appropriation for or construction of the San Juan-Chama project or the Shiprock-South San Juan Indian project shall be made or begun until coordinated reports thereon shall have been submitted to the affected States pursuant to the act of December 22, 1944, and approved by the Congress.

In view of that, what is authorized by this bill with reference to the San Juan-Chama project?

Senator ANDERSON. Am I not correct in saying that all that is authorized is a feasibility report, and if that feasibility report is also approved by the Congress at a subsequent date, then it goes in as a participating project?

This bill is a pure authorization for a feasibility report.

Senator DANIEL. Does it authorize a survey?

Senator WATKINS. Yes.

Senator DANIEL. Expenditure of funds for surveys?

Senator WATKINS. We have had money each year, making annual appropriations, and that has been going on for a long time.

Senator DANIEL. On the San Juan-Chama project?

Senator WATKINS. I understand so. We have the reclamation engineer, the regional director, who testified as to the investigation. That is the part of the overall program that the Bureau of Reclamation does under the general program.

On the upper Colorado we have \$500,000 annually that comes from the revenues from Hoover Dam. That is spent for basin studies and planning. I don't know if any of that is spent on the Chama or not.

Senator ANDERSON. May I say that I do not express surprise that there is concern over this from the State of Texas. I think they were justified in making studies of it. I want to be sure that we put into the records of this hearing the fact that as far as I am concerned, and as far as I believe anyone else in New Mexico is concerned, that we would continue to operate the San Juan diversion if built in a fashion that would not jeopardize the water rights, but which would add water to the people below Elephant Butte Dam. No other purpose so far as I know is in any way planned. Certainly the construction of the dams on the Chama which were contemplated were not discussed on the basis of reorganizing the stream and interfering with the Rio Grande compact. It was only when, as I say, water got scarce, and we got into arguments as to how the compact was being discussed, that, so far as I know people became worried about these power dams. When the water is scarce they have a right to be worried, and I have never said to my good friend from Texas that he shouldn't have been worried.

But let me point out, Mr. Chairman, that the very same thing has happened in the Rio Grande that is happening in the Colorado. If

you look at the stream flow of the Colorado, which I believe is on page 151 of these House hearings, starting out about 1934 or so, when it was down to 3 million historical flow and a 5 million virgin flow, there haven't been but 2 years, since that time, that there has been enough water in the river to satisfy the compact provisions.

We always draw these treaties so that the upper States, where the water generates and comes from, are the residual legatees. They get what is left, after they have fulfilled their obligations to the lower basin States.

Senator WATKINS. Is that the same on the Rio Grande compact between Texas and New Mexico?

Senator ANDERSON. Yes, indeed. Texas gets what is guaranteed to it, and the Republic of Mexico gets what is guaranteed to it, and we get what is left. The same thing happens with the 7½ million acre-feet in the Colorado compact. They say "Give us 7½ million acre-feet every year in California, and if there is only 1 million acre-feet left for Colorado, Arizona, and New Mexico, it is your own fault."

I don't subscribe to that, and that is why I would like to see these storage places built, so we can store it if there are any good years. But if you will take the record of the Colorado River from 1929 or 1930 and carry it to the present date, and try to visualize what would have happened if we had tried to build these storage places and fill them, you will see we never would have been able to put any water in the storage places and keep it there, we would only have been storing it to fulfill our obligations to the lower basin States.

Senator WATKINS. The testimony was that even during the whole period you wouldn't have been able to fill them.

Senator ANDERSON. I am not saying that you could not have filled them if you used the water in the upper basin. I am saying if you look at the table there and start with 1930 when they had 14 million acre-feet, and try to add all of those together and divide them by 15, you will find that there is a smaller number there than the number of years. In other words, there has never been sufficient to produce 15 million acre-feet and there cannot be.

Senator WATKINS. It could not be filled in any 1 year.

Senator ANDERSON. No. If you still use 7½ million feet in the upper basin States and lower basin States, you are not going to have a chance to fill anything at any time.

Senator WATKINS. You cannot hope to use that in the upper basin States.

Senator ANDERSON. Not for many years. That is exactly the situation in the Rio Grande Valley. In the Rio Grande compact, we have water rights for well over 100,000 acres and there was even a stipulation that came through that we could use water for an additional 10,000 acres that was going to be developed. Nobody has ever talked about using the extra 10,000 acres. We do not even use 100,000 acres. We are only trying to irrigate 75,000 acres and we haven't got nearly enough water to do that. The amount of lands under irrigation shrinks year by year. But the complaint comes that we do not operate the compact so as to live up to our agreements. But the fact is that there is not the water in the river.

Senator DANIEL. Mr. Chairman, the Senator from New Mexico is describing how the compact is supposed to work. But I want to say

that it has not worked out in that way. As of December 31, 1952, New Mexico failed to deliver in Elephant Butte Reservoir approximately 460,000 acre-feet of water required by the Rio Grande compact. This is more than twice the debit permitted New Mexico by the terms of the compact.

Mr. Chairman, a minute ago I was trying to tell you how this agricultural area below in the Federal irrigation district below Elephant Butte ranks in the Nation. I have the statement here that I was looking for a minute ago. I am informed that it ranks second or third in the United States in value of crops produced and it is one of the few irrigation projects that is paying its construction costs to the Government. It is certainly an area that we don't want to see damaged any further by what might be done on the Chama River. I am glad to hear Senator Anderson say that it is possible that things could be worked out where these dams would not be built, would not impound water in violation of the compact. We just want to be sure of it.

I would like to introduce at this time a letter addressed to the chairman of our full committee, the Honorable Hugh Butler, from the Governor of Texas, opposing this part of the bill, only the San Juan-Chama part.

Senator WATKINS. We will make it a part of the record.
(The letter referred to follows:)

EXECUTIVE DEPARTMENT,
Austin, Tex., January 12, 1954.

Hon. HUGH BUTLER,
*Chairman, Committee on Interior and Insular Affairs
of the United States Senate, Washington 25, D. C.*

DEAR SENATOR BUTLER: There has come to my attention an interim report on the San Juan-Chama project, San Juan River and Rio Grande Basins, Colo. and N. Mex., which was prepared by the Bureau of Reclamation.

A review of this interim report reveals that the proposed project contemplates the impounding of water in the San Juan River Basin, a tributary of the Colorado River watershed, and diverted therefrom into the Rio Grande watershed approximately 235,000 acre-feet per annum. The water, when it reaches the Rio Grande watershed, is to be impounded by a series of dams and is to be released primarily for the production of power.

On page 17 of the interim report in the first paragraph, beginning with the third sentence, we find the following statement:

"The project plan is based on fullest practicable utilization of the flows of the Rio Chama and its tributaries for development of hydroelectric power in conjunction with the flows diverted from the west slope."

Records indicate that the Rio Chama is the largest contributing tributary of the Rio Grande. It is evident, therefore, that the flows from the Rio Chama are the principal supply for the Elephant Butte Reservoir. The flows which add most to the storage behind the Elephant Butte Dam occur in the late spring and early summer as a result of melting snow and spring rains along the Continental Divide.

Article VIII of the Rio Grande compact reads:

"Neither Colorado nor New Mexico shall increase the amount of water in storage in reservoirs constructed after 1929 whenever there is less than 400,000 acre-feet of usable water in project storage; provided, that if the actual releases of usable water from the beginning of the calendar year following the effective date of this compact, or from the beginning of the calendar year following actual spill, have aggregated more than an average of 790,000 acre-feet per annum, the time at which such minimum stage is reached shall be adjusted to compensate for the difference between the total actual release and releases at such average rate; provided further, that Colorado or New Mexico, or both, may relinquish accrued credits at any time, and Texas may accept such relinquished water, and in such event the State or States so relinquishing shall be entitled to store water in the amount of the water so relinquished."

It will be noted that the operation of the San Juan-Chama project "for the fullest practicable utilization of the flows of the Rio Chama and its tributaries for development of hydroelectric power in conjunction with flows diverted from the west slope" would be in violation of article VII of the Rio Grande compact, as set out above, and would adversely affect the water supply for El Paso, Tex., and for El Paso and Hudspeth Counties.

The Rio Grande compact has been ratified by the States of Colorado, New Mexico, and Texas, and by the Congress of the United States. Therefore, as Governor of Texas, I must respectfully request that your committee insist upon compliance with the terms and provisions of the Rio Grande compact by each of the three States and by the Federal Government. And we further respectfully request that your committee authorize no project which will be in conflict with the terms of the Rio Grande compact.

Sincerely yours,

ALLAN SHIVERS.

Senator WATKINS. Gentlemen, it is near the noon recess time. I think we better recess and we will reconvene at 2 o'clock.

Senator DANIEL. Has Mr. Scott come in?

Our first witness after lunch will be Mr. Gregg, who has been introduced.

Senator WATKINS. We will be in recess until 2 o'clock.

(Whereupon, at 12:30 p. m. the committee was recessed, to reconvene at 2 p. m. the same day.)

AFTERNOON SESSION

The hearing was resumed at 2 p. m.

Senator WATKINS. Mr. Gregg, you may proceed.

STATEMENT OF JOHN L. GREGG, MANAGER, ELEPHANT BUTTE IRRIGATION DISTRICT, DONA ANA AND SIERRA COUNTIES, N. MEX.

Mr. GREGG. Mr. Chairman and members of the committee, my name is John L. Gregg. I am the manager of the Elephant Butte Irrigation District, located in Dona Ana and Sierra Counties in south central New Mexico. The district forms the New Mexico portion of the Federal Rio Grande project (New Mexico-Texas) and obtains its water supply entirely from the Rio Grande. The Rio Grande project is one of the older Federal reclamation projects and contains 160,000 acres of highly productive land, of which 90,000 acres are located in New Mexico. This statement is authorized by the board of directors of the Elephant Butte Irrigation District.

The Elephant Butte Irrigation District is opposed to the authorization of the San Juan-Chama project, a participating project listed for authorization on page 2, lines 23 and 24, of S. 1555, as originally introduced. The bill further provides on page 3, lines 4 to 10, inclusive, that no appropriation shall be made for, or construction begun on, the San Juan-Chama project until the customary feasibility report has been prepared and submitted to the affected States and approved by the Congress.

Our interpretation of the language contained in S. 1555 with reference to the San Juan-Chama project is that the Congress is being asked to authorize the San Juan-Chama project in advance of adequate investigation and the preparation of a report containing suf-

ficient basic information to determine whether or not the project is feasible and should be authorized.

This unusual procedure is requested with reference to a project estimated to cost \$228 million and which will involve a substantial portion of the water supply of downstream areas, including the Elephant Butte Irrigation District.

The Bureau of Reclamation has prepared an "interim," or reconnaissance, report on the San Juan-Chama project. The Bureau frankly admits that this report is far below feasibility grade. It merely contains such scattered and incomplete information as is now available concerning the proposed San Juan-Chama project.

This incomplete "interim" report indicates, in a general way, that the purpose of the San Juan-Chama project is to deliver 235,000 acre-feet of water per annum from the headwaters of the San Juan River, a tributary of the Colorado River, via a transmountain diversion system, into the headwaters of the Chama River, in northwestern New Mexico, which is the principal New Mexico tributary of the Rio Grande. This water is intended primarily for municipal and supplemental irrigation uses in northern New Mexico. The project also includes the construction of dams on the Chama River that would create 750,000 acre-feet of new reservoir capacity on that stream for regulation purposes and for the production of power. We ordinarily obtain a substantial portion of our water supply from the Chama River. New diversions of water from the Rio Grande for municipal purposes would be authorized, as well as increased diversions from Rio Grande tributaries for irrigation purposes.

A substantial portion of our water supply would become involved in, and would be affected by, additional storage on the Chama, as well as by the proposed new and increased diversions. We would, in effect, lose control over that part of our water supply originating in the Chama River. The Elephant Butte irrigation district, therefore, opposes authorization of the San Juan-Chama project for the following reasons:

1. Accurate and complete information is lacking in regard to project features and proposed methods of operation. We do not believe that, in all fairness, any irrigated area should be expected to accept a complicated and far-reaching project, that involves a substantial portion of its water supply, in the absence of complete and reliable information regarding proposed project features and methods of operation. We are not willing to risk the welfare of our district on the blind assumption, unsupported by adequate information, that the San Juan-Chama project can, and will, be built and operated so that it will not interfere with our water supply. In all fairness to downstream irrigated areas, before it is given serious consideration for authorization, the San Juan-Chama project should be thoroughly studied, a report of feasibility grade prepared and submitted to all affected interests in accordance with procedure established by law. Anything less than this would be an imposition upon downstream areas that would be directly affected by the project. The unusual authorization procedure that is requested in connection with the San Juan-Chama project seems to deviate widely from the customary procedure followed in investigating, reporting upon, and submitting to affected interests for comment, proposed projects for which authorization is desired.

2. Our water supply is not effectively protected, under present conditions, by the Rio Grande compact. This is an interstate compact among Colorado, New Mexico, and Texas, ratified by the States and approved by Congress in 1939, and which was intended to divide the waters of the upper Rio Grande among the three States. For purposes of compact administration, the Elephant Butte irrigation district was placed under the protection of Texas, although the district is located entirely in New Mexico. This was done because the district is part of an interstate project extending into the State of Texas. Under normal conditions, the Rio Grande compact might be relied upon to protect our water supply against improper operation of upstream projects, provided such projects are soundly planned and built. However, during the past few years the Rio Grande compact has been completely ineffective as a means of protecting our water supply against improper storage and diversion upstream. Our present situation affords a striking example of what happens to downstream areas when interstate compacts fail to function. Our water supply now approaches the exhaustion point, due to a combination of drouth conditions and upstream diversion and storage of water in violation of the provisions of the Rio Grande compact. Many small farmers in our district, unable to afford irrigation wells, are in serious danger of losing their crops within the next 60 days. At a time when we face the most desperate situation in the history of the Rio Grande project, we are unable to obtain a fair share of such flow as is available in the Rio Grande, and substantial storage of water in an upstream reservoir, contrary to the provisions of the compact, has occurred. The compact was intended to protect us against such contingencies.

The Rio Grande compact is now the subject of litigation pending before the Supreme Court of the United States. The suit was filed by Texas against New Mexico for the purpose of obtaining enforcement of various provisions of the compact. For all practical purposes, the Rio Grande compact is inoperative at the present time and this situation promises to continue for some time in the future. The State of New Mexico is attempting to delay, or to evade, enforcement of the provisions of the Rio Grande compact by claiming that the United States is an indispensable party to the suit. The same State of New Mexico, whose disregard of the provisions of an interstate compact has contributed greatly to the difficulties of its own citizens in southern New Mexico, is also the leading advocate of the San Juan-Chama project. Until such time as law and order are restored along the Rio Grande in New Mexico, and the Rio Grande compact operates effectively to protect our water supply, we are compelled, as a result of bitter experience, to oppose upstream projects that involve, in any way, our water supply. In the absence of effective protection by interstate compact, additional projects, such as the San Juan-Chama, would merely make our present situation worse by increasing the opportunity for upstream encroachment upon our water supply. We feel that any irrigated area in the west would be compelled to adopt the same policy under similar conditions wherein the failure of an interstate compact to effectively protect its water supply exposes that area to upstream encroachment.

The San Juan-Chama project has not received the approval of the Bureau of the Budget, or of the Department of the Interior. Au-

thorization of the project was denied by the House Committee on Interior and Insular Affairs.

On behalf of the Elephant Butte irrigation district, it is respectfully requested that this committee also refuse to authorize the San Juan-Chama project.

Mr. Chairman, I would like to submit for inclusion in the record a resolution approved by the Dona Ana County Farm and Livestock Bureau in opposition to the proposed San Juan-Chama project.

Senator WATKINS. That may be received in the record.

(The material referred to is as follows:)

DONA ANA COUNTY FARM AND LIVESTOCK BUREAU,
Las Cruces, N. Mex., June 24, 1954.

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS.

United States Senate, Washington 25, D. C.

GENTLEMEN: The board of directors of the Dona Ana County Farm and Livestock Bureau, representing 1,460 farm families in Dona Ana County, N. Mex., at a meeting held in Las Cruces, N. Mex., on June 23, 1954, unanimously approved the following resolution in opposition to the proposed San Juan-Chama project, which is included for authorization in S. 1555:

The proposed San Juan-Chama project involves the creation of 750,000 acre-feet of additional storage capacity on the Rio Chama, from which we ordinarily obtain a substantial portion of our water supply, which will completely control the flow of that stream. The San Juan-Chama project would make possible new diversions of water along the Rio Grande and its tributaries as well as increase several already existing diversions. There is no assurance that the additional reservoirs would be so operated, or that the new and increased diversions would be so regulated, as to avoid interference with our present water supply, which originates entirely within the Rio Grande Basin. The Rio Grande compact, upon which we might ordinarily rely for protection, has been repeatedly violated and we have been deprived of water to which we are entitled during a period of critical shortage. Under such circumstances, we oppose the San Juan-Chama project because experience on the Rio Grande in New Mexico indicates that the construction and operation of this project would place a substantial portion of our water supply in jeopardy.

Very truly yours,

C. W. STRINGER, *President.*

Senator WATKINS. Thank you very much.

Senator ANDERSON. Mr. Gregg, in your testimony you referred to this project as diverting 235,000 acre-feet of water from the headwaters of the San Juan River into the headwaters of the Chama and providing for the production of dams on the Chama River that would create 750,000 acre-feet of new reservoir capacity on that stream for regulation purposes and for the production of power. Have you been a member of the statewide committee on water control? Or let me put it this way and make it easier: Have you been at Santa Fe when they have had conferences with reference to the utilization of water from the San Juan River?

Mr. GREGG. Yes, I have attended a good many conferences, and I was a member of the governors' allocation committee on the San Juan-Chama project, which had its last meeting a good many months ago.

Senator ANDERSON. At the last meeting that you attended, was there discussion of the San Juan-Chama project?

Mr. GREGG. Yes; because this particular project was the sole subject which the committee was authorized to handle.

Senator ANDERSON. Did they discuss it at that time as only a project that could use power dams, or did they discuss the possibility of elimination of power dams?

Mr. GREGG. My recollection is that the project, as it was discussed then, is the same project that I have described in my statement here, and that there was no reference to the elimination of dams.

Senator ANDERSON. If other witnesses could persuade you that there was reference to the elimination of dams, would it improve your feeling about the bill any?

Mr. GREGG. It might, to some extent. However, the only project of which we have any knowledge is the project that I have described in the statement. Anything separate or apart from that is just purely conversation; that is, there have been no official statements on the matter, to my knowledge.

Senator ANDERSON. Well, let me see if I can take it out of the conversation stage.

On February 23, 1954, Mr. John Erickson, who is the New Mexico State engineer, and who is an upper Colorado commissioner, sent to Mr. Louis Scott of the Rio Grande Compact Commission for Texas, a letter. He sent carbon copies to a few people.

Has your attention been called to that letter?

Mr. GREGG. Possibly; although I don't recall the exact letter that you have reference to.

Senator ANDERSON. Well, I would like, Mr. Chairman, to have permission to put into the record at this time the letter from Mr. Erickson to Mr. Scott and copy of Mr. Scott's reply under date of March 12, 1954.

I will have to supply these for the record later, because I do not have any copies of them.

Senator WATKINS. That may be received for the record.

(The material referred to is as follows:)

FEBRUARY 23, 1954.

Mr. LOUIS A. SCOTT,

Rio Grande Compact Commissioner for Texas, El Paso, Tex.

DEAR LOUIS: This letter is with reference to the meeting in Governor Mechem's office on February 17 which was attended by you, N. B. Phillips, W. B. Gray, John Gregg, Col. Henry F. Hannis, John Mutz, and myself; and to a later conference you had with Colonel Hannis, John Mutz, and myself on Friday.

The Governor is very desirous of exploring every avenue of possible agreement between Texas and New Mexico with regard to inclusion of the San Juan-Chama project as a participating project in the Colorado River storage project bill now being considered by the Congress. It is his feeling that new water in the Rio Grande basin should relieve some of the pressures on the use of the Rio Grande water. Any relief of that nature would automatically benefit the whole basin. He feels that you certainly should be interested in the importation of new water to the basin.

In my discussions with Colonel Hannis and John Mutz, it appears that a provision in the authorization bill might be acceptable to them along the following lines:

"Provided further, That the provisional authorization of the San Juan-Chama project will be limited to a project for water use only, exclusive of power, and limited to storage capacity sufficient to control and regulate only the imported water with a dam or dams for this purpose to be located if possible on Willow Creek (the provision for future power is in no way prejudiced by this exclusion but must be made a feature for separate authorization); no appropriation shall be made until an operational plan shall be developed for the use of imported water and the use of Rio Grande water in exchange for imported water to assure that the delivery of Rio Grande water or its equivalent to present users will not be interfered with and all operations shall be in conformity with the Rio Grande compact."

That or a similar provision could be inserted at line 10 of page 3 of H. R. 4449 immediately following the provision for feasibility reports.

This suggestion is made as a possible basis for future discussion and it is suggested that if there is in this suggestion a basis for negotiation, that a meeting be held with congressional representatives of the two States and possibly also from Colorado some time during the Senate hearings on the Colorado River storage project which may be held early in March.

Your favorable consideration of this matter will be greatly appreciated.

Sincerely,

JOHN R. ERICKSON,
Upper Colorado River Commissioner for New Mexico.

MARCH 12, 1954.

Re San Juan-Chama project

Mr. JOHN R. ERICKSON,

*Rio Grande Compact Commissioner for New Mexico,
State Engineer's Office, Santa Fe, N. Mex.*

DEAR JOHN: Copies of your letter of February 23 were furnished to Mr. A. P. Rollins, a member of the Texas Board of Water Engineers; Mr. N. B. Phillips, manager of El Paso County water improvement district No. 1; and John L. Gregg, manager of Elephant Butte irrigation district.

On March 3 I was in Austin and discussed the matter in person with Mr. H. A. Beckwith, chairman of the board of water engineers, and Mr. Rollins. Messrs Beckwith and Rollins are of the opinion that the opposition of the State of Texas to the San Juan-Chama project should not be withdrawn until a feasibility report establishing the economic justification of the project is prepared and submitted to the affected States for their approval or further objections, in the event such a report does not satisfy the State of Texas. Messrs. Beckwith and Rollins informed me that it is the uniform rule and practice of the board of water engineers not to approve or authorize any permit for the appropriation of public waters of Texas until after a feasibility report establishing economic justification has been submitted to the board. They do not wish to depart from this established policy, where waters of the Rio Grande are concerned.

I have also discussed your letter with Messrs. Gregg and Phillips. Each of them has taken the matter up with his board of directors, and I am advised that both boards are opposed to the project, and have instructed their respective managers to continue the opposition of each district to the project.

This qualifying language contained in your letter as a suggested amendment to H. R. 4449 does not meet with the approval of either district. It is my personal opinion that the language does not go far enough, but in view of the seemingly unalterable opposition of all interested parties to authorization of the project, prior to a feasibility report establishing economic justification, I see no point in trying to agree on amendatory provisions to be inserted in the bill.

Sincerely yours,

LOUIS A. SCOTT,
Rio Grande Compact Commissioner of Texas.

Senator ANDERSON. Now, at that time, Mr. Gregg, the suggestion was made by Mr. Erickson that it might be possible to work out some sort of an amendment that would be suitable, and I just wonder if I could get your comment on an amendment of this nature that might be added to the bill:

Provided further, That the provisional authorization of the San Juan-Chama project will be limited to a project for water use only, exclusive of power, and limited to storage capacity sufficient to control and regulate only the imported water with a dam or dams for this purpose to be located if possible on Willow Creek, no appropriation shall be made until an operational plan shall be developed for the use of imported water and the use of Rio Grande water in exchange for imported water to assure that the delivery of Rio Grande water or its equivalent to present users will not be interfered with and all operations shall be in conformity with the Rio Grande compact.

Now, Senator Daniel, when he spoke this morning, was anxious to know about the Rio Grande compact. I did not want to commit myself, because I could not remember exactly what reference there had been in Mr. Erickson's proposal to the Rio Grande compact, but I did express myself as being very happy, as an individual at least, to see

that this legislation was so protected that we could be sure that any operations thereunder would be within the Rio Grande compact and in conformity to it. With that language in front of you, would you think that we would take care of the objections that have been raised on the operation of the compact?

Mr. GREGG. Senator, with reference to the February letter which you referred to there, I think that that was a proposal to insert certain language in the bill, and that matter was carefully considered by the board of directors of our district and was rejected as being unsuitable.

With reference to the proposed new language which you have just read, I think that is rather a large order, to make a commitment on at the present time, but, as was the case in February, we shall be very glad to give it consideration and bring it before the board of directors of the district and give you an answer on the subject as promptly as possible.

Senator ANDERSON. Of course, it is the February letter with the exception of two lines.

Mr. GREGG. I beg your pardon, but I don't recognize it as such.

Senator ANDERSON. It is the exact language, unless my office made a mistake in typing it, with the exception of the original suggestion by Mr. Erickson, which I admit was binding on no one and was merely presented so that we could see if there would be any way in the world to get agreement on it. That letter from Mr. Erickson contained also these words:

The provision for future power is in no way prejudiced by this exclusion but must be made a feature for separate authorization.

And I have never seen any reason to add those words, because all they were trying to do was make sure that if the Government of the United States needed power for its atomic energy installations, it could bring the water over the mountain and use it for that security purpose. And I have the feeling that if the Government of the United States needs power for its protection and defense and for security purposes, it will be possible to provide for that whether we have that provision for it in this compact or not. So I have eliminated that language, and I now ask you if the language which you had in February, and which you say was considered by your group of farmers, offers any possibility of solution of the difficulty.

Mr. GREGG. The February language?

Senator ANDERSON. This is exactly the February language, without the reservation for future use of power by the Government.

Mr. GREGG. I will have to admit, Senator, that this is the first time that I have seen this particular language. My recollection is that the language offered in February was considerably different from this, but I am not able to quote it verbatim.

Senator ANDERSON. I just want to say to you, Mr. Gregg, that you and I have known each other for a long time, and I know you know I would not distort that language for anything in the world. I will put Mr. Erickson under oath, if necessary, to satisfy you that that is the language of the February letter. That is precisely the language that was being considered, and your organization passed on it. Now you say that your organization passed on it unfavorably and you have

never seen the language before. I can't understand how you could pass on it without knowing what was in it.

Mr. GREGG. If that is the language that was submitted to the board, the board rejected it as unsatisfactory.

Senator ANDERSON. Can you give us any indication of what was unsatisfactory about it? I mean, it is an offer to make sure that the dam will not in any way involve the flow of the Chama River except to use the Chama, as the chairman said, as a medium for moving this water down where it may be used for domestic purposes, and where perhaps some of it could finally get down to the Elephant Butte district, which is short of water.

What did they think was objectionable about that? Or can you express it?

Mr. GREGG. The Elephant Butte irrigation district has consistently taken the position that under present conditions along the Rio Grande they are absolutely opposed to the construction of additional storage; that the Rio Grande compact must become an effective instrument for the protection of the water supply of the district; and that necessary assurances from upstream, accompanied by the proper attitude toward the operation of the stream, must be made before the district can consent to any additional construction.

Senator ANDERSON. In other words, the opposition to this bill is based upon an endeavor to revise the arrangements of the Rio Grande Conservancy District?

Mr. GREGG. No, sir.

Senator WATKINS. You mentioned something about the change in attitude. You recognize the fact that Congress can't legislate a change of attitude for the people of New Mexico.

Senator ANDERSON. I presented this statement, and I hoped we could find some basis for a solution to this, because I feel that an attempt to bring water to people in the Rio Grande district who are short of water can't be a bad proposal. In this statement, it says:

The State of New Mexico is attempting to delay or evade enforcement of the provisions of the Rio Grande Compact.

As proof of that they pointed out that a suit was filed by Texas against New Mexico for the purpose of obtaining enforcement of various provisions of the compact, that New Mexico resisted, and that is presented as evidence. Did the master not rule in favor of New Mexico by referring to the Indians we were trying to protect?

Do you feel it is wrong to protect those Indians?

Mr. GREGG. We feel that the Indian question was brought in there for the purpose of delaying enforcement of the compact.

Senator ANDERSON. But if the master for the Supreme Court ruled that they had a property right in there, and the Supreme Court finally sustained that claim, would you still contend that?

Mr. GREGG. We would of necessity have to abide by the decision of the Supreme Court.

Senator ANDERSON. Well, the Supreme Court decision would be a finding that the State of New Mexico was right and the State of Texas was wrong. Therefore you cannot accuse the people who are right of doing what they did only for the purpose of delay.

Mr. GREGG. In that case, Senator, the Rio Grande compact would become completely and perhaps permanently ineffective, and we

would be wide open to the possibility of upstream encroachment. We would no longer have even the semblance of a compact for protection.

Senator ANDERSON. Of course, the people upstream think the compact should protect them also. I do not say rightfully, but, after all, the Indians were irrigating in certain of those areas for a long, long time before there was any settlement in that valley other than Indian. And if there are any rights conferred by prior appropriation, those Indians certainly have some rights.

Mr. GREGG. We don't deny that the Indians have rights, but we don't feel that the presence of the Indians there should be used as a subterfuge to evade the obligations of the State of New Mexico under the Rio Grande compact.

Senator ANDERSON. But the master said it was not a subterfuge. He said it was proper. I am trying to find out why you still stick to the language "delay" and the language "subterfuge" when the master has already ruled against you.

Mr. GREGG. Senator, our only protection is the Rio Grande compact. If through one technicality or another the Rio Grande compact becomes ineffective, then we are completely helpless and are wide open to upstream encroachment.

Senator ANDERSON. But if there could be brought into the stream some water that is now in the San Juan, would you not be benefited by that?

Mr. GREGG. The transportation of water into the Rio Grande minus the storage, and under strict conditions of operation, would certainly not injure us or anybody else on the Rio Grande.

Senator ANDERSON. I will have to admit it makes it difficult to try to work out a basis for providing the use of this water for the benefit of the people of the State, if there is no solution to that problem. I do not say there should be an easy solution to it. I admit it is difficult. But it struck me that this language certainly takes away none of your rights, and if it brought some additional water into the stream, it might bring you some additional advantages.

Does that not appear a possibility? I am not trying to commit you to this particular language. But do you see anything wrong with an effort to say that whatever we do will be done in compliance with the Rio Grande compact, that there will be no dams to create power, and then that there shall be an operational plan worked out for the utilization of the water, which would certainly permit those in the lower part of the valley to come into it? What I am trying to ask you is, I suppose, Mr. Gregg: If you thought there was good faith on both sides, maybe this would offer some possibility of help?

Mr. GREGG. I think that what we would like to see you do, Senator, is to have the Bureau of Reclamation make a thorough study of any revised project that you may have in mind, submit the reports to all affected interests, and go through the regular procedure, and we assure you that we will give fair and unbiased attention to any proposals that are made to us officially.

Senator ANDERSON. Actually, Mr. Gregg, that is precisely what the bill provides. Is that not true?

Mr. GREGG. No, sir, we will have to disagree with that.

Senator ANDERSON. May I read the language again :

Provided that no appropriation for or construction of the San Juan-Chama project or the Shiprock-South San Juan Indian irrigation project shall be made or begun until coordinated reports thereon shall have been submitted to the affected states pursuant to the act of December 22, 1944 and approved by the Congress.

That is exactly what you have just asked for.

Mr. GREGG. In our opinion, Senator, that is with reference to the appropriation of funds, but the authorization would actually be on the books, and we are afraid that it would be so construed as a true authorization.

Senator ANDERSON. As a complete authorization ?

Mr. GREGG. As a true authorization.

Senator ANDERSON. As a true authorization.

Mr. GREGG. Yes, sir.

Senator ANDERSON. Have you been advised that by any lawyer?

Mr. GREGG. Yes, sir, I have discussed the matter with an attorney.

Senator ANDERSON. Could you supply us with a legal opinion justifying that? Because that is not the history of this type of thing. That has been done many times, and no construction such as that you have just given has ever been placed upon it.

Mr. GREGG. That is the way it appears to us.

Senator ANDERSON. But, I mean, to appear that way, there ought to be some basis for the appearance. At no time in the history of this Republic has this type of authorization been regarded as a completely true authorization.

Now, if you say that the project is approved, as several of these projects are, and that the Secretary of Interior may certify that they are feasible, and start work, then, to be sure, you would have pretty much of a true authorization. But when you have provision for the preparation of the feasibility report, the submission of that report to the affected States, and the matter then coming back for final approval by Congress, you have nothing in the legislation except the approval of the writing of a feasibility report. The rest of it has to come back. And I cannot help but feel there has been a misapprehension on that point. Because if this language does not do it, I do not know how you can write stronger language than that. Could your attorney suggest language that would do it?

Mr. GREGG. We could refer the matter to him.

Senator ANDERSON. Has he made any suggestion along that line?

Mr. GREGG. No, sir. Because we felt that the project that was under consideration was of a type that we could not agree to, and that no changes of language should materially change the situation. We did offer some language 2 or 3 years ago when this bill was first drawn, but that was rejected by the Upper Colorado River Commission, and since then we have just dropped the matter.

Senator ANDERSON. I can only say that I still hope it may be possible for New Mexico and Texas groups to agree. I have tried to indicate that as far as I am concerned I am more than willing to see to it that every proper safeguard will be put in this. I am happy to state this for the record, time after time, so that there can be no question in the legislative history that I do not regard this as a real authorization. And I think we could question one after another of the

people who appear for the Rio Grande area, and they would state they also do not consider this as a true authorization. We hope it is a provisional authorization. We believe it is a provisional authorization. And if this language does not do it, I do not know where you can find stronger language to say that it has to come back and be submitted to the affected States and then has to be approved by the Congress. We merely want to make sure that if a feasibility report is submitted and is approved by the affected States, and is approved by the Congress, then it may still be a participating project. Because we anticipate that it will be a difficult project to construct if it is not a participating project.

Senator DANIEL. Will the Senator yield for a question?

Senator ANDERSEN. Yes. As the distinguished chairman has been saying, many of these projects standing by themselves are in extreme difficulty. If these revenue projects are denied them, the participating projects are in difficulty. I am asking nothing more for this than for some of the others. I am not going into the question you raised about the sketchiness of this report, because if I were trying to hurt the upper Colorado River Basin project, I might be able to point to some other projects where the reporting is still sketchy. We have done a great deal of this on the basis that the States ought to have a chance to use their water. I think it is too bad that New Mexico's water still continues to flow to California. That is why I didn't want a situation to develop where it looked although we would rather that New Mexico's water would go to California than to New Mexico.

I realize your position is a very difficult one. I have not sought to embarrass you by my questions. I have sought to try to say only this, that I believe there ought to be a reasonable basis for settlement of this difficulty by proper guaranties to the lower valley. As the chairman suggested, we cannot resolve or legislate a different attitude on the part of the Rio Grande commissioners, but we can try to write in language that will require the living up to the Colorado River compact as to any of this water, and require certain other things, and that is the only hope I have in mind, Mr. Gregg. I hope that you will sincerely believe that.

Senator DANIEL. I would just like to ask, as a point of information: Is this legislation necessary for a feasibility report to be made?

Senator WATKINS. You mean the way it is now?

Senator DANIEL. Yes. Is any legislation necessary for a feasibility report to be made?

Senator WATKINS. No.

Senator DANIEL. Then what do you accomplish? I should direct this to the Senator from New Mexico.

What do you accomplish by this legislation? If this is a conditional authorization or a provisional one, and that is the effect of it, as the Senator has explained, then what do you accomplish by this legislation? And I ask this as really a point of information and not in an argumentative way.

Senator WATKINS. I would like to answer from my point of view. In order to work out a coordinated, consumptive use of all the waters allocated to the upper basin States, it has been necessary to go into each State and find, if possible, where that State couldn't use its water, where there would be a possibility of putting that State's share to use

in a feasible project. They wanted to present to the Congress something completely planned, at least as far as they could go without a complete draft of all the details—a completely planned use of that water. So they had to list in there the possibilities.

As a matter of fact, it will take many years, probably, to check all of those and work out detailed programs. When they get into the actual detailed investigation in the field they may find it necessary to change the method of operation or something of that sort in order to make it feasible. But we wanted the Congress to have a look at the overall program.

Now, this is what we are asking for. It is the first coordinated program or comprehensive program for the utilization of the stream. Of course, if you wait and get all of that done the projects that are urgently needed will be held up pending studies on some projects that will not be needed for years. We have projects in Utah and other States where it may be 35 or 40 years before they come back for that final authorization and come before the Congress and say, "Now, here is what we have worked out in response to your initial expression of desire to complete this thing. We have worked this out, and here is the program for authorization to go ahead and do this. We have a feasible project for this particular stream or for this particular State."

Senator DANIEL. As I understood the answer to your last question, though, that could be done with respect to this San Juan-Chama project without any further authorization by the Congress.

Senator WATKINS. I think, in view of the situation that has arisen with this program now coming in, the Bureau of Reclamation and the Interior Department would feel that they had a fresh delegation of authority to go ahead and finish these projects, or finish the investigations.

Senator DANIEL. They do not doubt the authority, though?

Senator WATKINS. They have up to this time. But now you are coming into something that affects the whole overall program, and they feel from here on out they ought to have an authorization to finish that program.

Senator DANIEL. That is, their studies?

Senator WATKINS. That is right; their studies. Now, some of them, they can say, are definitely ready for immediate authorization. But even those, Senator, the storage projects on the main stem of the river, have to be rechecked as to economic feasibility. And even after the making out of that authorization, it is still subject to check, under the Bureau of the Budget's report to the President, the substance of that being written into this bill. This bill was sent out, of course, before we heard from the Bureau of the Budget, before we heard from the President, and before we had had a final word from the Secretary of Interior, as a matter of fact. Now, what we expect to do is to rewrite this bill so far as we can in accordance with the recommendations that have been made. On some parts of it, I am sure we are not going to agree. The Bureau of the Budget and the Secretary of Interior left out some of these projects, and for the most part we want them all in there. The Navahos have one that I think, by all means, ought to be in there. But we have a different concept in this program than we have in any program previously brought before the

Congress. They used to come in with a project for Colorado, and then maybe Utah would come in for one and Wyoming for another and New Mexico for still another, without any coordination, just a sort of helter-skelter hit-or-miss proposition. But this time they got together and did, I think, a very wonderful job in finding the use of all that water that has been allotted to that basin.

Senator ANDERSON. May I say also, in supplement to that, that you sometimes get to a point where the State is torn between projects, and actually the conflict between those two projects may never develop. For example, when the first reports were made—I think I am stating this correctly—there was the feeling that the Indian lands that were susceptible to irrigation in this project might amount to 60,000 acres. Then later it was thought it might be possible to expand that project from 60,000 acres way up to 90,000 acres. The next time I went to a meeting of the Department of Interior it was up to 122,000 acres, and subsequently I have heard figures even beyond that.

Now, obviously, if the Indians were going to take all the water, require all the water, that was one thing for the State to face. If they were, then you had to fall back on that provision that says the water belongs to the State, and you might say, for example, that the entire Navaho Reservation is not inside the State of New Mexico. Part of it is in Arizona, and New Mexico should not be using its water to provide for Arizona Indians. We don't want to get into that sort of a controversy. We want the project to be built.

When you start to make a survey of the transmountain diversion, you may find that without power features it may cost \$144 million, as was testified the other day, and that you cannot find enough places to put that water profitably, so that the diversion may not be built. If that happens, then all the arguments between the Elephant Butte district and the Rio Grande district disappear. Because the water will be used some place else. It might be that the engineers may find that the Indians cannot properly or profitably use 122,000 acres. If that happens, then the white lands in the San Juan area probably can't use it either. Then you will probably see a drive on for diversion of some of this water. And when it happens, we are going to have to reach an agreement between the Elephant Butte area and the Rio Grande area as to how that water is going to be used.

It seems to me, with the shortage of water, with the difficulties in trying to carry out the Rio Grande compact because of that shortage of water, the presence of another sixty-five or one hundred thousand acre-feet of water might be very, very useful. We can surely use it in the upper area if they can not use it in the lower area. But the purpose has been to make it available pretty largely, it seems to me, for the lower area, because irrigation is decreasing, not increasing, in the middle Rio Grande Valley.

Senator WATKINS. Senator, you have this additional factor. If you put on, say, 50,000 acre-feet of water in that upper area, and the area irrigated is all in the drainage, you have a large return, some experts estimating as high as 60 percent will return. I know in my State it is at least 50 percent on the average. That goes downstream. You cannot get that upstream, unless you started pumping. It will be available for the lower irrigators.

Senator ANDERSON. That is why we thought the project would be beneficial to all people in the State.

Senator DANIEL. Has the Senator from New Mexico offered a proposal that he would make a change in the present bill in regard to the Chama problem?

Senator ANDERSON. I was just trying to find out if this language is acceptable. Mr. Gregg says it isn't for the Elephant Butte project. I think I know the answer in advance.

Senator WATKINS. I think what we have to do is develop the facts and then probably, in executive session, argue this out.

I will say to these witnesses. You have a very able representative in Senator Daniel; and you from New Mexico have another in Senator Anderson. I am sure neither of these men is going to intentionally do any damage whatever to the people of his State. Each has done a very good job of looking after his State's interests to date, and as long as he is here I think he is going to continue to do just that. We cannot continue to argue out these legal matters. We want to get all the facts and then work matters out in executive session to bring out as nearly as possible a harmonious project. But I don't think we can afford to wait until we get everybody in agreement. We will just have to take a chance and go ahead. That has been the history over the years. If you get everybody into an agreement on a water project, I would believe the millennium was here. We have worked at it for a good many years, and no matter how wonderful it seems for everybody, always somebody can find some flaw in it. As far as I am concerned, I don't intend to let this matter rest just as we can't get everybody to see eye to eye. No progress would be made that way. That applies in other fields of human endeavor as well.

The next witness is Mr. N. B. Phillips.

Senator DANIEL. Mr. Phillips, I introduced you in absentia this morning. You have already been introduced to the committee.

STATEMENT OF N. B. PHILLIPS, EL PASO, TEX., MANAGER, EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1

Mr. PHILLIPS. Senator, I offer my apologies to you. We thought yesterday that we were going to be heard this morning, and then the time didn't fit in, and we had made an appointment to talk to a man in the Bureau of Reclamation whom we could only talk to today.

Senator DANIEL. No apology is necessary. Go right ahead.

Mr. PHILLIPS. So that is where we are.

Senator WATKINS. The introduction was very good. You may proceed.

Mr. PHILLIPS. I certainly appreciate what Mr. Daniels said for me in my absence, I am sure.

Mr. Chairman, members of the committee, the statement which I am about to make, and the opposition that I am going to voice, pertains only to the San Juan-Chama feature of S. 1555.

My name is N. B. Phillips. My address is 306 El Paso National Building, El Paso, Tex.

I am the manager of El Paso County Water Improvement District No. 1 which comprises the Texas portion of the Rio Grande Federal reclamation project and I speak for 8,900 water users in said district.

The Rio Grande Federal reclamation project receives its waters from the Rio Grande, and its vested water rights are the results of filings made by the United States in 1906 and 1908 with the territorial

engineer of New Mexico. The 1906 filing was made on 730,000 acre-feet of unappropriated waters of the Rio Grande and the 1908 filing amended the filing of 1906 to cover all of the unappropriated waters of the Rio Grande and its tributaries in New Mexico at that time. The waters appropriated are stored in the Elephant Butte and Caballo Reservoirs having a total combined capacity of approximately 2,548,000 acre-feet.

The project was completed in 1916 and actual storage began in 1915. Since that time and up to the present date all waters under the filings have been put to continuous beneficial use and the project has developed into the second most prosperous reclamation project in the United States based on crop production compared to maintenance and operation cost. It has never defaulted on any payment to the United States and its initial construction cost has been reduced from approximately \$14,000,000 to \$3,300,000.

The water users in Texas on the Rio Grande project vigorously oppose the authorization of the San Juan-Chama project for the following reasons:

1. As of this date, we have received no official information as to how the San Juan-Chama project is to be operated, or who is going to operate it, or that consideration has been given, or will be given, for the delivery of water to the Rio Grande project.

Senator ANDERSON. Would you think that the Bureau of Reclamation would not operate it?

Mr. PHILLIPS. Well, we have never been officially advised that the Reclamation Bureau would operate it.

Senator ANDERSON. Do you understand that the Bureau has any relationship to this upper Colorado River Basin project?

Mr. PHILLIPS. Yes, I do.

Senator ANDERSON. And you do not think they would operate this?

Mr. PHILLIPS. They may, and they may not. An interim report on the San Juan-Chama project, gotten out by the regional director, region 5, Bureau of Reclamation, in March 1952, was furnished to the El Paso County Water Improvement District No. 1 on December 2, 1953. This was the first official information that our district had of what was proposed by the San Juan-Chama project. We were told that this report could not be considered as a feasibility report and to date are without a feasibility report on the San Juan-Chama project.

2. The Rio Grande project receives, annually, 65 percent of its water supply from the Rio Grande in New Mexico, and 35 percent of its water supply from the Rio Grande in Colorado. According to the best information which we have, namely, the interim report, the proposed San Juan-Chama project calls for the diversion of 235,000 acre-feet annually from tributaries of the San Juan River into the Chama River in New Mexico, and for the construction of 4 power and storage dams aggregating a storage capacity of 735,000 acre-feet. The El Vado Dam already constructed and in operation on the Chama River, has a capacity of 198,200 acre-feet.

In addition to El Vado Dam and the proposed dams to be built by the San Juan-Chama project, the United States Corps of Engineers is authorized by the Flood Control Act of 1948 to construct a flood-control dam on the Chama River near Chamita, N. Mex., with a reservoir capacity of 730,000 acre-feet. The Chama River is the largest tributary of the Rio Grande in New Mexico. It is the source

of a substantial amount of the water supply for the Rio Grande project. It is our opinion that the authorization and construction of the San Juan-Chama project with ample storage facilities on the Chama River to store not only the estimated 235,000 acre-feet of San Juan River water, but with additional storage capacity in the dams mentioned above to store 1,428,200 acre-feet of flood and natural-flow waters of the Chama River, would only result in complete loss to us of the flow of the Chama.

3. In the interim report of March 1952, it was recommended that exchanges of water on the upper reaches of the Rio Grande above the confluence of the Chama and the Rio Grande would be made whereby water would be delivered into the Canadian River Basin to be repaid at a later date by the San Juan waters. We feel we would be entitled to a definite formula to cover these exchanges, which would assure our protection against loss of water.

4. During the years 1951, 1953, and 1954 the Rio Grande project has been forced to operate on a far below normal water supply caused in a large degree by a continuous drought on the Rio Grande watershed during the last 12 consecutive years. The allotment in 1954 of 6 inches for each acre of water-right lands has been set up for the entire year. The normal requirement of water to produce crops is an average of 3.1 acre-feet per acre to water-right lands. In 1952 the Rio Grande project started the irrigation season with an allotment of 2½ inches to each acre of water-right lands, but the runoff during 1952 was sufficient to increase this allotment during the year to a total of 2.5 acre-feet per acre.

We, of course, cannot hold anyone responsible for drought, but we do feel that any project contemplated on the watershed of the Rio Grande should not be authorized until the downstream users have been given an opportunity to study feasibility reports and methods of operation. The State of New Mexico should have the waters she is entitled to under the Colorado River compact, but we feel we are entitled to know what effect the San Juan-Chama project will have on our water supply.

5. Testimony offered before this committee Tuesday, June 29, indicates consideration is being given to a project without power, with one regulatory reservoir at the head of the Rio Chama. We have no official information regarding the change of plans; however, when diverted waters from the San Juan are released into the Rio Chama suggested methods of operation will have to be given serious consideration by our district. Mr. Mutz, in his testimony, says it will take about 2 years to complete a feasibility report on this type of project.

6. We do not feel any project should be authorized by the Congress, conditionally or otherwise, until comprehensive feasibility reports have been made and all affected interests given the opportunity to study and analyze them.

We respectfully submit our objections to the San Juan-Chama project, and ask that authorization be withheld by the Congress until such time as a feasibility report, including the proposed method of operation and the agency designed to operate the project, has been submitted to the State of Texas for consideration.

Senator WATKINS. Are there any questions?

Senator ANDERSON. I would like to ask Mr. Phillips the question I asked Mr. Gregg with reference to an amendment which might seek to clarify this.

Am I correct in assuming that you would still be opposed to it even if that language were added to the bill?

Mr. PHILLIPS. Yes, sir; we would.

Senator ANDERSON. And under 6, may I conclude that no matter what they did in the way of writing language into the bill, this language or any other, no matter how much was written into it, you would still oppose conditional authorization?

Mr. PHILLIPS. No, I wouldn't say that.

Senator ANDERSON. I am trying to see if there is any basis for us to agree. Because you say:

We do not feel any project should be authorized by the Congress, conditionally or otherwise, until comprehensive feasibility reports have been made * * *.

You also added that Mr. Mutz had said we could not get this ready for 2 years, and since a feasibility report couldn't be ready for 2 years, you would oppose the completion of the San Juan no matter what we put in the bill.

Mr. PHILLIPS. Yes, Senator, we feel the situation is of a very serious nature. The Texas portion of the Rio Grande project must use every safeguard we possibly can to be sure that we receive our water supply. I am of the firm opinion that if the feasibility reports, including the method of operation, and the agency that is going to operate, were before us, there is a possibility that we could agree to an authorization.

Senator ANDERSON. Well, if a complete feasibility report can't be before you, the bill certainly isn't going to be held up 2 years to give you that look at it. So I say this knowing that you would be opposed to the bill.

Mr. PHILLIPS. Yes, sir.

Senator ANDERSON. Knowing that that water is going to run down to the State of California?

Mr. PHILLIPS. Well, is it going to go to the State of California?

Senator ANDERSON. It can't help it. If New Mexico can't utilize its water, there is only one place it can go.

Mr. PHILLIPS. But is there a limited time in which New Mexico has to use its water?

Senator ANDERSON. I think so. I think if New Mexico does not get into this now, we will have a long, long time before the New Mexico projects are authorized. The very fact that all New Mexico projects were removed in the House from the bill indicates that the desire is there to remove the New Mexico projects.

Now, it became easier in the House, because people could say, "There is division on this. Texas is in testifying against the New Mexico projects. Leave them out of the bill." And theoretically at least, because no feasibility report can be required, we would have this over the next 2 years or 5 years or 10 years, and therefore there would be opposition steadily on the part of Texas to New Mexico's projects, and California would succeed in getting the water. But there are farmers in the lower valley that would like to have some of that water, I really believe. I can't help but believe that there are farmers who are inside of your own project who would be safer if a supply of water was flowing down from Elephant Butte Dam.

Nobody wants to keep a distribution of that water from going from the Elephant Butte project, no one that I know anything about, in the State of New Mexico, who has been testifying in behalf of this bill. I certainly do not want to keep it from going there. But by saying that you will never pass it as a conditional project, you actually say, "We prefer to have the water go to California rather than to New Mexico."

Mr. PHILLIPS. Well, Senator, that, of course, is a statement that you make. I am certainly not saying to this committee or anybody else that I want to see California or any other State get New Mexico's water.

Senator ANDERSON. You have lived a long time in New Mexico and you have lived a very useful life in New Mexico. Your heart must be still very closely tied to all those farmers in that State.

Mr. PHILLIPS. Yes, sir.

Senator ANDERSON. And all I am trying to say is that I hope there is some basis upon which we can resolve the difficulties between the two ends of that river. Because there is no desire on my part to bring about something by the adoption of the San Juan diversion that is going to hurt the farmer below Elephant Butte Dam, but on the contrary there is every desire to help the people below Elephant Butte Dam, and if both people are trying to help they ought to be able to work out some basis by which they can help.

Senator WATKINS. If that is all, we thank you for your testimony, and we will excuse you and call the next witness.

Mr. Rollins? Mr. Rollins is a member of the Texas Board of Water Engineers.

Senator DANIEL. He was here this morning.

Senator WATKINS. Oh, he was introduced. So we are now acquainted.

STATEMENT OF A. P. ROLLINS, MEMBER, BOARD OF WATER ENGINEERS OF TEXAS

Mr. ROLLINS. Mr. Chairman and members of the committee, I am A. P. Collins, Austin, Tex., member of Board of Water Engineers of Texas.

The Board of Water Engineers of Texas, operating under authority of State laws, is responsible for the allocation of State waters and for the issuing of permits to appropriate and beneficially use those waters.

As a member of the Board of Water Engineers of Texas, I am filing this statement in protest of the authorization of the San Juan-Chama project contained in Senate bill No. 1555.

Texas has certain rights to waters from the Rio Grande and those rights were recognized in the negotiation of the Rio Grande compact between Colorado, New Mexico, and Texas. That compact was ratified by the three States and approved by the Congress of the United States.

Under the provisions of the compact, Texas is entitled to water from the Elephant Butte and Caballo Reservoirs in which the flow of the Rio Grande is stored. El Paso County Water Improvement District No. 1, with approximately 70,000 acres of irrigable land, is a partici-

part in and a beneficiary under the Rio Grande project. Hudspeth County with approximately 20,000 acres of irrigable land also receives water from the Rio Grande project. The city of El Paso, the sixth in size in Texas, with a population of approximately 150,000, because of its ownership of water rights land, is dependent on the Rio Grande for a supplemental water supply.

The Elephant Butte and Caballo Reservoirs impound the entire flow of the Rio Grande. The Rio Chama is the largest contributing tributary of the Rio Grande in New Mexico.

Water was first stored in the Elephant Butte Reservoir in 1915. Since that time, the reservoir has overflowed or spilled one time. The reservoir spill occurred in 1942. The record of only one spill in 39 years indicates that the Elephant Butte Reservoir is adequate to store the flow of the Rio Grande and that additional storage is not needed.

The record also indicates that since storage began in January 1915 the quantity of water in storage has been less than 400,000 acre-feet for 58 months, or 4 years and 10 months. And that storage has been below 400,000 acre-feet since June 1950.

The total storage in the Elephant Butte and Caballo Reservoirs on June 21, 1954, amounted to 98,200 acre-feet, which is only 8.4 percent of the average storage for the same date since 1915 of 1,171,900 acre-feet.

Senator WATKINS. May I ask a question at that point?

Mr. ROLLINS. Yes, sir.

Senator WATKINS. Is this area a part of the flood area on the Rio Grande?

Mr. ROLLINS. No, sir. It went up the Pecos almost to the New Mexico line but did not get into New Mexico.

Senator ANDERSON. We don't understand how you Texans can stop it that way.

Mr. ROLLINS. We didn't stop it, sir.

Senator ANDERSON. You have to admit that somebody was regulating that rainfall to drop most of it on Texas.

Mr. ROLLINS. Senator, if we had power to, I assure you we would have stopped it a little before it did stop. We had a report on Monday noon that the flow at Del Rio was 1 million cubic feet per second. That report came to us from the International Boundary and Water Commission.

Senator WATKINS. If you could just have had that regularly, it was all right.

Mr. ROLLINS. Or if we could have moved it upstream.

Senator DANIEL. Up above Elephant Butte?

Mr. ROLLINS. Yes, indeed.

It is evident that the capacities of the two reservoirs are not in excess of the requirements of the Rio Grande project. The past winter runoff was only 25 percent of normal and spring flow has been abnormally low.

Since the Elephant Butte Reservoir is adequate to store the total runoff of the Rio Grande, there having been but one spill during the 39 years water has been stored in it, additional storage is not needed to conserve water for irrigation.

The present situation, if you please, is 160,000 acres of irrigable land under the Rio Grande project, a total of 98,200 acre-feet of water in project storage on June 21, 1954, and an accumulated deficit of over 400,000 acre-feet in the quantities allotted under the compact.

It is evident, therefore, that additional upstream storage for the fullest practicable utilization of the flow of the Rio Chama and its tributaries for the development of hydroelectric power, as was outlined in the interim report that has been mentioned, in conjunction with the flows diverted from the west slope would further diminish the already limited water supply for the Rio Grande project.

Speaking for the Board of Water Engineers of Texas, I respectfully request that this committee do not authorize the San Juan-Chama project until it has been determined that the construction and operation of the proposed project will not further deplete Rio Grande project storage and will not conflict with or further complicate the administration of the Rio Grande compact.

Senator WATKINS. Will you tell us how that could happen? I am interested.

Mr. ROLLINS. The interim report says they are going to set up 753,000 acre-feet of additional storage, in which they are going to store 235,000 acre-feet. We assume certainly that they will store any other water that falls above those reservoirs, in them. Otherwise they would not have built this additional capacity; that is, they would not have recommended the additional capacity.

Senator WATKINS. That sounds a little bit unreasonable.

I have known the reclamation people for a long time, and I have not known of their getting far off.

Mr. ROLLINS. That is on page 20 of the report, sir; under the interim report prepared by the Bureau of Reclamation, which I am sure the gentlemen have seen.

Senator WATKINS. And what region is that?

Mr. ROLLINS. That is region 5, the interim report on the San Juan-Chama project.

Senator WATKINS. And the regional headquarters are in Texas, as I remember.

Mr. ROLLINS. Amarillo; yes, sir.

Senator WATKINS. All right.

Mr. ROLLINS. It was proposed to construct Heron No. 3, with 228,000 acre-feet, Heron No. 4 with 400,000 acre-feet of storage, Pozo with 40,000 acre-feet, and regulation capacity on the Rio Chama was 85,000; and in addition to that they will have the existing El Vado Reservoir of 198,200.

Senator WATKINS. Where did they say they were going to get the water from to store that?

Mr. ROLLINS. That is the thing that is concerning the people of the lower Rio Grande, sir.

Senator WATKINS. You mean they haven't any means to get the water to put in there?

Mr. ROLLINS. They propose to divert 235,000 acre-feet from the San Juan. The dams will be in the Rio Chama, and the Rio Chama is the principal tributary of the Rio Grande in New Mexico.

Senator WATKINS. What is the average flow of the Rio Chama above the points where they propose to store?

Mr. ROLLINS. I don't have those figures. As I remember, it is something like about 165,000 acre-feet per annum.

Senator WATKINS. They were not storing the Rio Chama for consumptive use, were they?

Mr. ROLLINS. They propose to utilize it to the fullest capacity. This expression is in the report :

The project plan is based upon fullest practicable utilization of the flows of Rio Chama and its tributaries for development of hydroelectric power in conjunction with flows diverted from the west slope.

That is a quotation from the first paragraph on page 17 of the report.

Senator WATKINS. That indicates that the storage is not for a consumptive use, is it ?

Mr. ROLLINS. No; it is to be impounded and held up for power development, sir.

Senator WATKINS. I want to get your point of view, because it is important for us to know. It is your point of view that the mere storage of that water for a nonconsumptive use would seriously deplete your supply ?

Mr. ROLLINS. In the Elephant Butte Reservoir, yes, sir, because it will only be released in a quantity sufficient to develop their power load, and not for the purpose of conveying it into the Elephant Butte Reservoir.

Senator WATKINS. Well, now, where is the greater evaporation likely to take place, in the Elephane Butte or up in the upper storage? You lose a lot of water in Elephant Butte, do you not, by evaporation ?

Mr. ROLLINS. Yes, sir. That is the unfortunate thing about our reservoirs.

Senator WATKINS. Suppose they store at a higher elevation? And it must be at a higher elevation, from what you have said. You are not as likely to have as much evaporation up there as you would lower down.

Mr. ROLLINS. I don't suppose there would be as much evaporation, but there would be considerable stream loss flowing from there down at a normal rate.

Senator WATKINS. They would have a fairly good rate if they had to release it for irrigation below.

Mr. ROLLINS. Yes, sir; there is storage capacity in the Elephant Butte Reservoir, and the Elephant Butte project was filed on the waters of New Mexico. I am sure that if the engineers of the Elephant Butte project had felt it was better to store the water up there, they probably would have stored it.

Senator WATKINS. Probably so, unless the board of directors told them the opposite.

Mr. ROLLINS. The Bureau of Reclamation built the project, sir.

Senator WATKINS. I understand that.

Senator ANDERSON. Did they ?

Mr. ROLLINS. The Elephant Butte project.

Senator ANDERSON. Oh, yes.

Senator WATKINS. What I am trying to get at is the practical effect, whether you actually lose more water by the upstream storage than what you would lose at Elephant Butte. Unless the reservoirs upstream were much more shallow, you probably wouldn't lose as much. And I would assume that they would have to release the water as you needed it downstream to irrigate. It would run right through your reservoir and out where you wanted to use it.

Mr. ROLLINS. With the expression that they use, sir, that the project plan is based on the fullest practicable utilization of the flows of the Rio Chama and its tributaries for the development of hydroelectric power—

Senator WATKINS. Well, that sounds like they would use it for that as much as they could, consistent, of course, with the irrigation uses which would have the priority. But if a nonconsumptive use is possible without interfering with either the quantity or the quality of the water for a consumptive use, ordinarily it is good business, it is good sense, it is good economics, and it is good neighborliness to let it be so used.

Mr. ROLLINS. Has the Senator undertaken to get water released that is being held up to develop power to meet an obligation for the purpose for which it is to be used for irrigation downstream?

Senator WATKINS. Yes, we have got to do that on the Colorado River. We have got to release it, as the compact calls for, to meet the needs of the people of the lower basin States. That is what we assume on the Colorado. That is the law of the river. That is what we have to do. And I don't see why it couldn't work on your river.

I am not trying to force you to do it, but I am trying to get the information.

Mr. ROLLINS. Surely. And that is what we want determined, sir.

Senator WATKINS. I would think in the interest of good neighborliness, you would be willing to do everything you could. I think some time it would be well if you folks could get over your suspicion of each other.

Someone said they wanted to get the attitude of the New Mexico people changed. I remarked that we can't get that done by legislation. And I am not finding them guilty, because I am assuming that New Mexico probably entered a denial, and the case hasn't been tried, so nobody knows yet whether either one is guilty.

Mr. ROLLINS. In conclusion, sir, speaking for the Board of Water Engineers of Texas, I respectfully request that this committee not authorize the San Juan-Chama project until it has been determined that the construction and operation of the proposed project will not further deplete Rio Grande project storage and will not conflict with or further complicate the administration of the Rio Grande compact.

Senator WATKINS. I assume from the language of the bill as now drawn, that is exactly what was contemplated. The very thing you are asking for, I think, was intended in that bill.

Mr. ROLLINS. I think, sir, if you would put in there that the authorization of the project should be deferred until it has been determined that the construction and operation of the project will not further deplete the Rio Grande project storage or will not conflict with or further complicate the administration of the Rio Grande compact, we would have no objection.

Senator WATKINS. As to complication, I don't know about that.

Senator ANDERSON. I think you are coming along. That is the most encouraging admission we have had all day, and I appreciate it. As a matter of fact, you have worried about the upstream storage if there was going to be the development of hydroelectric power. Actually, Mr. Rollins, if we put on an amendment that would stop

the construction of these hydroelectric dams, that would remove that much of your objection, wouldn't it?

Mr. ROLLINS. Yes.

Senator ANDERSON. That is fine.

Mr. ROLLINS. I would say, sir, that if you will say that the final authorization of this project will be deferred until it has been determined that its construction and operation will not further deplete the Rio Grande project and will not conflict with or further complicate the administration of the Rio Grande compact, we would have no objection, sir.

Senator WATKINS. We might not put it in exactly that language.

Mr. ROLLINS. I don't know how you can make it clearer. That states our position, sir.

Senator ANDERSON. I do think if this committee can take care of your objections, it would be very desirable to do so. That is why this language over here that says it shall be in full conformity with the Rio Grande compact is just exactly what you want, I think.

Mr. ROLLINS. If you will put in there the part about the final authorization of the project.

Senator ANDERSON. You can depend upon your Senate and House delegation to see to it that no legislation passes without what you have said. Anybody who hasn't found out the power of the Texas delegation in Congress hasn't been around here very long.

Mr. ROLLINS. We are very proud of them, sir.

Senator WATKINS. You have a right to be.

Mr. Scott?

Senator DANIEL. Mr. Scott is the Rio Grande compact commissioner for the State of Texas.

STATEMENT OF LOUIS A. SCOTT, EL PASO, TEX., RIO GRANDE COMPACT COMMISSIONER FOR TEXAS

Mr. SCOTT. Mr. Chairman and members of the committee, my name is Louis A. Scott. My address is 1100 First National Building, El Paso, Tex., and I am Rio Grande compact commissioner for the State of Texas.

The Rio Grande compact between the States of Colorado, New Mexico, and Texas allocates the waters of the Rio Grande from its sources in Colorado to Fort Quitman, Tex., between the signatory States, and makes provision for the annual delivery to Mexico, under the convention of 1906 between the United States and Mexico, of 60,000 acre-feet of water from water stored in Elephant Butte Reservoir.

We wish to make clear that the only portion of S. 1555 to which the State of Texas objects is the inclusion of the San Juan-Chama transmountain diversion as a participating project.

Under the Rio Grande compact, the commissioner for New Mexico represents all interests above Elephant Butte Reservoir in that State, while the commissioner for Texas represents all interests below the reservoir. The area so represented by the Texas commissioner includes the entire Rio Grande Federal reclamation project comprising approximately 160,000 irrigable acres, 90,000 acres lying in New Mexico and 70,000 being in El Paso County, Tex.

This project has been in operation since 1915 and is rated by the Bureau of Reclamation as one of the three most successful Federal projects. Its cost of construction, operation, and maintenance is being paid by the landowners, without subsidy, and they have never defaulted in making any payment when due.

The Rio Chama is the principal tributary of the Rio Grande in New Mexico. At least 50 percent of the water that flows into Elephant Butte Reservoir for use on Rio Grande Federal project lands, and for making delivery to Mexico under the convention of 1906, comes from the Rio Chama. It is therefore of utmost importance that nothing be done to withhold or diminish the normal flow of this river.

Senator ANDERSON. Does that mean that the Rio Chama contributes half of the flow to the Rio Grande? It doesn't, you know.

Mr. SCOTT. No, approximately one-half of the water that gets into Elephant Butte Reservoir, Senator, comes from the Chama.

Senator ANDERSON. Can you identify which water comes from the Colorado and which comes from the Chama and which comes from the Pecos?

Mr. SCOTT. I think perhaps the records of the United States Geological Survey would show the volume that flows from each of those streams.

Senator ANDERSON. That wouldn't be half from the Chama, would it?

Senator DANIEL. I thought it was nearer two-thirds.

Senator ANDERSON. It is one-third from the Chama and two-thirds from the other sources, is it not?

Mr. SCOTT. I have been informed that at least half of the water that reaches Elephant Butte comes from the Chama.

Senator ANDERSON. Just for my own information: Mr. Erickson, what is the situation?

Mr. ERICKSON (John R. Erickson, State engineer of New Mexico). The flow of the Chama is about one-third of the total flow at Otowi.

Senator ANDERSON. So if it isn't one-third at Otowi, and additional water comes in below that is not from the Chama, it couldn't by any stretch of the imagination be more than a third, and it probably is less; isn't that right?

Mr. SCOTT. That is not my information, sir.

Senator ANDERSON. Would you give us the source of your information? That would be interesting.

Mr. SCOTT. Well, I have been told that by engineers, and if I remember correctly, I think I got approximately the same information out of the Bureau office in El Paso, but I could be mistaken about that. I didn't just reach out into the air and get it myself. I am no water engineer.

It is intended by the Rio Grande compact that there shall be a normal release of 790,000 acre-feet per year from Elephant Butte Reservoir for use on lands under the Rio Grande Federal project and to meet the treaty requirement of 60,000 acre-feet in Mexico. Experience has proven that a minimum of 3 acre-feet of water is needed to grow cotton, while more is required for alfalfa, other feed crops, and vegetables. Because of the critically low supply of water in storage up to June 21, 1954, only 6 inches has been allotted to first-class water-right lands.

Article VII of the compact provides that New Mexico shall not increase storage in reservoirs constructed after 1929 when there is less than 400,000 acre-feet of usable water in Elephant Butte and Caballo Reservoirs. For considerable periods from 1950 to 1954 there has been less than this amount of water in these reservoirs. On June 21, 1954 the water in both amounted to only 98,200 acre-feet, which was 8.4 percent of the average for the past 38 years.

The third paragraph of article VI of the compact provides that New Mexico shall not accrue debits in excess of 200,000 acre-feet, except as such debits may be caused by storage of water held in reservoirs constructed after 1929, and that New Mexico shall retain water in storage at all times to the extent of its accrued debit. El Vado Reservoir on the Rio Chama is at present the only reservoir on this river constructed after 1929, so this provision of article VI means that New Mexico shall retain in El Vado the amount of its accrued debt to Texas. The capacity of El Vado Reservoir is about 198,000 acre-feet. From January 1, 1942, to December 31, 1953, New Mexico accrued a debit to Texas of almost 479,000 acre-feet. In other words, on December 31, 1953, New Mexico owed Texas that amount of water. This enormous debt, which is more than twice the maximum permitted New Mexico by the compact, has been accumulated with only one dam on the Rio Chama. While we do not intend to imply that all of New Mexico's debit has been caused by refusal to operate El Vado Reservoir in compliance with the Rio Grande compact, we do say that a very substantial part of it is directly attributable to such dereliction by New Mexico.

Under article VII of the compact no water should have been stored in El Vado Reservoir at any time since January 1, 1954, but in order to prevent damage to the valves in the dam that might be caused by trash and debris becoming lodged in the valves when the reservoir is drained, an agreement was made several months ago that during the year 1954 not to exceed 3,500 acre-feet of water could be stored so as to keep trash and debris floated above the valves. However, on May 31, 1954, the last date on which official information was compiled by the United States Geological Survey, New Mexico had stored 51,100 acre-feet in El Vado, or 47,600 acre-feet more than was authorized under the agreement.

Although New Mexico has failed and refused to operate El Vado Reservoir in compliance with the Rio Grande compact, she is now urging enactment of legislation by the Congress which will authorize the construction of one or more additional reservoirs on the Rio Chama, having combined storage capacity many times that of El Vado.

Senator ANDERSON. Can you point to that specific spot? Can you point to the language where we are urging that you do that?

Mr. SCOTT. The only thing that has been submitted to us is the interim report by the Bureau of Reclamation, which has been referred to here, and which provides for the construction of the reservoir mentioned by Mr. Rollins a few moments ago.

Senator ANDERSON. Mr. Scott, did you write a letter to Mr. Erickson under date of March 12, 1954?

Mr. SCOTT. Yes, sir.

Senator ANDERSON. Did you, in that letter, comment on the possibility of constructing this project without power dams?

Mr. SCOTT. Senator, let me refresh my memory on what is in the letter. That is March 12, 1954? I remember having correspondence with Mr. Erickson.

Senator ANDERSON. Did Mr. Erickson submit to you an amendment which he was submitting in a tentative and sort of friendly fashion, which will be discussed with Mr. Mutz and others, which proposed a project that didn't involve a power dam on the Chama or a dam of any kind on the Chama?

Mr. SCOTT. No, sir.

Senator ANDERSON. What did he suggest? The dam was to be on Willow Creek, was it not?

Mr. SCOTT. The one letter I had from Mr. Erickson on that subject was a letter dated February 23, 1954, in which he set out the language of what you might call a proposed amendment, I suppose. However, while it did provide, while that language did provide that the project would be limited to a project for water use only, exclusive of power, there was a proviso within the suggested amendment that provision for future power is in no way prejudiced by this exclusion but must be made a feature of a separate authorization.

Senator ANDERSON. Based on the fact that the Federal Government has several billion dollars invested in atomic energy and that its main laboratory is at Los Alamos, N. Mex., and the Federal Government, in the interest of national security, might some day have to speed up activity and might want to develop its own power up there. Nobody wanted to forbid that; but I have suggested leaving that out, because everyone understood exactly what that provision was in there for, I thought. But, regardless of that, wouldn't it involve storage reservoirs having capacities many times that of El Vado?

Mr. SCOTT. The only thing we have ever had submitted to us is the interim report by the Bureau of Reclamation. It was only after we got to Washington yesterday that we learned that a proposal had been made, before this committee possibly, for the construction of one dam.

Senator ANDERSON. Your letter, then, in March, commenting on that was written in the absence of knowledge that any such proposal was being considered? You yourself, commented on it, and you yourself said—

This qualifying language contained in your letter as a suggested amendment to H. R. 4449 does not meet with the approval of either district. It is my personal opinion that the language does not go far enough, but in view of the seemingly unalterable opposition of all interested parties to authorization of the project, prior to a feasibility report establishing economic justification, I see no point in trying to agree on amendatory provisions to be inserted in the bill.

Mr. SCOTT. That was what was said in the letter.

Senator ANDERSON. Wasn't that letter written with regard to a proposal to eliminate the power dams?

Mr. SCOTT. It was written in response to Mr. Erickson's letter of February 23.

Senator ANDERSON. And did that not contain a proposal to eliminate the power dams?

Mr. SCOTT. Not unqualifiedly, no, sir. At least I didn't so construe it.

Senator DANIEL. Did you know that the member of this committee from New Mexico might be planning to amend the bill that you had before you?

Mr. SCOTT. Not until yesterday, Senator Daniel. That is correct. Senator DANIEL. I want to say that that is certainly true as far as the Senator from Texas is concerned. I did not hear of the rumor until yesterday, or know of it definitely until today.

Mr. SCOTT. Senator Anderson, on March 18, 1954, Mr. Erickson wrote me this letter, in reply to my letter of March 12:

Thank you for your letter of March 12, setting forth the situation in regard to the San Juan-Chama project. It definitely appears that further action is out of the question at this time.

I thought that closed the book for a while anyway.

Senator ANDERSON. As far as agreement between the two groups was concerned. As I understood Mr. Erickson's point of view, he was trying as hard as anyone could try to bring about a peaceful settlement of this just as I am trying to do. I am very, very anxious to see if we can't resolve this. I think the presence of San Juan River water in the Rio Grande, if it is found to be feasible and if it doesn't jeopardize other rights in that part of the world, would be a very useful thing not only to the city of Albuquerque and various other municipalities in New Mexico, but would be a very useful thing to those farmers below the Elephant Butte Dam, who are now seriously short of water.

I just hope that, instead of saying, as was said here, that they were unalterably opposed to the project, we might say on the basis of previous presentations, we are unalterably opposed to it but if there is any possibility of finding a reasonable solution we are happy to come to it, as Mr. Rollins was. I think his attitude was fine. He had his mind well made up when he came in here, but if there was any possibility of working out a solution he seemed to be agreeable, which I enjoyed very much, because I would like to see a solution worked out.

I have said, Mr. Scott, as frankly as I could, that I could understand the worries of the people in the lower valley. And knowing those worries exist, I think it is highly improper for us to try to put through a project carrying along these power dams, unless we could find some formula that would satisfy them. We have not been able to come up with that formula, and therefore I have been in favor of eliminating the power dams from consideration. I don't know how much further a person can go.

Senator WATKINS. Mr. Scott, judging by the statements of the witnesses from Texas and New Mexico opposed to this particular project, you are very short of water in that lower basin area.

Mr. SCOTT. Oh, yes; critically so.

Senator WATKINS. And have you ever given consideration to the fact that if you get the San Juan water over there, some of it might be available to you people?

Mr. SCOTT. Well, Senator, I am no engineer, but I have heard the opinion expressed that so little if any of that San Juan water would ever get down to Elephant Butte that it would really make no difference.

Senator WATKINS. How far is it from the upper reaches of the Chama down to the Elephant Butte?

Mr. SCOTT. Oh, better than 300 miles.

Senator WATKINS. Of course, when you put water in a watershed, unless it evaporates or is used consumptively, it is used somewhere, and it usually goes downhill.

Senator ANDERSON. Right on that point, Mr. Chairman, the New Mexico congressional delegation, Senator Chavez, Congressmen Dempsey and Fernandez, and I, has been doing everything it can do to bring about what is needed above Elephant Butte Dam. We are happy to do everything we can do to try to get as much water as we can down into that area.

Senator WATKINS. If they bring over 150,000 acre-feet of water they will lose some from evaporation, but they ought to have a return flow of at least 75,000 acre-feet that will go somewhere down that stream. Whether it is used up by intervening appropriators or plants that might be in the river that they haven't cleaned out yet, I do not know. But I have had the general theory that it is always a good thing to bring additional water into a basin where they are short of water. There is the possibility, even if you don't get it by return flow, that you may be able to purchase some of it. I don't see why, if you are as short of water as you claim to be, some couldn't be brought down there as a supplemental supply.

Mr. SCOTT. Senator, Texas doesn't object to the bringing of the San Juan water over into the Chama basin. What Texas is protesting is the storage, in excess of what is brought over.

Senator WATKINS. Now, suppose they bring it over, and the only thing they use the Chama for is to carry it a part of the way from where it comes into the Chama drainage area down to the point where they convert it to storage in this little creek storage.

Now, what objection could you people have to the use of that river bed to carry some of that water?

Mr. SCOTT. We don't, if it doesn't interfere with the normal flow of the Chama that would otherwise pass on down to Elephant Butte.

Senator WATKINS. If I remember, you have a lot of riverbeds, and once water goes down over those dry beds in shallow streams a lot of it goes up in evaporation into the sky. You would have an increased flow to take care of that. So I can't see any damage that could come to you. I know many of you and I am sure you are not the kind of people that would refuse to do it just because it might help someone else.

Mr. SCOTT. Oh, no.

Senator WATKINS. So it seems to me if the bill is amended to take care of that situation there ought not to be any objection on the part of the Texas people and the lower New Mexico people. And it would be a shame to try to hold up a big project like this, because of the objections that have been raised here, if they can be met by an amendment such as has been suggested. If that amendment was adopted, you would withdraw your objections, would you not? If an amendment of that kind were adopted?

Mr. SCOTT. Senator, the choice isn't solely with me, either individually or as compact commissioner for Texas. The wishes and the desires of the people in the Rio Grande project must be considered and respected, so far as I am concerned.

Senator WATKINS. And you realize that with this setup the way it is, and with the stage of the investigations that have been made on the Chama project, it will be at least 2 years before we could get back to Congress asking Congress to authorize a project of that kind? In

those 2 years you wouldn't be losing your protection if the authorization has to come back to Congress again before they can get any money for it.

Mr. SCOTT. Well, I can't entirely agree with that view.

It seems to me that the economic soundness and justification of a project should be established before construction is authorized.

Senator WATKINS. Well, this isn't a construction authorization. We can write in language to make it clear that it is not an authorization for construction.

Mr. SCOTT. Senator, we have never had any amended bill submitted to us. We are considering what is before this committee, what has been introduced.

Senator WATKINS. We realize that. And, as I stated: "If this amendment is adopted." It seems to me you are evading the question when you take that attitude.

Mr. SCOTT. Well, I don't think that we should be asked to absolutely and finally commit ourselves until we see the exact wording of any proposed amendment.

Senator WATKINS. All right. Wait until it comes up again for authorization, and then you can come in and urge every objection you have now and all you can think of in the intervening period. This committee doesn't want to injure you in any way. The United States has a big investment down there. And certainly, as one who represents the Government, I don't want to see us impair any of those projects. But I don't like to see an attitude come in here that would hold up a great benefit to the people of New Mexico if they could use some of the San Juan water in that area. I know they need it, and I know you folks need it. At least, the people in New Mexico need it. And their share of the water could all be used in New Mexico, which would make more available for you lower down. That is why I say that we want to be cooperative and helpful, and we are not criticizing you, but we would like to get your attitude.

Senator DANIEL. Mr. Scott, what did you say a minute ago, that you would have no objection to storage that was limited to the amount of San Juan River water that was brought across?

Mr. SCOTT. I think what I said, Senator Daniel, was that what Texas objects to is the storage of far more water than is proposed to be brought across.

Senator DANIEL. What if this bill provided that no more storage shall be authorized or provided than would take care of the water that was brought over from the San Juan?

Mr. SCOTT. Well, let's see. I think, on the basis of the interim report, it is proposed to bring over 235,000 acre-feet per year. Now, that question has never been put to me before. I never even thought about it. But my immediate reaction to it would be that so far as I am personally concerned I would see nothing wrong with authorization for a dam limited in capacity to 235,000 acre-feet.

Senator ANDERSON. I would see nothing wrong with that kind of a limitation.

Mr. SCOTT. I am giving you my personal views and opinion. What the people under the Rio Grande project may think is something else.

Senator WATKINS. When they ask for your recommendation, it is quite important to know your position.

Had you finished?

Mr. SCOTT. No, sir. I am resuming at the top of page 5.

On page 4, I had mentioned about El Vado.

We say one or more additional dams because, from testimony offered before this committee by proponents of the San Juan-Chama project, we are unable to determine whether New Mexico seeks authorization for construction of four new dams, as outlined by Mr. John L. Mutz, area planning engineer, Bureau of Reclamation, Albuquerque, N. Mex., or only one dam without facilities for the generation of electric power.

I might digress here for a moment, gentlemen, and say that the reason that statement is in there is that, I repeat, it was only yesterday I learned for the first time that this committee was giving consideration to one dam.

Senator WATKINS. Not any dam on the Chama. We are not even considering one dam on the Chama, as I understand it.

Senator ANDERSON. May I say, there, Mr. Scott, that I can understand the fact that you haven't had any official assurances. But one of the difficulties is that the project has never been started to where we can get a feasibility report. Therefore, people can't give assurances. But I am very happy to put this in the record. I will be only one member of the Interior Subcommittee that will be working on this bill, but I would certainly ask the members of the subcommittee and the full committee to see to it that the final bill does make provision along the line that has been proposed here this afternoon so that it accords with the testimony that Mr. Mutz gave the other day and that we have been discussing right along.

Senator WATKINS. And I would say, as a member of the subcommittee, that if that is the position of New Mexico as expressed by Senator Anderson, I, for one, would be willing to go along with him on that. Because, after all, it is a New Mexico problem largely. And if they are willing to accept an amendment of that kind, I certainly would support it. I am quite sure the other members would also.

Mr. SCOTT. In connection with what I said a moment ago, I think we would want better assurance than we have ever had so far that any such dam would be operated in absolutely strict compliance with the Rio Grande compact.

Senator WATKINS. You understand, Mr. Scott, that the dam is not to be on the Chama. So what difference would it make to you how they operate it?

Mr. SCOTT. It is going to be a reservoir constructed after 1959.

Senator WATKINS. It will be off of the Chama and will be for another water shed over which you should have no control.

Mr. SCOTT. Is it proposed to construct it off the Chama?

Senator WATKINS. That is right. That is what I am trying to say. On Willow Creek, as I remember the place they told me. Entirely off-stream storage.

Mr. SCOTT. Well, I am basing this statement primarily upon this interim report, because I never heard anything different up until yesterday.

Senator WATKINS. Well, and I realize it, and I realize you are at a handicap, but we are presenting another point of view to you and trying to get your reaction to that. Because if that amendment is

adopted, what you are fighting here is outmoded. It doesn't exist any longer.

Mr. SCOTT. Well, some of it would, I think.

I want to get to one phase of it that is covered back here a little bit later on.

In either case no report has been prepared showing economic justification or feasibility, or by what agency such dam or dams will be operated, or the method of operation. No assurance has been given that the normal flow of the Rio Chama will not be impounded or curtailed. On the contrary, the plan proposed in the interim report of the Bureau of Reclamation, discussed by Mr. Mutz in his testimony, expressly provides for storing such a large part of the normal flow of the Rio Chama, in addition to imported water from the San Juan River, that absolute control of this principal tributary of the Rio Grande in New Mexico will be given to the agency operating the reservoirs.

Texas can not agree to any such plan, or to any other plan, regardless of the number of structures involved, until after being furnished with a feasibility report showing how the project is to be operated, by what agency, and that methods of operation will not reduce the supply of water for lands in the Rio Grande Federal reclamation project.

Mr. John R. Erickson, State engineer for New Mexico, and also Rio Grande compact commission for New Mexico, seems to be in agreement with the position taken by Texas and by irrigation interests in New Mexico below Elephant Butte Dam. Pages 322-323 of the stenographic transcript of proceedings before this committee on June 29, 1954, contain the following statement by Mr. Erickson:

It appears from the record that they (referring to Texas and irrigation interests below Elephant Butte Dam) are not objecting to the importation of water to the Rio Grande Basin, but to the possible impounding and control of Chama River water incidental to the power production which was outlined in an interim report on the project.

Unless there are definite operating plans and satisfactory control by an agency empowered to regulate the waters of the streams so as to fully protect their rights and interests, they have a legitimate complaint.

Mr. Mutz has testified (p. 348 of the same transcript) that about 2 years will be required to complete a feasibility report.

It is our firm belief that the San Juan-Chama project should not be authorized until it is submitted in more definite form than has thus far been proposed, and then not until its economic justification and feasibility is established after thorough, careful studies by all interested and affected parties.

We sincerely believe that the project as submitted in the interim report of the Bureau of Reclamation will jeopardize the existence of the Rio Grande Federal reclamation project. If lands under this project are deprived of the normal flow of the Rio Chama at least half of the fertile acreage that has been under cultivation for many years will revert to desert, with consequent disaster to the economy of the whole area and loss to the Federal Government of several millions of dollars still owing on the cost of the project.

For the reasons stated, we respectfully urge the committee to strike from S. 1555 the authorization for the San Juan-Chama project as a participating project.

Senator DANIEL. I agree with the witness based on what we had before yesterday. I would like to ask this. Whatever shape this bill

is passed in if this project should be left in here in modified form, do I understand it correctly that provisional authorizations such that it is not a true authorization and could not be so interpreted that actually Congress again after hearing from the report would have to give the true authorization for any expenditure of funds?

Senator WATKINS. That is my understanding.

Senator ANDERSON. That is my understanding and it so happens that Mr. Will who was a long time in the Department of the Interior and has had a good deal of experience with those things, does not consider it as anything other than a provisional authorization.

Senator DANIEL. I wanted to be sure the record was made to that effect.

Senator WATKINS. That is my understanding.

Senator ANDERSON. Because it is pertinent to what has been said, and not what General Grant is going to say I have a statement sent by landowners at Turley ditch in San Juan County, New Mexico, expressing their protest against the proposed San Juan-Chama diversion. I feel it is no more than proper that I should present their protest but I would like to say this, Mr. Chairman, that what I want to do is ask Mr. Erickson if he would take just a moment to discuss their objections. It will not take but a minute and will not conflict with what General Grant will say.

Senator WATKINS. Very well.

Senator ANDERSON. I hand you this comment by the people on the ditch and just ask you as state engineer if you agree with those statements or if you would like to make a statement of your own?

STATEMENT OF JOHN R. ERICKSON, STATE ENGINEER FOR THE STATE OF NEW MEXICO

Mr. ERICKSON. The statements are by a group of water users who irrigate land below the Navaho Dam site. They have a very special problem down there. They feel that they should raise their objections formally. It seems that they fear that the stream might be dried up at that point and they would have a sedimentation problem occurring below the dam site.

Senator WATKINS. That is if these dams are built up on the river?

Mr. ERICKSON. Yes, sir.

Senator ANDERSON. The Navaho Dam?

Mr. ERICKSON. That is on the San Juan below the Navaho site. The State has recognized this problem and has solicited the help of the Bureau of Reclamation to try to solve the difficulty for the people there but they nevertheless are stating their objection.

Senator WATKINS. It may be placed in the record.

(The statement of protests referred to follows:)

To the Chairman and Members, Senate Committee on Interior and Insular Affairs, Washington, D. C.:

GENTLEMEN: The undersigned directors or landowners under the Turley ditch in San Juan County, N. Mex., wish to make a protest against the proposed San Juan-Chama transmountain diversion project, unless prompt and adequate compensation be first provided for the inevitable loss of the homes and farms served by the Turley ditch. Turley ditch now diverts natural streamflow from the San Juan River about 10 miles below the site for the proposed Navaho Dam, from which its water supply is to be provided after the completion of that storage.

The out-of-basin diversion of such an amount of water as contemplated for the San Juan-Chama project, in addition to that to be used for the Shiprock and South San Juan from storage in the Navaho Dam (which projects have our strongest support and approval) would leave the streambed of the San Juan River below the Navaho Dam without water to move the great quantities of sediment which flow into it with the floods from torrential rains in the area.

Our canal diverts water from the south side of the San Juan River opposite and just downstream from the mouth of the pump arroyo. This ordinarily dry tributary of the San Juan River drains nearly 125 square miles of rough and highly erodible country. Without regular streamflow in the river at that point, the streambed (and the heading of our ditch) would be filled with sand, to be added to with each succeeding run of water from pump arroyo. A lifetime of experience and observation of everyday contact with the factors involved convinces us that the conditions we foresee have been prevented through the years only by the normal continued streamflow, some sufficient part of which, we think, should be maintained. Without this protection we are sure you will wish to provide, in any authorization, for prompt remuneration for losses to be sustained, if, and when, they occur.

Respectfully submitted.

Turley Ditch Co., Mrs. Abel Lobato, Pat D. Montoya, Emilio Chavez, Jose E. Chavez, Rosa Archuleta, Benito Archuleta, Silviano Chavez, Onofre A. Lobato, Flavio D. Chavez, Wm. Gutierrez, Alcario N. Lobato, Adolfo D. Lobato, Directors.

BLOOMFIELD IRRIGATION DISTRICT, BLOOMFIELD, N. MEX.

Bloomfield Irrigation District, organized under the laws of the State of New Mexico, operates a main canal some 40 miles long, on the north bank of the San Juan River between the site of the proposed Navaho Dam and the mouth of the Animas River near Farmington, in San Juan County, N. Mex. From the upper 10 miles of its canal the district delivers water to the Pump Ditch Co. and to the Jaquez Ditch Co. Near the town of Blanco the canal enters the district proper, in which it delivers irrigation water to some hundred farms, as well as domestic water to the villages of Blanco and Bloomfield.

Most of the farmers of the 3 companies served have owned and operated their irrigated farms for from 35 to 50 years. Several speak from a family background of almost a hundred years' experience in operation and maintenance of irrigation ditches on the San Juan River.

There is unanimous agreement in San Juan County as to the benefits to be derived from the building of an integrated Navaho Dam-Shiprock-South San Juan irrigation project. Land and water are here. The economic, as well as the human, values inherent in this development are immeasurable. Bloomfield Irrigation District, the Pump Ditch Co., and the Jaquez Ditch Co. strongly urge its authorization; and that the size of the project, the needs of the people to be served, and the adequacy of its water supply be determined without consideration of conflicting claims for San Juan River water. Friends and neighbors of the Navaho people, and irrigation farmers ourselves, we have some firsthand knowledge of the problems with which they will have to contend and, particularly, of the disastrous results certain to accompany an insufficient supply of water.

Bloomfield Irrigation District, the Pump Ditch Co., and the Jaquez Ditch Co. (and, we believe, 95 percent of the people of San Juan County) have always been opposed to the policy of "coordinated planning" in connection with the waters of the San Juan River, foreseeing that through the operation of that policy the whole program of in-basin development would become (as it has) almost inextricably involved with the San Juan-Chama transmountain diversion project. We, and the people of the county, are now and always have been opposed to "concurrent authorization" or any other authorization involving the Navaho Dam and the Shiprock-South San Juan projects with the San Juan-Chama transmountain diversion. The proposed San Juan-Chama transmountain diversion is not, nor will it ever be, a part of the Navaho Dam-Shiprock-South San Juan project, nor will it ever be dependent on the Navaho Dam for its water supply. It is an entirely separate project, should be so considered, and should have to stand or fall on its own merits as a consumer of such surplus water from the San Juan River as is not needed, or to be required for development and use,

by an integrated Navaho Dam-Shiprock-South San Juan or other in-basin projects.

Again we warn against the general tendency to gear the appropriation of irrigation water to that available in the years of most plentiful supply. This overappropriation is the cause of the troubles sought to be solved by the plan for the diversion of part of the San Juan River to the Rio Grande watershed, a plan with which we ourselves would readily agree were there adequate supplies of water in the San Juan River with which to meet that demand in addition to our own in-basin requirements.

There are two main reasons for our opposition, both of which stem from the fact there is not water available in this part of the San Juan River for the various projects proposed for development through the upper Colorado River program.

Our first reason is a selfish one: The out-of-basin diversion of such an amount of water as contemplated for the San Juan-Chama project, in addition to the needs of the vital Navaho Dam-Shiprock-South San Juan development, would dry up the streambed of the San Juan River between the Navaho Dam and the mouth of the Animas River near Farmington. In this area infrequent torrential rains on more than 2,500 square miles of highly erodible country on either side of the San Juan River cause floods of silt-laden water to flow into this part of the San Juan River. If the streambed be dried up, this silt will continue to accumulate year after year, one irrigation project after another will be abandoned, and the whole valley go back to desert. We believe there is no solution other than a continuing flow of water in a "live" stream to keep this sediment moving.

The second reason is based on our belief that the diversion of such an amount of water as contemplated for the San Juan transmountain diversion would so reduce the amount of water available for in-basin projects as to render them infeasible. We quote from page 146 of the Colorado River: "This project (San Juan-Chama diversion) would utilize the same water supply as would the South San Juan project, consequently both could not be constructed."

Certain figures used in Progress Report, New Mexico Technical Committee, March 7, 1952, seem to show water available for all these projects though admitting "tolerable" shortages would be suffered. However, we think there must be some error in the figure of 23,000 acre-feet frequently used for the "bypass for use below Blanco," and to include the potential Hammond project. This Hammond project will require 18,400 acre-feet of water while adjudications of water to the presently existing ditches in that area amount to some 155 cubic-feet per second. This would account for another 55,000 acre-feet through an ordinary irrigation season. Thus, the bypass figure for use below Blanco should be 73,000 acre-feet instead of 23,000. (It should be noted that this figure is not for consumptive water, but is that for the depletion of the stored water in the Navaho Dam through withdrawals for use, and must include evaporation, seepage, and other losses incident to transportation.)

The same report uses, for the computation of the average modified flow of the San Juan River at Blanco, flow measurements made at that point before the completion of the Vallecito Dam on Pine River in 1941. This dam has somewhat lessened the flow of the San Juan River at Blanco. This lessened flow can be shown properly by the use of flow measurements made since the completion of that dam.

(The figures which follow are modified for certain potential upstream developments. The use of the Blanco station runoff figures for 1952 and 1953, furnished us by the State engineer, increase the average for the years since 1942. They were included.)

The flow figures used in the above-quota reports for the years from 1928 to 1941 show an average of 975,000 acre-feet annually. However, we have objected to the figure for the year 1941 as being excessive and unrealistic. While its use would add much to the discrepancy we seek to show, we think this abnormal figure should be eliminated from all consideration, in which case the average for the 13 years from 1928 to 1940 would be 875,000 acre-feet annually, while the years of 1942 to 1953 average 793,000, this being for those years since the completion of the Vallecito Dam. From this we assume an annual reduction of river flow of 82,000 acre-feet chargeable to the operation of the Vallecito Dam, certainly a modest figure for such a project. This amount, added to the bypass discrepancy, makes 132,000 acre-feet of nonexistent water said to be available for the San Juan-Chama transmountain diversion.

That this water is nonexistent is not to say that the San Juan-Chama project would not get that water, as it would have first chance at San Juan River water

high in the mountains of Colorado. It does mean that, should that project become a reality with its 235,000 acre-feet average diversion from the San Juan River, this 132,000 acre-feet would have to be added to the shortages already admitted as applying to the Navaho Dam-Shiprock-South San Juan project.

The New Mexico Technical Committee reduced, or modified, the historic (or actual) flow figures for the San Juan River by an amount sufficient to develop certain potential in-basin, upstream projects in both New Mexico and Colorado. Should these in-basin New Mexico projects not be constructed, the 48,000 acre-feet allowed for their use would be available for other purposes.

For Bloomfield Irrigation District :

W. L. HARE.
J. W. DOAK.
RAFAEL PRODO.

For Pump Ditch Co. :

ISMAIL MUNIZ.
ELIAS ULIBARRI.
PABLO GONZALES.

For Jaquez Ditch Co. :

T. S. ARCHULETO.
VALENTIN ARCHULETO.
ALEX JAQUEZ, *Secretary*.

Senator WATKINS. We will take a recess and resume as soon as we get back from the floor.

(A brief recess was taken.)

Senator WATKINS. General Grant, you may proceed.

STATEMENT OF U. S. GRANT 3D, FOR THE AMERICAN PLANNING AND CIVIC ASSOCIATION

Mr. GRANT. The American Planning and Civic Association, for which I speak as its president, is grateful, indeed, for the privilege of appearing before you and adding its plea to the pleas of other associations interested in conservation against any legislation that would permit the construction of the Echo Park and Split Mountain Dams in the Dinosaur National Monument. Beginning as the Park and Outdoor Art Association, in 1897, for over a half century our association has been in the forefront of the effort to set aside and protect for the inspiration and enjoyment of future generations the natural and scenic wonders of our great country by establishing them in national parks and national monuments. Their aggregate area is insignificant, as compared with the total area available for commercial and agricultural development and exploitation. We respectfully submit that they are a national heritage, which should be preserved unharmed for future generations.

2. The appreciation of the American people for the policy heretofore established and maintained by Congress is amply confirmed by the large number of visitors who now annually spend their increasing leisure time in the national parks and monuments. The recognized overcrowding of those set aside and our rapidly increasing population would manifestly justify the setting aside of new additional areas and make it more important to save those already established.

Since the establishment of the National Park Service in the Department of the Interior in 1916, no exception has been authorized to the policy enunciated by Congress in the act establishing said Service; namely, that the national parks, monuments, and reservations shall be administered "to conserve the scenery and the natural and historic

objects and the wildlife therein, and to provide for the enjoyment of same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

3. Aside from the deposit of dinosaur remains, which would not be affected by the proposed dams, the essential features of the Dinosaur National Monument are the canyons of the Green and Yampa Rivers, which were the justification for the enlargement of the monument in 1938 and which the proposed dams would blot out, filling them with water to near the top of their nearly vertical walls. No one can soundly deny that the reservoir would thus destroy the impressive and somewhat awesome scenery which is the heart of the monument, besides drowning out the multiplicity of little valley parks which now can be used as camping places and from which the canyons are best seen in all their grandeur. It was to prevent just such destruction of the Nation's heritage that Congress amended the Federal Power Act in 1921 and 1935 to prohibit the granting of permits for power development in the national parks and monuments. Our association cannot believe that Congress will now authorize an agency of the Federal Government to violate this long-observed policy and do irreparable damage to this important and unique national monument, the justification for which is soundly contested on economic grounds and which is prohibited by law to private enterprise.

4. Permit me to emphasize that our association is not offering any objection to an upper Colorado River Basin storage project, but only to the one element of that proposed by the Bureau of Reclamation, namely, the Echo Park and Split Mountain Dams in the Dinosaur National Monument. Indeed, appreciating the need of the arid upper Colorado States and the obligations they have assumed to furnish 75 million acre-feet of water at Lees Ferry every decade, we approached the problem constructively and were happy to find that the Bureau's own reports and recommendations included alternative dam sites which could adequately replace the Echo Park Dam in the first phase, and possible substitutes for the second phase which have greater or equal power and storage potentialities at even less initial cost (tables 1 and 2, attached, give the comparison).

5. This suggestion accordingly made at the hearing before the Secretary of the Interior on April 3, 1950, was met by the allegation that the proposed substitutes would involve an increased loss by evaporation of 350,000 acre-feet of water a year. In my memorandum to the Secretary of the Interior in August 1950 I pointed out some egregious errors in this claim, and that, by the Bureau of Reclamation's own figures, this alleged difference in evaporation loss was in error by approximately 50 percent; and furthermore, that the forecast of evaporation loss was not susceptible of accurate determination, that the factual basis of its determination (while doubtless the best immediately available to the Bureau, i. e. six panobservation stations located at considerable distances from the dam sites) is too limited to give reliable results.

This is especially valid when it is realized that either a difference of 1 mile in the assumed average wind velocity, or of only $1\frac{1}{2}^{\circ}$ Fahrenheit in the assumed average water temperature, may give an error of 10 percent in the results, and that the probable error of the computation for any one unit may be as high as 25 percent. There

is no available indication that the Bureau has any long record of observations for average wind velocity or reservoir water temperature at the proposed dam sites.

I think that statement is really a very valid statement in regard to the evaporation question. In other words, we talked about this in figures that are overall general estimates, which may be quite in error in each individual case.

Senator ANDERSON. Would you just discuss what you said in sort of conversational language, because I have a little difficulty in making sure that I follow exactly what you mean by that.

Mr. GRANT. The evaporation loss has to be computed on some theory. There are 2 or 3 formulae for that. You have to assume since the reservoirs are not there and you have no field observations to base this computation on, you have to assume what the wind velocity is and what the average water temperature is and that a difference in that assumption as to 1 mile in the average wind or $1\frac{1}{2}^{\circ}$ Fahrenheit in the average water temperature would make a difference of at least 10 percent in the results.

I am trying to bring out the fact that these evaporation arguments, while we take an area multiplied by an assumed evaporation factor, they are not scientifically dependable.

Senator ANDERSON. You might state, for example, what the evaporation loss was at Lake Mead and try to translate that to Glen Canyon, but there might be a completely different set of circumstances at Glen Canyon.

Mr. GRANT. That is right.

Senator ANDERSON. Is it true there are certain valleys where the wind seems to blow and certain others where the wind seems not to blow, but you would have to know what actually happens before you could measure it exactly?

Mr. GRANT. To go further, the humidity of the wind or lack of humidity makes a difference, and even the direction of the wind and the shape of the reservoir may make some difference. However, those are a little bit less important.

Senator ANDERSON. This is a point on which you have attracted my curiosity. Was any calculation made on Lake Mead before it was constructed and any check of the accuracy of that calculation after construction?

Mr. GRANT. That I don't know.

Senator ANDERSON. It just occurred to me as something interesting.

Mr. GRANT. The Secretary of the Interior has acknowledged this mystery, he calls it in fact one of the major hydrological mysteries. Experiments are going on at Lake Hepner now in which they are trying to develop first of all which of these formulas is correct and, second, by actual observations how the evaporation varies with wind and water temperature, and things of that kind.

Senator ANDERSON. Thank you very much.

Mr. GRANT. So that it is not a definite measurement.

Senator WATKINS. May I ask you some questions there, General? If I understand you correctly, and the other testimony we received is in agreement, the surface in proportion to the amount of water stored is much less at Echo Park site, than some of the other sites.

Mr. GRANT. It is less than at some and surface size has a great deal to do with it.

Senator WATKINS. In other words, there would be less evaporation from the well than there would be from a pond that might have the same amount of water. The pond might be 2 feet deep and the well would be whatever depth was necessary to hold the same amount of water.

Mr. GRANT. That is right.

Senator WATKINS. You don't have to perform experiments to know that it is from the surface that you would get your evaporation.

Mr. GRANT. Yes, sir. The surface and shape has a good deal to do with it. Of course, the location and the shape—if it is an oblong shape and it is in the direction of the wind, it will have a great deal more evaporation than if it is across the direction of the wind.

Senator WATKINS. Do you know the area of the Echo Park region?

Mr. GRANT. Yes, sir.

Senator WATKINS. Have you been there?

Mr. GRANT. No, sir, I haven't indeed been there.

Senator WATKINS. Do you have any data with respect to the winds and direction of the winds?

Mr. GRANT. No, sir; I haven't been able to find any. I don't think the Reclamation Service has any at the dam sites.

Senator ANDERSON. In order to satisfy somebody who just happens to be curious, Mr. Larson, would you tell us if the Department has any record as to what the computation was on evaporation losses at Lake Mead prior to the construction of the reservoir and what has been developed after construction, and any data they may have on other areas, for instance, Elephant Butte Dam in my State?

The Bureau of Reclamation has to deal with a great many unknown factors, and I am just wondering how their guesses which they had to make, coupled with the scientific calculations, finally worked out.

Mr. GRANT. They used the best information they had evidently, and that is the best they could do.

Senator ANDERSON. I didn't accuse you of being critical of them. Now that you have mentioned this subject, you have excited my curiosity and I would like to know how some of these estimates worked out. We like to know how these estimates work out as to cost. We know that and have a chance to calculate that, but evaporation losses are something on which I have never seen a figure, and I would like to see what does happen between the calculated loss and actual loss 20 years later.

Mr. GRANT. I hope I might find out the answer.

I would also like to point out another thing in this connection and that is that the area of the lake does not remain constant because these reservoirs are going to be filled with water, and then reduced, and it makes a great deal of difference how the water surface is operated as to what the size of the water surface is.

Senator WATKINS. I wonder at this point, General—or would you rather wait until you finish your paper—I want to know step by step how to determine evaporation losses. I assume you have had some acquaintance with the process.

Mr. GRANT. Some acquaintance.

Senator WATKINS. Would you like to do it now or would you prefer to wait until you have finished reading?

Mr. GRANT. Maybe I had better wait until I finish.

Senator WATKINS. All right.

Mr. GRANT. Evidently, on reconsideration, my doubts as to the alleged increased evaporation loss were found valid, as in recommending the inclusion of the Echo Park Dam before the House committee the Interior Department based it on an increased evaporation loss of 100,000 acre-feet annually, and has since corrected this differential first to 70,000 acre-feet and subsequently to 25,000 acre-feet. In view of the inadequate observed data, the effect of any minor error in the assumptions, as indicated above, and the fact that the aggregate evaporation loss accepted for the program by its proponents is 846,000 acre-feet annually, or nearly 34 times the remaining differential advantage claimed for the Echo Park Dam, with a probable error 4 to 6 times as great, the evaporation argument has indeed evaporated.

Senator WATKINS. The error you speak of was related to the high Glen Canyon Dam?

Mr. GRANT. I think they changed from 70,000 to 125,000, according to the Under Secretary's statement related to Glen Canyon.

Senator WATKINS. High Glen Canyon?

Mr. GRANT. Yes.

Senator WATKINS. You understand there are two different dams mentioned, do you not?

Mr. GRANT. Yes, sir.

Senator WATKINS. You know that the High Glen Canyon dam was never considered as an alternate, do you not?

Mr. GRANT. It was suggested, and it has some quite interesting possibilities.

Senator WATKINS. It was investigated, it is true, but that would run into the same trouble you have now, that it would invade the Arches National Monument if you built the High Glen Canyon dam.

Mr. GRANT. It has been claimed, and I think probably it is a just claim, that protection could be given by the retaining wall which would keep the water out for a small dam.

Senator WATKINS. In other words, you would have to dam the reservoir at both ends, is that right?

Mr. GRANT. I beg your pardon?

Senator WATKINS. You would have to dam the High Glen Canyon at both ends?

Mr. GRANT. No, sir. I believe it would be at the side where it would possibly back up some water into the Rainbow Bridge Monument, or something. I have forgotten which one it is there. There are a great many monuments there.

Senator WATKINS. As a matter of fact, in studying the program, you know it was never seriously considered to use the High Glen Canyon dam as an alternate to Echo Park under any circumstances, do you not?

Mr. GRANT. It was mentioned and studied and discussed at the hearings before the House committee, sir; that is why I felt—

Senator WATKINS. I think the only one who actually may have said something about it was Mr. Tudor, wasn't it?

Mr. GRANT. Mr. Tudor, Mr. Brower, and in the opposition statement.

Senator WATKINS. Yes; the opposition mentioned it.

Mr. GRANT. They discussed it at considerable length and showed some of the mistakes that had led to the statement of what the evaporation would be there, arithmetical mistakes really, and that using

the figures and proportions that had been given by Mr. Tudor, it indicated that a Glen Canyon Reservoir about 38 feet higher would actually evaporate less than the project for the Echo Park Dam.

Senator WATKINS. You mean would actually evaporate less than Echo Park?

Mr. GRANT. Yes, sir. As I remember it, it is 20,000 acre-feet less. That was just arithmetically applying the principles that had been given in the testimony of the proponents.

Senator WATKINS. In other words, if you increased the height of Glen Canyon Dam 38 feet, it would expand the amount of surface exposed, would it not?

Mr. GRANT. Yes, sir.

Senator WATKINS. But you would have less evaporation that way than if you left it at the original height, as per the original program.

Mr. GRANT. That is the way it figured.

Senator WATKINS. Wouldn't you think there was something wrong with the figures?

Mr. GRANT. There was something wrong with the other figures because they have reduced them from 100,000 to 70,000 and then to 25,000.

Senator WATKINS. To be fair about it, did you see the testimony of Mr. Tudor the other day?

Mr. GRANT. No, sir, I wasn't here.

Senator WATKINS. I think he still stays with the 100,000 to 120,000 figure. He doesn't back up an inch on the comparison of the alternate dams.

Mr. GRANT. Without considering the Glen Canyon—

Senator WATKINS. Without considering High Glen Canyon.

There is a low and a high Glen Canyon and quite a difference between the two, a 38-foot height on the high dam. I don't know if that is the actual height talked about for the High Glen Canyon, but there is a considerable difference between that and the low dam.

Mr. GRANT. He spoke of 50 feet additional height, sir.

Senator WATKINS. So to be fair to Mr. Tudor, in spite of all of the so-called errors, "evaporation which is evaporated," he still maintains it, and I think probably in a contest over the figures as to who is right and who is wrong, he would come out close to being right.

Mr. GRANT. Except you will remember the first figure was 350,000 acre-feet.

Senator WATKINS. That was not Mr. Tudor's figure, though.

Mr. GRANT. They have acknowledged the error.

Senator WATKINS. That was some preliminary investigations that had to be restudied. Unfortunately, sometimes the fellows in going along get rather enthusiastic on the investigations, and before they get all of their outlines and a complete study made they are requested to do some calculating. I doubt that there was any final determination to show the difference of 350,000 acre-feet in the evaporation figures.

Mr. GRANT. It was formally stated, sir, and I believe you will find that the figures they gave you also in your statement in the Senate included the 350,000 acre-feet loss. This is a reduction of two-thirds of that. So there was an error in it.

Senator WATKINS. There are still some, as you say, in this very uncertain field who think it is around 300,000.

So you are doing some speculating when you get it down and say now it is only about 25,000. Is that your judgment as between the alternate sites that are seriously considered, that there is only 25,000 acre-feet in favor of Echo?

Mr. GRANT. It would make a difference as to which alternate you take.

Senator WATKINS. Leave out the High Glen Canyon and go on from there.

Mr. GRANT. I don't remember for the moment, sir, just what it works out at, but it is nothing like the 350,000.

Senator WATKINS. Does it compare with Mr. Tudor's statement of, say, 100,000 or 120,000?

Mr. GRANT. I think it might be maintained to be somewhere around there, allowing for the inaccuracies and difficulties of getting any definite determination.

Senator WATKINS. It could just as easily be a mistake getting it too low as too high?

Mr. GRANT. That is possible.

Senator WATKINS. But you want to take it on the low side?

Mr. GRANT. No, sir, not particularly. I am just interested in showing that the argument was not a very sound argument.

Senator WATKINS. I am just an ordinary layman and I would still take my comparison of the deep well as compared to the pond. I think Echo in its location, its physical location at a higher elevation than the others downstream, and the depth that it will have at the dam site at least, compares very favorably with the example used. Maybe it is the well as compared to some of the other sites.

Mr. GRANT. I think you are perhaps giving credit to the canyons for containing nearly the entire Echo Park Reservoir, but they are only a small proportion of the reservoir. It extends over flat country outside of the canyons quite a distance. That doesn't really play as much part in it as one would think in thinking of it as a comparison between a well and a pond because there is a lot of pond to that reservoir.

Senator WATKINS. I understand, of course, you can't have all straight up and down canyons. In fact, looking at some of the photographs, I wonder where the straight up and down canyons are as compared to the total height of the canyon. A small part of it is perpendicular and the rest is vertical, as you mentioned in your statement.

Mr. GRANT. Yes, it goes back somewhere around 600 feet, it begins to go back quite drastically.

Senator WATKINS. It isn't quite a 500-foot depth at the dam site according to the height of the dam mentioned.

Mr. GRANT. Well, the whole thing slopes up a bit, sir.

Senator WATKINS. What would be the depth of the water at the dam site at Echo?

Mr. GRANT. I think it is 525 feet as I remember it. That is subject to correction.

Senator ANDERSON. Five hundred feet would be the depth of the water when full.

Senator WATKINS. That is what I had in mind. You may proceed, and we will let you get through with your statement and then we will have more questions.

Mr. GRANT. Having disposed of the major advantage claimed for the Echo Park Dam site, on which much more might be said but it is highly technical and may well be left to such questions as you may wish to ask, it is noted that in his report of November 18, 1953, to the Secretary of the Interior, the Under Secretary says:

There would be substantial loss in electric generating capacity if any of the alternate sites were selected. While this is a matter of economic importance, I do not attach as much weight to it as to the loss of water. The power loss could be replaced by steam power at some increased cost.

The comparison in the Reclamation Bureau's own figures, as set forth in attached tables 1 and 2 indicates an actual gain in power potential, according to the Bureau's computations with a saving in first cost of \$59,400,000.

Those were 1950 costs, which go up, and presumably the saving would have gone up.

Senator WATKINS. Who made the computations to show that the saving was made? Did you do that?

Mr. GRANT. I took it from the Reclamation Bureau's report, and I have corrected figures I got from the Interior Department.

Senator WATKINS. Who took their figures and worked out the computation from those figures?

Mr. GRANT. I simply put down the figures and added them together, sir, and there are the results in tables 1 and 2.

Senator WATKINS. In other words, you did the computing from their records?

Mr. GRANT. From their records.

Senator WATKINS. That is what I tried to find out.

Mr. GRANT. All those figures are their figures except the differences and the sums.

Senator WATKINS. And the conclusion you came to?

Mr. GRANT. Yes, sir, the conclusions I am willing to be responsible for.

Senator WATKINS. I don't know how they would figure that out, but we will give them a chance to figure it. Will you give us those figures and show us just how you arrived at that, please?

Mr. GRANT. Well, I took the figures given for Gray Canyon and Cross Mountain, which were to be brought forward and they were projects that were in the Reclamation Bureau's overall program, brought them forward to the first phase instead of Echo Park. That gives you a comparison of a gain of water storage of 800,000 and to annual power of 153 million kilowatt-hours, and an additional cost of \$88,300,000.

That is for the first phase, but that would be absorbed and the gain comes in using the alternatives for Echo Park in the second phase.

Senator WATKINS. You considered Gray Canyon and Cross Mountain to be an alternate site?

Mr. GRANT. Those were the ones——

Senator WATKINS. You understand they are not alternate sites, but part of the regular program?

Mr. GRANT. Yes, sir, that is the point I make. In other words, they were projects that were approved by the Reclamation Bureau.

Senator WATKINS. In fact, you have to have nine dams to even get anywhere in the storage of water necessary to fulfill the commitments

the upper basin has made to the lower basin and have any water left for the upper basin.

Mr. GRANT. They divided their program into a first and second phase, and my proposal was that they move the Gray Canyon and Cross Mountain forward into the first phase and postpone the Echo Park to the second phase.

Senator WATKINS. Why do you want it postponed?

Mr. GRANT. Because we feel that it should not be built and——

Senator WATKINS. You want it postponed permanently but not just to the second phase?

Mr. GRANT. Yes, sir.

Senator WATKINS. Would you agree it could go to the second phase?

Mr. GRANT. Yes, sir.

Senator WATKINS. Will you support it for the second phase?

Mr. GRANT. No, sir. Table 2 shows you what can be changed, the substitution that can be made in the second phase.

Senator WATKINS. As I understand it, it is the desire of not only the upper basin but the lower basin as well, to have as full a development of the entire river basin as we can get. If we are going to make any development at all upstream so they can have water and energy downstream, it will take all the feasible sites on the river to harness and regulate the flow. Do you understand that?

Mr. GRANT. I do not take the entire first phase of table 1. I merely showed you the difference that might be put in the first phase instead of Echo Park.

Senator WATKINS. I would say if you agree that if they put off Echo Park until the second phase and use others of the proposed dams as alternates for the first phase, and agree that when the second phase comes around they could build Echo Park, you might get some encouragement.

Mr. GRANT. It isn't necessary in the second phase.

Senator WATKINS. What you are saying, in effect, is you are against it first, last, and all the time.

Mr. GRANT. Oh, yes, Senator.

Senator WATKINS. So why say anything about the second phase and put it off until that time?

Mr. GRANT. Then in the second phase I propose some alternatives, and I made a mistake there. I put in the New Moab Dam, and the New Moab Dam will back water into the Arches National Monument, which I realized after the hearing on April 3, 1950; so in my August memorandum I suggested the Dewey site instead of the New Moab site.

That would complete the second phase without the Echo Park or Split Mountain Dams and give you 1,130,000 acre-feet more storage and 181 million kilowatt-hours more firm power and save \$59,400,000, and that is all their figures and not mine.

Senator WATKINS. Is this your own computation and have you arrived at these conclusions on your own analysis of the situation?

Mr. GRANT. No, sir; I took their figures.

Senator WATKINS. What I am wondering is, have you had other engineers figure this for you?

Mr. GRANT. Not this part, sir. I was concerned with the program as proposed by the Reclamation Bureau, and I thought that it was

possible, as I showed here, to put in substitutes for the Echo Park and Split Mountain Dams and still come out with a better project than if you had the Echo Park and Split Mountain Dams in it.

Senator WATKINS. And still have plenty of storage?

Mr. GRANT. More storage and more electric power and cost less. In doing that I used entirely the figures of the Bureau of Reclamation that I had from the Interior Department.

Senator WATKINS. You didn't use their conclusions; you just used some of the figures along the line and then worked out your own formula, your own line of reasoning; isn't that right?

Mr. GRANT. No, sir, I merely added their figures and showed the results.

As it was found that the New Moab Dam (originally proposed by me as an alternative site, table 2) would back water up into the Arches National Monument, in August 1950, I suggested the Dewey Dam as a substitute.

Senator WATKINS. I spoke on the Senate floor and pointed out you would destroy the Arches National Monument, and that changed your mind?

Mr. GRANT. You caught me, Senator.

Senator WATKINS. We can all make errors.

Mr. GRANT. I certainly can.

Senator WATKINS. I have made a lot of them, I know.

Mr. GRANT. The loss of potential electric power could hardly be "substantial," as the Bureau had recommended the same installed power as for the New Moab. In any case any slight power differential that might be found in working out the Dewey Dam design could be made up when and if found necessary by steam power auxiliary, as suggested by the Under Secretary, such auxiliary steam power being probably necessary anyway because of the great variation in stream-flow volume.

Senator WATKINS. You don't take seriously the suggestion about using steam power there, do you? It isn't actually cheaper or anywhere near as cheap as the hydroelectric power is it?

Mr. GRANT. The construction costs are cheaper, sir, but after you have got the construction, the hydroelectric power should be cheaper to make, and there again you get into a very involved computation.

Senator WATKINS. The people, General, who are operating on a practical day-to-day basis, running a going concern of furnishing electric energy, ought to know which would be better for them, is that right?

Mr. GRANT. Yes, sir.

Senator WATKINS. You realize the utilities companies in Utah, Colorado, Wyoming, New Mexico, and Arizona have offered to take all this power notwithstanding the fact that in at least three of those States they have immense quantities of coal available for steam power purposes?

Mr. GRANT. Yes, sir, I think you will find, of course, most of these multiple-purpose dams are fairly new as I remember it. I mean, they have been built in the last 20 years, most of them, but I think that they are finding that the variation of water and the unreliability sometimes of having all of the water they expected makes a steam auxiliary plant desirable in many cases.

Senator WATKINS. They use them occasionally to firm up their power but most of them are delighted to get hydropower.

Mr. GRANT. I agree with you that the hydroelectric power is cheaper to make after you have your plant in.

Senator WATKINS. It goes on for say several hundred years.

Mr. GRANT. They figure these dams will silt up in 200 years, so that it is not a permanent resource but 200 years, after all, is a somewhat temporary period in history.

Senator WATKINS. I wanted to make this point and see if you wouldn't agree. These people who are in the business of generating electricity for the market, who know the costs and who have steam plants and hydro plants, were willing to come and enter into a contract to take all of the power produced at all the dams in this project. They have offered at the House hearings, and they will offer again in the Senate hearings. Would that not be a pretty good indication that they believe, as practical men, that the hydro power is much more desirable?

They do have some steam plants to firm up their power occasionally, but if this program for the upper basin is operated as planned—that is the various reservoirs used in connection with the others to get the utmost output of electric energy from the operation and use of the stream—then that program ought to be a rather good program, shouldn't it?

Mr. GRANT. I think that when they say they think it is a good thing if they can get it cheaper than they can make it by steam, which they should be able to do in some of these cases.

Senator WATKINS. At least they were willing to buy it notwithstanding they had ample coal and other facilities for steam plants.

Mr. GRANT. Isn't that based on the cost that it is to be sold at?

Senator WATKINS. I beg your pardon?

Mr. GRANT. Their readiness to buy it is based on its being sold at 6 mills.

Senator WATKINS. That is right.

Mr. GRANT. And it costs them 7 mills or over to make it by steam.

Senator WATKINS. Under those circumstances I think the argument about the steam is completely answered by the people in the business when they come in and say "We prefer to buy the hydro and are willing to," and it can be sold at 6 mills.

Mr. GRANT. According to this figure, it ought to be 181 million kilowatt hours firm power more if you take the substitute I have suggested than if you take the Echo Park and Split Mountain combination.

Senator WATKINS. That is according to your calculations?

Mr. GRANT. That is taking the figures I got from the reports of the Bureau of Reclamation.

Senator WATKINS. You understand that the men who are graduates of some of our best engineering schools, men who spent almost their lifetimes working on this type of project, are the ones who make the calculations and come out with something quite different?

Mr. GRANT. Mr. Larson in his statement, I believe, said there would be 185 million less of power instead of more.

Senator WATKINS. I don't have his statement before me. You mean there would be less at the Echo end than at the others?

Mr. GRANT. No, sir, the substitute would give you less power by that amount.

Senator WATKINS. That is quite a difference.

Mr. GRANT. That is not the way the figures in the report show it. So I merely point out that I am not presenting any original figuring of the power, possible power output, sir, because that is quite a job to do. I would have to have a staff and quite a number of people to help me do that in any reasonable length of time.

Senator WATKINS. As a matter of fact, General, as a result of your experience in life, haven't you considerable confidence in these men who have a special job to do, who spend literally years working at that kind of thing and have to check and recheck, and as you know they are checked at Denver and checked again in Washington.

Mr. GRANT. Yes, sir.

Senator WATKINS. And all of the experts on the outside take a look at it, the Army engineers and private engineers. You never see of it, but they take shots at it. They have to go through that barrage of criticism and check and countercheck.

You realize they have to acquire experience and ability in that line of activity over the years and they have to have confidence in them if they run the barrage and come out with something that can stand up.

Mr. GRANT. I agree with you there, but I am pointing out in this case—you said yourself we are not all infallible—that they have made mistakes in presenting their arguments for this Echo Park and Split Mountain project.

Senator WATKINS. I think they have corrected them all. They were honest about it and when they made a mistake, they are willing to say, "We apparently picked up the wrong figures."

Mr. GRANT. They have never showed any mistake in the tables that I have put there, sir.

Senator WATKINS. Well, they didn't have time. They hadn't been discovered at that particular moment.

Mr. GRANT. That was presented back in 1950, sir.

Senator WATKINS. You mean they haven't admitted any mistake with reference to the matter you called to their attention?

Mr. GRANT. I don't remember ever having any statement from the Reclamation Bureau showing me any flaw in that presentation I made, excepting the claim that it would involve 350,000 acre-feet of loss of water by evaporation. That was the only counter that came to that or has ever come to that table until Mr. Larson here has given a figure.

I haven't found it exactly. I don't know that I can lay my hand on it. But he did give a loss of electric energy which, however—or electric potential—which, however, as Mr. Tundo said, can be taken care of with steam power and may need the steam power auxiliary plants anyway.

Senator WATKINS. It is possible when they get to operating. You can't tell what nature will do. You might have to have a few steam plants.

Mr. GRANT. In the millions of kilowatt-hours firm power, that amount of, I think, 185,000 is not a very important amount.

Senator WATKINS. Let me ask you this, General. Have you made any study of how Echo Park would fit in with Split Mountain, with Cross Mountain, and with Flaming Gorge as to the operation and

regulation of the river and as to making possible the best peaking operation for power development in those reservoirs, including Echo?

Mr. GRANT. The recommendations of the Bureau of Reclamation indicate that they worked in perfectly well, sir.

Senator WATKINS. They do what?

Mr. GRANT. They worked in perfectly well.

Senator WATKINS. That was one of the reasons why they insisted Echo was a necessary reservoir because it did permit the peaking, getting the maximum peaking operation out of this power generation by using all these reservoirs together. It was almost like the main-spring of the watch.

Mr. GRANT. If there are other sites which would do the same thing—

Senator WATKINS. It is your judgment against theirs. You have never been there?

Mr. GRANT. I have flown over the country.

Senator WATKINS. You have never made an investigation?

Mr. GRANT. No, sir.

Senator WATKINS. You have never gone over the field notes. How long has it been since you were in the practice of engineering, General?

Mr. GRANT. About 9 years or 8 years.

Senator WATKINS. About 9 years. Have you ever had to figure out problems of this kind?

Mr. GRANT. Yes, sir. I was on the board of engineers for about 2 years, and we had a great many such projects that came before us and we tried to be sure that they were sound before we recommended them. We had to go over them very critically, and I think we did.

Senator WATKINS. Usually you agreed with the men in the field, didn't you?

Mr. GRANT. Not always.

Senator WATKINS. Not always.

Mr. GRANT. There were many, many cases where we picked up minor mistakes they had made in the estimation of benefits and estimation of marketing costs and things of that sort.

Senator WATKINS. On the whole, since you don't oppose any other part of the project except Echo Park, you think this project must have been rather well conceived and worked out, so that it would be an effective way to get water for the upper basin States to put to use out of their share of the Colorado, don't you?

Mr. GRANT. No, Senator, I think that such a project could be worked out, but I think that this project as is recommended is unbalanced in many ways and of doubtful economic soundness. But I don't want to go into that.

Senator WATKINS. Do you oppose it on any ground other than your opposition to Echo Park?

Mr. GRANT. Yes, sir; because my final recommendation is going to be that the Senate authorized your committee recommended authorization of some of the dams which seem to be entirely justifiable, and that further studies be made to work out a thoroughly sound project.

Senator WATKINS. You haven't conferred with other engineers in arriving at your conclusions, have you?

Mr. GRANT. Well, yes and no, Senator.

Senator WATKINS. What do you mean by that?

Mr. GRANT. I have talked to other engineers about it. No other engineer has come and sat down and worked with me.

Senator WATKINS. In other words, you just had general conversation with other engineers, who probably had never read the reports, is that right?

Mr. GRANT. In some cases they have not. I think in some cases they have. I am going to point out that I think it would be worth while for the committee to read very carefully the letters of the chief engineers and the letters of the Federal Power Commission, both of them Government departments with long experience in this sort of thing, which I am sure you have copies of.

Senator WATKINS. Do you mean recently or during the administration of Oscar Chapman?

Mr. GRANT. I don't remember the dates, sir.

Senator WATKINS. Have any letters been sent by the Army engineers since the new administration went into power in 1952?

Mr. GRANT. I think so, sir.

Senator WATKINS. I didn't see those. I did see the Army engineers report before. I thought it was completely wrong.

Mr. GRANT. The last statement I heard anything about from the Chief of Engineers I think conceded some points that were made in the first statement but not all of them by any means.

Senator WATKINS. You mean the new Chief of Engineers?

Mr. GRANT. Whether it was after General Sturgis came in or before, I am not perfectly sure, but I think it was after he took charge.

My recollection is he came into office early this year, and this letter was written just soon after he came in.

Then, as long as we are on that subject, may I interpolate that the Engineers Joint Council, which is made up of representatives of the major national engineers societies, has put in a report to your committee—I believe they don't want to appear before the committee, but the report is in your hands—which again very much questions the economic soundness of this project as a whole.

Senator WATKINS. Do they pretend they have ever made a study of it?

Mr. GRANT. I think they have studied it quite carefully. I don't know just how much.

Senator WATKINS. Isn't this about the way a council like that operates? They give a fellow an assignment and he comes in and tells the rest of his associates what he thinks about it from a rather limited study and they say, "Well, we will report so and so on it."

Mr. GRANT. I don't think that is the way engineers work, Senator. I think we are apt to take any statement of that kind quite seriously.

Senator WATKINS. That may be true, but I am just wondering how much time they spent on it. They haven't spent as much time as the Bureau of Reclamation engineers have spent on it. It is easy for a group to sit off to one side and go over this and pick out a few spots without seeing how the things operate in the field and come up with conclusions. If they have an interest in seeing that those conclusions support a certain thesis with respect to a project of that kind, the conclusions are often convenient.

You can't blame us, the people out there who have worked for years and years up to this time so we can subdue that part of the earth and put these resources to work, that we get suspicious of these criticisms.

After years of hard work on our part and comparatively little on yours the suggestions that are supposed to be constructive actually take into consideration only those alternates which we ourselves know we have to use finally to make the project work as it ought to work. That is to put to beneficial use, consumptive use, as much of the water as we can get for the upper basin.

Mr. GRANT. I think, Senator, that the alternative dam sites I have suggested for the second phase to take the place of Echo Park and Split Mountain which is a team, after all, were not in the project as recommended by the Bureau.

Senator WATKINS. There are reasons in every case why those were left out as not the best sites.

Mr. GRANT. I suppose there were reasons.

Senator WATKINS. Do you know what those reasons were? Did you ever study those reasons?

Mr. GRANT. They are not stated.

Senator WATKINS. Did you check with the Bureau engineers to find out what they were before you came up with your conclusions? This is going to cost a lot of money, and our people's future is tied up in this program, and we want something more than just a curbstone opinion on it.

Mr. GRANT. That is why I am very much concerned with it, Senator, and I believe that the start should be made on part of it which perhaps is not open to so much question and that future study should be made.

Now, for instance, in Mr. Larson's testimony he says that they have not yet worked out the facts as to Glen Canyon Dam and that that still is to be done. There is the one part of the project in which you are going to get really cheap power and which is quite important because it will have storage capacity almost to regulate the river system, so that the right amount can be delivered at Lee Ferry.

Senator WATKINS. Don't you appreciate the fact that they should have storage higher up the stream than Glen Canyon?

Mr. GRANT. Oh, yes. And my recommendations in the last paragraph here include a storage reservoir higher upstream for each of the streams.

Senator WATKINS. I haven't read this. It is the first time I have seen it. It is a copy of the letter of the Department of the Army, Office of the Chief of Engineers, signed by S. T. Sturgis, Jr., major general, Chief of Engineers, and reads as follows:

Reference is made to the acting Commissioner's letter of December 15, 1953 to the Secretary of the Army and to the Chief of Engineers, enclosing the revised report of the Secretary of the Interior on the Colorado River storage project and participating projects. The letter referred to Department of the Army comments on the original report which had been furnished the Department of the Interior by letter of July 3, 1951. The revised report was furnished for the information and any further comments determined desirable. The supplemental report accompanying the revised report states that the Colorado River account and the interest of component power revenues will not be used to provide financial assistance to participating irrigation projects. This substantially meets one of the major objections given in our previous comments in that interest in the power investment will be returned to the Treasury until the power investment has been liquidated.

It is noted that only the 2 most favorable storage projects (Glen Canyon and Echo Park) are recommended for authorization instead of the 5 projects previously recommended. Although no detailed information is given on annual charges and annual benefits, it appears that the Glen Canyon and Echo Park

storage projects are justified. It is understood that the Department of the Interior has made an economic reevaluation of the participating projects, which is the basis of the statement in the supplemental report that each of the participating projects has favorable economic justification. As this department has not had the opportunity of reviewing these revised computations, I am not in a position to comment in this regard. The opportunity to review the report is preferred.

It is signed "S. D. Sturgis, Major General, Chief of Engineers."

Mr. GRANT. That is the one I spoke of.

Senator WATKINS. The Chief of Engineers, after reviewing it, seems to be in favor of both Echo Park and Glen Canyon.

Mr. GRANT. He says they are both justified. He doesn't say Echo Park is necessary.

Senator WATKINS. What does "justify" mean if it doesn't mean necessary? I can't understand why one can be justified if it isn't necessary.

Mr. GRANT. I think the point we are trying to make, sir, is that it may be justified as a part of the project, but there are other substitutes for it, so that you will not have to ruin one of the national monuments.

Senator WATKINS. I am sorry, General, to have to break off now, but we will resume your testimony in the morning at 9:30.

The committee session is recessed until that time.

(Whereupon, at 5:40 p. m., the committee recessed, to reconvene at 9:30 a. m., Friday, July 2, 1954.)

COLORADO RIVER STORAGE PROJECT

FRIDAY, JULY 2, 1954

UNITED STATES SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS,
Washington, D. C.

The subcommittee met, pursuant to recess, at 9:30 a. m., in room 457, Senate Office Building, Senator Arthur V. Watkins, of Utah, presiding.

Present: Senators Arthur V. Watkins, Utah (presiding), Thomas H. Kuchel, California and Clinton P. Anderson, New Mexico.

Present also: Elmer K. Nelson, staff consultant engineer, and N. D. McSherry, assistant chief clerk.

Senator WATKINS. The subcommittee will be in session.

It has been suggested by our chairman, Senator Millikin, and concurred in by the present chairman, that we stand in silence for 1 minute out of respect to our late chairman, Hugh Butler.

(A minute of silence was observed in memory of the late chairman, Hon. Hugh Butler.)

Senator WATKINS. Under ordinary circumstances, the committee would recess out of respect to our late chairman, but I am quite certain from what I knew of Senator Butler during his lifetime, his devotion to duty, and his interest in getting the legislative program taken care of, that he would be one of the first to suggest that we do not recess, that we carry on with the work. The best respect we can show to him is to carry on the work of this committee as he wanted it carried on. I am sure he would not think it wise for us to take a recess at this time. So, under those circumstances, we will carry on with the hearing.

There may be some interruptions during the morning. The Senate goes in session at 10 o'clock, and it is possible that the members of this committee may be called to the Senate from time to time, but we will attempt to keep this hearing moving along so that we can give each of the witnesses who have been scheduled an opportunity to be heard. It is the hope of the acting chairman that we will be able to finish at least by tomorrow at noon.

We will call General Grant for further questions.

General, had you finished your statement in chief last night, or had we interrupted?

STATEMENT OF U. S. GRANT 3D, FOR THE AMERICAN PLANNING AND CIVIC ASSOCIATION—Continued

Mr. GRANT. There was about one paragraph more, sir.

Senator WATKINS. We will let you give that last paragraph before I ask you further questions.

Mr. GRANT. May I say, Senator, that at the conclusion of the session you made a statement which was very much in favor of the importance and necessity of the Echo Park Dam in the overall plan. I didn't have any chance to respond before the adjournment, but I would like to simply say now that in spite of your very persuasive statement, I don't agree with you, sir. I still would like to point out that the Echo Park Dam is not necessary to a sound program for the storage of water and the necessary power in the upper Colorado Basin, in my opinion, sir, from the studies I have made of the Reclamation Bureau's report and computations. I just wanted that clear in the record.

And I would also like to point out that I am not trying to prove that the Echo Park Dam might not be a useful thing if it were permissible, but I am trying to prove that it is not necessary, and therefore that many of us at least feel that the policy established by Congress by law and carried out through the years since 1916 should not be violated at the present time in order to build a dam which was not really necessary for the general project. I believe that a good sound project that is economically justified is possible for the upper basin without that dam, and I think I have proved it, and I think that no determining answer, no definite answer has been made to the facts shown by me, that substitute dams would accomplish the same thing, dams which have been proposed and studied by the Reclamation Bureau itself.

Now, it was with the desire to find a solution to help the upper Colorado Basin States to get the water they need and the development they need in approaching the subject constructively that we made the suggestion that the Echo Park Dam and the Split Mountain Dam be eliminated and that we go ahead with the other dams, a tentative list of which I gave, simply because they were properly distributed territorially and would accomplish about the same thing in the way of storage and power and evaporation as the proposals made by the Secretary of the Interior. And the comparison of those with the Secretary's recommendation is shown in table 3 on page 717 of the House hearings record. The table was not reproduced in this mimeographed copy of my statement, by oversight or misunderstanding. And what it amounts to is that the Secretary's recommendation, which is Glen Canyon, Echo Park, and Navaho—Navaho, I believe, being in a somewhat separate category, but still to be included in a different status—gives a total storage of 33 million acre-feet, and installed power capacity of 1,030,000 kilowatts, and an estimated cost of \$502,000,303, with total evaporation—and these are the figures of the Bureau of Reclamation—of 629,000 acre-feet.

My suggestion is that the legislation now before you be so modified as to authorize the Flaming Gorge Dam, which would take care of the needs of the diversion into Utah and would place water storage and power within easy reach of Wyoming. In fact, some of the storage I believe would extend back into Wyoming. And it would not be an encroachment on the national monument. That is one project that was included in the original 1950 report of the Reclamation Bureau.

Senator WATKINS. You are speaking now of Flaming Gorge?

Mr. GRANT. Flaming Gorge, yes.

Senator WATKINS. And it would be included in any overall program for that park. It is part of the regular program?

Mr. GRANT. Yes, but why not build it now instead of building something that is going to do harm forever and ever?

Senator WATKINS. Just a moment. I do not get what you mean when you say, "Why not build it now?" If it is part of a regular program, of course, it could be built now. But how are you going to be helped by building it now?

Mr. GRANT. I think you would get the storage and the power from it sooner than if there is difficulty in getting the recommendations of the Board. I mean, it is noncontentious. Therefore, it could be approved at the present time and you could go ahead with it and get the results which you need up there.

Senator WATKINS. Would it help us any, from the standpoint of your group, if we should postpone Echo Park and build this first? Would you later relent, then, if we built that first? Would that take away your opposition to Echo Park?

Mr. GRANT. No, sir. Because we have shown that Echo Park is not necessary, that there are other substitutes in the second phase which could take its place.

Senator WATKINS. Then why shouldn't we fight it out now and determine once and for all, if you are not going to relent. I thought first that you had something in mind that if we did that first you would not oppose Echo Park on the second step.

Mr. GRANT. Senator, I had not felt that I was fighting anything out. I have merely been interested in putting before the committee the facts in this case, which I believe show two things. One is that the Echo Park Dam is not essential to an overall well-balanced project, by the very figures and computations made by the Bureau of Reclamation.

Senator WATKINS. I know you put some of that in yesterday, in which you showed that if we took the alternative sites we would wind up with a plus of 181 million more kilowatt-hours of electricity, electric energy, and you figured we would have less cost as well, \$59,400,000 as compared with \$88,300,000.

Now, let us just check your figures a moment.

Turn to page 3, your tables 1 and 2 on page 3 of your statement. You have the kilowatt-hours for Echo Park, 1,200 million. And then down in the next table the same identical thing. You have Echo Park, 666 million.

Mr. GRANT. Yes, sir.

Senator WATKINS. How do you explain that?

Mr. GRANT. Those are the figures the Reclamation Bureau has.

There is a change there. The explanation I make to myself is that when you bring the Split Mountain Dam into the picture, you get the increased total of the two working together, but there is a decrease in electric output from Echo Park Dam itself.

But those are the figures of the Reclamation Bureau, so it is not up to me to justify.

Senator WATKINS. It makes both of them very much better, in other words, if you have Split Mountain and Echo Park working together?

Mr. GRANT. Well, it makes it a little better.

Senator WATKINS. It makes it considerably better, does it not?

Mr. GRANT. By about 100,000,086 kilowatt-hours per year.

Senator WATKINS. Well, in the first table you have it 1,200 million kilowatt-hours for Echo Park. And then you drop down in your second table and for Echo Park again you have 666 million. And you wind up with a total deficit there, or I mean a plus, in favor of the alternative sites, of 181 million kilowatt-hours, when as a matter of fact you should have a minus of 353 million.

Mr. GRANT. No, sir. I cannot see that, sir. This arithmetic is perfectly correct, and the figures are the figures of the Reclamation Bureau. And that change occurs, as I understand it from their report, when Split Mountain Dam is brought in; there is a reduction in the amount of electric firm power to be gotten from the Echo Park Dam itself.

Senator WATKINS. Could Split Mountain injure in any way Echo Park's production?

Mr. GRANT. Well, I think it probably takes some of the head or something of that kind, sir. I can't explain the Reclamation Bureau's figures, except as I judge the cause is that the team together make more, but that there would be less electric power directly credited to the Echo Park Dam. Anyway, those are their figures, sir, not mine.

Senator WATKINS. Well, of course, the water has got to come out of Echo Park. If the water comes out, it can be used by the next project. They work very well together.

But I cannot see how that cuts down the production of Echo Park in any way to have Split Mountain.

Mr. GRANT. The Reclamation Bureau, sir, will probably be able to answer that better than I can. I merely give the explanation that occurred to me as probable.

Senator WATKINS. Well, don't you think you are mistaken in that? Don't you think you have given a misrepresentation, probably not intentional, but don't you think that is unfair, the comparison you make?

Mr. GRANT. No, sir, I think I have taken their figures and presented you with their figures and what they amount to.

Senator WATKINS. You got this 666 million kilowatt-hours from the Bureau of Reclamation report?

Mr. GRANT. Yes, sir.

Senator WATKINS. Did you ever make any investigation to find out just what that figure represented? As a matter of fact, I am advised that that would be 75 years from now; what might be out of there after the reservoir has been filled partly, probably, by silt.

Mr. GRANT. Well, there is a change that is recognized by the Bureau, and therefore in the final results of the second phase that seemed to be the proper figure to use. It may be that that is due to silting up in the reservoir or something of that sort.

Senator WATKINS. It shows that probably somewhere along the line there is a misunderstanding on your part as to just what the figures represent.

Now, in the first table, table 1, I am advised that 1,200 million is the initial production at Echo Park, and the 666 million are the ultimate, 75 years, say, from the time the plant goes into operation. That would make a vast difference.

Mr. GRANT. Yes, sir.

Senator WATKINS. So the other figures you use are, I think, for the initial. So you get an entirely erroneous and unfair picture when you make that kind of a comparison and use those figures.

Now, I call your attention to another thing, in connection with your report. On Echo Park cost, you have \$139,400,000, and then you take a comparison. Now, that figure, as I understand, is a 1950 cost estimate. And then you take the Bluff project, showing that this would actually cost less for the alternate sites, and you have \$19 million, down in your table 2, for Bluff. As a matter of fact, Bluff figures were taken from a report which used cost estimates based on the date of January 1, 1940. In other words, the Echo Park figures you took for construction costs would probably be two and a half times larger than the cost for Echo Park would have been in 1940 if you were going to make a fair comparison.

Mr. GRANT. Those figures are such as I could get from the Reclamation Bureau's studies soon after the public hearing, when this thing was being studied; in other words, about 1950, sir, I think.

Senator WATKINS. Let me call your attention to the figures I have just read to you, from House Document 419, 80th Congress, 1st session. This shows the cost of Bluff based on 1940 cost at \$19 million, and that is the figure you have used in your figure 2 to show the cost of Bluff.

I am not going through the whole table, but that shows, I think, what you will admit is rather an unfair comparison, to compare 1940 costs with 1950 costs.

Mr. GRANT. It is the only cost that I had, and I assumed that they were lined up. If they were not comparable, sir, that is not my fault entirely.

Senator WATKINS. Well, you should have indicated, I think, in fairness to this project, that your 19 million cost there was taken from a January 1, 1940, cost sheet.

Mr. GRANT. When I first presented these, sir, I did point out that there was a very great question in the cost figures, because I had not been able to find out what had been corrected and what had not been corrected up to date.

Senator WATKINS. Why didn't you do this? The Bureau of Reclamation serves all the people of the United States. They are public officials. I think you could have gone to them, could have gone to the Bureau here, the head offices of the Bureau of Reclamation here in Washington, and you could have gone to the Denver office, called in Mr. Larson, who has been in numerous times, and he could have helped you so that you could have gotten the figures to make a fair comparison. I take it for granted you never have talked to these people about it and asked for their figures; have you?

Mr. GRANT. I would like to make this statement, sir. After we had seen the Secretary in the summer of 1950 and pointed out that we believed these alternative sites were possible and usable, the Secretary said that he would ask the Bureau of Reclamation to give us all the information we wanted so that we could work on it with the Bureau, so that I could work with them on it. And he appointed Mr. Bennett to be the intermediary, Mr. Bennett being an employee of the Interior Department, in getting that information. I gave Mr. Bennett some questions as to especially the evaporation matters which had been

claimed at that time, and Mr. Dunn, in the Park Service, was assigned to give me what assistance from their standpoint was necessary.

We got no answer from the Reclamation Bureau, and there was no reply or response to the challenge that these figures gave, and finally Mr. Dunn went out to the regional office, and he did get some information from Mr. Larson.

Senator WATKINS. Who is Mr. Dunn?

Mr. GRANT. Mr. Dunn is an engineer in the Park Service, sir, an employee of the Interior Department.

Senator WATKINS. Did these gentlemen fix up this statement? The Park Service?

Mr. GRANT. No, sir. I fixed that statement.

Senator WATKINS. That is your own. I didn't know whether they had supplied you with the statement or not.

Mr. GRANT. No. I haven't asked anybody else to make my conclusions for me, sir. It was a matter of getting information, and I took the information from what I got in that way, because we had had no direct answer from the Bureau of Reclamation. I regretted very much this situation, that the Bureau did not respond to that offer; and since that time I took the liberty of telling Secretary McKay that I would be very glad to meet with them, if possible, to go over this matter so that there would not be any question one way or the other.

There has been no answer to that, sir. I could only conclude that the Bureau did not want to——

Senator WATKINS. There must have been some misunderstanding, because I have found that the Bureaus downtown, even though I have been opposed to some of their policies, have given me what information I asked for when it is available.

However, I am not questioning your word. You probably felt they were not willing to respond. But it seems to me that there is a discrepancy there, and a serious error in both instances, because either you were not supplied with sufficient information, or some errors crept into it. Because it is difficult to explain away where you have a plus 181 million kilowatt-hours in the alternate sites over the Echo Park combination, and actually it should have been a minus for that particular alternate of about 353 million kilowatt-hours. And that is in line with the testimony that the Corps of Engineers have given here; that we would get a greater power out of the combination with this Echo Park than with the alternates. That is in line with their testimony. I can understand how it occurred. You just did not have the fact that 666 million represented a 75-years-from-now figure of what would happen to the life of the project as time went on.

Mr. GRANT. Mr. Larson's statement says that the alternative would give 188,000 kilowatts annually less than with the Echo Park in. That is the last bit of evidence before this committee.

Senator WATKINS. But I am just taking your own figures here on the basis of what I figure here. We have a minus 353 million acre-feet when it comes to the alternate program.

Mr. GRANT. I think the point is so that there is a change in the amount of power you are going to get from the Echo Park Dam as the years go on, and I used the higher figure in the first phase.

Senator WATKINS. All the other figures in that second table on the alternate projects, I am advised, cover initial power productions only.

You take the 666,000 for the ultimate on Echo Park and compare it with the others for the initial production. Is that a fair comparison?

Mr. GRANT. They were the best figures I got, sir, from the official sources.

Senator WATKINS. Whatever it was, something slipped somewhere, because the comparison, I don't think is fair to the Echo Park project, and I do not think it can be sustained as a matter of engineering and mathematics.

I want to ask you one other question. You made quite a point that this is a violation of policy, in building Echo Park.

I wanted to call your attention to a proclamation of the President. There is something that has bothered me about that proclamation. It is a proclamation issued by Franklin D. Roosevelt enlarging Dinosaur Monument under date of July 20, 1938. It is the sixth paragraph down:

The Director of the National Park Service, under the direction of the Secretary of the Interior, shall have the supervision, management, and control of this monument as provided in the act of Congress entitled, "An Act to establish a National Park Service and for other purposes" approved August 25, 1916. And then it gives the citation. "And acts supplementary thereto or amendatory thereof; except that this reservation shall not affect the operation of the Federal Water Power Act of June 10, 1920, as amended, and the administration of the monument shall be subject to the reclamation withdrawal of October 17, 1904, for the Brown's Park Reservoir site in connection with the Green River project.

Now, there isn't any doubt but that they describe the Brown's Park Reservoir site in connection with the Green River project. That is definite. But we have this other language:

This reservation shall not affect the operation of the Federal Water Power Act of June 5, 1920.

That was in there for some purpose, and that wasn't necessary at all to bolster the Brown's Park Reservoir exception. Now, what do you think that means?

Mr. GRANT. Well, the Federal Power Act, sir, means that the Federal Power Act itself prohibits the granting of any permits in a national park or national monument.

Senator WATKINS. Well, the question was asked as to what was meant. I have seen the legislative history of that, and in light of that legislative history and possible interpretation, they put in there, "the Federal Water Power Act" for some purpose or other.

Mr. GRANT. I don't remember what the date of the proclamation was. What was that date?

Senator WATKINS. July 20, 1938.

The exception was, "affect the operation of the Federal Water Power Act."

Now, if they couldn't operate at all in there under the law, why mention it in this proclamation?

Mr. GRANT. Don't you think, sir, that that was put in in connection with the exemption of the Brown Park site, which had been already filed for, years before, and there was a vested right in it, and therefore in exempting it, it provides that it could be disposed of under the Federal Power Act? That is the only interpretation I can give it, sir, and I am not a lawyer.

Senator WATKINS. I think it meant exactly what the testimony shows, that the intention was clearly that they would go ahead with those reclamation projects. History shows that filings have been made at Echo Park. Utah Power & Light, as I recall, had filings at Echo Park. And the Federal Power Commission was loath to give them up; in fact, I don't think they ever did consent to giving up those filings, or have them withdrawn or set aside. So it seems to me that the language we have there properly interpreted certainly must have some meaning, and it isn't tied in so far as the language is concerned, with this Brown's Park Reservoir site.

It says:

except that this reservation shall not affect the operation of the Federal Water Power Act of June 10, 1920, as amended.

And then it goes on—

and the administration of the park shall be subject—
two different subjects there.

I call your attention to that. Do you think that is in line with Mr. Matson's very strong affidavit that he had been advised to hold meetings with the people and tell them that it would not interfere with the reclamation program, with the power program, with the grazing program? So I think it absolutely turns the situation around. What we have, in effect, here is an invasion of these reclamation projects by a national monument expanded by the President and the Secretary of the Interior after the projects had been proposed and work had been done on them. And the people themselves out there were completely deceived, because they didn't understand for a moment that the expansion would interfere in the slightest degree with the reclamation and power projects, because officials would proceed with the investigations. In fact they were permitted to make the checkups and investigations right down the line, until we finally got around to asking for executive and congressional approval, and then we got the protests from the conservationists and the planning association and others. But until that point no protests were made. We got nothing but cooperation in the expansive planning and investigative stages.

Of course, you and I could argue this out, and it probably would not do any good. But while you testify that it is violating a precedent and violating a policy, I want to point out to you that President Roosevelt apparently recognized a different policy. If you attempt to keep us out of there you are violating a reclamation area. The monument and reclamation project can go together. We are very happy to have it that way. In fact, if this bill passes, we are going to authorize \$21 million to make this beautiful canyon scenery available to millions of people who love nature and want to get out there. I include myself in that group.

We feel, instead of all this hue and cry, these emergency pamphlets sent out about an "invasion," we, on the other side, ought to be talking about an invasion by the park service of a reclamation already underway, an invasion which would prevent using one of our national resources. That is the other point of view.

Mr. GRANT. Yes. Of course, our feeling was that this very unique scenic area, with a special type of recreation facilities, had been set aside, was a part of the Park Service, and had been protected that way,

and that the exemption applied to the Brown's Park site which had a vested right established already at the time the proclamation was made. So that was our understanding under which, I think, most of the conservation associations have felt that it very definitely will set a precedent, which, after all, is a fact.

It merely gives the entering wedge to putting this kind of thing in.

Senator WATKINS. If it is just a matter of principle, Brown's Park was already in the monument area.

Mr. GRANT. That is on the upper edge, and that part could have been taken out of the monument without doing the monument any harm, and that is why the exemption was made.

Senator WATKINS. The principle is the same, is it not?

Mr. GRANT. I think, sir, that slight changes in boundaries are made and can be made frequently enough.

Senator WATKINS. That is about 11 percent of the monument area, is it not? Brown's Park would have taken about 11 percent? Or Echo Park alone. I misspoke myself. Echo Park alone will take only about 11 percent of the monument area will it not?

Mr. GRANT. It would have taken the heart.

Senator WATKINS. The heart started out with the bones at the monument quarry.

Mr. GRANT. The bones were not in the lakes, sir. The bones are not affected, I believe, and we all recognized that.

I think that is just the strawman that has been put up.

Senator WATKINS. That was the base from which someone very cleverly pushed the expansion of the Dinosaur Monument to include all this area. That was the springboard they used. But I don't think they ought to be permitted to abandon the springboard now. That was the excuse for doing something further and expanding it.

Mr. GRANT. The proposed project does not affect the Dinosaur deposits.

Senator WATKINS. Neither Echo nor Split Mountain?

Mr. GRANT. As I understand it, neither of them.

Senator WATKINS. General, what are the criteria that should govern the selection of a national monument?

Mr. GRANT. Well, I can't quote the act, but I think that act must be in the hands of the committee, and, the site having been set aside after study and considered to be sufficiently remarkable and unique for preservation as a part of the national heritage, then we are, of course, interested in its preservation in accordance with the National Park Service Act of 1916.

Senator WATKINS. No. 1, one of the qualifications or one of the criteria would be that it would have to be unique, would it not?

Mr. GRANT. Well, it has to have something of, let us say, national importance and character. I think everybody must recognize that you can't set aside all the fine scenery and all the fine and interesting parts of the country. But certain ones are picked out for preservation.

Senator WATKINS. As I understand it, that first one has to be unique, with nothing else like it.

Second, it ought to be in the nature of a shrine.

And third, it ought not to contain land and mineral resources and other resources needed.

Now, as I understand it, the selection of the 200,000 acres and expansion up there broke all the rules with respect to the selection of a national monument. It is not unique. We have hundreds and hundreds of miles of canyon just as deep or deeper than Echo Park. There is nothing in the nature of a shrine there. And it does contain resources, one of the great resources of the intermountain region, Colorado, Wyoming, Utah, and New Mexico, a site that would make it possible for them to develop their resources.

Mr. GRANT. There are others here, Senator, who by personal visit there can speak more worthily and meritoriously than I can as to the characteristics. But all the experts and persons from whom I have been able to get an opinion have agreed that this is a very special scenic and inspirational place, and that it contains possibilities of a unique kind of recreation that you can't get anywhere else.

Senator WATKINS. What kind? Just be specific about that. What particular type of recreation can you get there that you can't get anywhere else?

Mr. GRANT. Well, I think sailing down through these canyons, with tremendous vertical walls, is one kind; and camping and stopping there overnight on different parts of the canyons is perhaps something that is not repeated any other places. And, anyway, this one is the one that was selected to be set aside and has been set aside. The others have not. And why not use the others, as I have suggested?

Senator WATKINS. Well, for instance, in the United States you have the Salmon River, I am informed, in Idaho, and other streams, where you can duplicate plenty of wilderness, rough rugged rapids, to shoot to your heart's content. But this is not the only place in the United States and not the only place in the West where it can be done. There are other places even on the Colorado where you can find high canyon walls. They are not in any monument or reclamation project and not likely to be there.

Mr. GRANT. As I say, others are better qualified to answer that question than I am.

Senator WATKINS. Well, I assume you are qualified to give an opinion the other way. I want to test how much weight we should give to your opinion. That, of course, is one of the jobs that the committee is unfortunately saddled with, to determine from all of the conflicting evidence that we get here what are the facts.

Mr. GRANT. Well, I have seen a number of canyons in the West in different places, and from the very complete illustration of these canyons that I have not been able to visit in the last two summers since this thing came up, they seem to me to be very special in their quality. And such advice as I could get on that from other persons confirms that opinion.

But what I am particularly interested in, sir, is the features of the project and the fact that the Echo Park Dam is really not necessary there. That I feel more competent to speak of.

Now, I did mention yesterday that the Joint Engineers Council had made a report on the economic justification, which is before your committee, and that the Chief of Engineers had a report, which was before your committee, and the Senator read a recent letter from

General Sturgis which indicated that in his opinion the Echo Park Dam and the Glen Canyon Dam, those two together, were justified. But that did not vitiate or contradict some of the subjects brought up in the original letter of July 1951, and I think it is only fair to put in this paragraph in that letter, if I may read it.

Senator WATKINS. One of the attachés of the committee, here, has given me this pamphlet, a little brochure put out by the Upper Colorado River Commission. I want you to take a look at that.

Mr. GRANT. The letter of the Chief of Engineers of July 3, 1951, contains this paragraph, and I won't try to read the whole report:

With respect to the economic justification of the individual units, there is no information in the report which would enable a check on the evaluation of benefits from irrigation projects. A study of the individual reports on the participating projects which you have furnished appears to reveal questionable methods of economic analysis of secondary benefits. Although the benefit-cost ratios of these participating projects are shown to be in excess of unity, data to support these ratios are missing both from the main report and from the individual project reports. However, the principle stated to be the basis for compensation of benefits is not believed to represent an accurate approach to such analyses. The inclusion of relatively large secondary benefits on the theory that the handling and processing of agricultural goods and increase in associated goods and services are of benefit to the irrigation project to the extent reflected in your analysis is not concurred in.

And so forth.

The report is before your committee. I don't want to take your time reading it, sir, but I did want to bring up the fact that I think it merits attention.

Now, did you wish me to read this?

Senator WATKINS. Yes. Have you seen that little brochure before?

Mr. GRANT. No, sir; I haven't seen this one. I have seen several that have been sent to me.

Senator WATKINS. Those pamphlets are available to all interested persons and you are welcome to that one. Others will be made part of the file for the information of the committee.

Mr. GRANT. I will read it with great interest, I assure you, sir.

Senator WATKINS. You can keep that one and I will put another one in the record. I want to ask you some questions about it.

I call your attention to the inside page, Answers to Ten Questions Frequently Asked. There is an illustration, a photograph, apparently touched up by the artist, to locate the dam in the river canyon. Do you observe that?

Mr. GRANT. Yes, sir.

Senator WATKINS. You have never been there, have you?

Mr. GRANT. No, sir; I haven't been there.

Senator WATKINS. Now, just opposite that photograph, you have a cross section of Whirlpool Canyon. This shows how small a portion of the canyon the dam will actually occupy.

You notice the drawing to indicate that?

Mr. GRANT. Yes, sir. It indicates, however, that the really vertical and tremendously impressive part of the walls is flooded out.

Also, as far as I can tell from measuring up that figure, the vertical element seems to be somewhat exaggerated as compared with the horizontal, so that I don't think it gives you an entirely fair picture.

But I haven't been able to find any accurate data which permits me to go further than that. But I think that the vertical—and it is quite

a usual thing to do in cross sections and engineering work—to exaggerate the vertical a little bit and use a little different scale on the vertical from the horizontal.

Senator WATKINS. You wouldn't say they had exaggerated the vertical here. You would say they had played it down, wouldn't you?

Mr. GRANT. No, sir, I think they have exaggerated the vertical so that the upper part there seems narrower than it really is.

Senator WATKINS. You mean up at the elevation, for instance, on Wild Mountain, 7,975?

Mr. GRANT. Yes, sir. I think that probably if you used the same scale vertically and horizontally, that would widen out the picture quite a little bit, sir. But that is the best I can do by measuring with a ruler on these very inadequate little diagrams.

Senator WATKINS. Well, it seems to be adequate to illustrate the situation there, the stored water as compared with the overall depth of the canyon.

Mr. GRANT. I think it gives a little exaggerated idea, though, sir.

Senator WATKINS. I don't know whether it does or not but for the purpose of the record we will order this particular brochure filed, with enough copies for each member of the committee, with the possibility that we may have it made part of the record, at least that part which can be reproduced.

Have you finished or have you more to add, General?

Mr. GRANT. I have nothing more to add, excepting that I would like to read my last paragraph, sir, unless you want to go into the evaporation matter, as you suggested yesterday. But I think that a full description of the steps necessary to properly measure or foretell the evaporation of a lake that does not exist might take more time than the committee wants to give.

And I think it might take about 25 pages to explain, sir, in type-writing. And maybe if you would like, I can submit that in writing.

Senator WATKINS. I was interrupted just for a moment, and I didn't catch that last statement.

Mr. GRANT. Yesterday the Senator asked me to give a description, when I got through, of the evaporation, of how the evaporation should be measured to be foretold in a dam in a reservoir that does not exist yet. And, as I say, that is a fairly complicated thing to explain in a few words. I think you are in a hurry to get this hearing through, sir, and if I may, I will try to summarize that and send it in, in the course of a couple of weeks. It is going to take time.

Senator WATKINS. Would you like to try right now?

Mr. GRANT. Well, I can try, yes, sir, if you want to take the time.

Senator WATKINS. Well, you can give us a brief description of the method, can you not, for determining evaporation? At least, the one that you used in connection with this statement?

Mr. GRANT. I will try to put it in as few words as possible, sir.

First of all, I have to start with the fact that on August 6, 1950, the Secretary of the Interior issued an information bulletin telling about the establishment of the Lake Hefner Laboratory to study this evaporation question. Research, as he says, into a comparatively little known but important phase of water resources development, evaporation from reservoirs. And then he goes on to say that this is an old hydrologic mystery; and the Bureau of Reclamation engineers must

know exactly what losses by evaporation are likely to occur before they take a dam past the investigating stage. And then he says that the survey to determine this loss rate on a scientific basis was requested by the Commissioner, Michael W. Straus, of the Bureau of Reclamation; so that in August 1950, after the 350,000 acre-foot evaporation figure had been claimed against the alternative sites, Mr. Straus himself asked for this investigation, which is really turning out to be a great contribution to hydrological—not only theory, but scientific methods of getting at the evaporation factor.

Senator WATKINS. General, are you getting to the point now of explaining how it is done?

Mr. GRANT. Yes, sir, I merely wanted to bring out those points from the Secretary's statements.

Now, the evaporation evidently comes from three factors or more, and the evaporation amounts to the estimated lake evaporation rate, which is equal to the measured pan evaporation rate.

Senator WATKINS. What was that? I did not get the word.

Mr. GRANT. Pan evaporation rate. This is the practical way of going at it. I may say there are two or three theoretical methods that are rather academic, but since they were not used in this case, but the whole thing was based on six pan evaporation records of the Geological Survey, I think I will limit my remarks to that method.

So the estimated lake evaporation rate is the measured pan evaporation rate multiplied by a coefficient which gives the relative difference between the pan measurements and the actual evaporation on the lake. And that is multiplied again by the surface area of the lake. And every one of those elements is a variable. None of them are permanent fixed quantities. So that necessarily the estimated lake evaporation rate must be a variable to some extent, too, and there is some uncertainty about it.

Senator WATKINS. Well, the temperature, wind velocity, exposure, and humidity, that you mentioned previously, are all involved, are they not?

Mr. GRANT. They are all involved. The temperature of the pan water is very nearly equal to the temperature of the air, but the temperature of the lake water is in general very different from the temperature of the air, and this is the direct cause for this coefficient between the pan and the actual evaporation from the lake; and the perimeter and the condition of the edge of the lake and the conditions that exist there, of shade or lack of shade, and so forth, enter into it. And then the lip of the pan itself creates a turbulence in the air which is different from the turbulence created by the terrain in the vicinity of the lake, the effect being an ill-defined one.

Then if we go on to what would be necessary, therefore, to arrive at reasonably fair evaporation forecasts, you would have to have not one pan at the lake site, but you would have to have six or seven scattered around different parts of the site to take pan evaporation measurements. Then you have to have observations of temperature and observations of wind and wind direction for a considerable time in order to have basic facts to work with. And then you have to arrive at this coefficient to apply to the pan evaporation, which would be correct for that particular lake. And this is not making the statement scientifically at all, Senator. It is trying to eliminate all possible quirks and peculiar things about the program.

Senator WATKINS. I recognize the process from the way you describe it. I had an occasion one time as an attorney involved with a reclamation project to see the process in operation. I could not describe it, but I recognized the process from which you have set about it, and I assume that you yourself have conducted evaporation tests. Have you?

Mr. GRANT. Well, I have had occasion to have them conducted for me, sir. I have not actually made the pan measurements myself.

Senator WATKINS. That is what I had. I had this done for me.

Mr. GRANT. So the main point I make in regard to the evaporation figures presented by the Bureau of Reclamation is that they were based on only something like six pan observation stations, and those not at the reservoir sites, and that as far as I know they have no very, let us say, scientific observations on the temperature and the wind and wind directions and those things.

Then, as I say, another variable enters into it: since these surfaces are the surfaces not of the same area all the time, but since you are taking out water and putting it in, the surface is varying, too. And therefore the limit of error, let us say, or the limit within which the results are at all reliable, is perhaps 25 or 30 percent at the best. And I want to point out that there has been going on since 1950 this very interesting study and research project at Lake Hefner, which is almost a perfect site for it; and the results are shown. There is more variation, more question, about the results that would be obtained, in trying to foretell the evaporation on a lake which not yet exists, from some assemblage of the facts that I have spoken of. There is more variation and unreliability in that than you would have expected.

Senator WATKINS. Well, now, one final question. Is it not true that the error in calculation of the evaporation was at Glen Canyon, on the High Glen Canyon Dam proposal, and not at Echo Park?

Mr. GRANT. Well, one error was at Glen Canyon, one which was pointed out, where I think they started, in Mr. Tudor's first statement, with 165,000 acre-feet loss, and it finally was brought down to 25,000 acre-feet loss. And that was the error found in that particular project.

Senator WATKINS. That was with reference to the High Glen Canyon Dam?

Mr. GRANT. Yes, sir. Now, in the other places, again I took the evaporation that the Reclamation Bureau had given, but I questioned it when they said there would be 350,000 acre-feet more evaporation if they used the substitutes. I certainly questioned that.

Senator WATKINS. You mean the alternates?

Mr. GRANT. Yes, sir. And I went into it, and I think I proved conclusively that that was a mistake, and that it could not be more than about somewhere around between 100 and 150 acre-feet, which they finally adopted.

Senator WATKINS. Would you stand on 150 as the difference? 150,000, I take it you mean.

Mr. GRANT. No, sir, I don't think I would. Because the more I have gone into it, the more I question the basic figures that were used. Those figures are just a sort of an educated guess. They have taken the pan evaporations, as I say, which are not at the sites, not adequate observational data, and I think that the whole evaporation effort—

I think they used the best information they had, but I don't think they are reliable, if you are going to make that the test.

Senator WATKINS. I call your attention to a press release made by the Secretary of the Interior, in which he said, as the paper quoted him, that research at Lake Hefner and Lake Mead indicated the accuracy of prior estimates of evaporation made by Bureau of Reclamation engineers. Would you care to question that?

Mr. GRANT. I don't like to take issue with the Secretary of the Interior.

Senator WATKINS. How recently have you checked with Lake Hefner and the experiments at Lake Mead, the studies that are being made? How recently have you checked with them? Or have you ever checked with them?

Mr. GRANT. I have not checked personally, sir, because, after all, as I say, I have no staff. I have no facilities for doing these things. I am just a poor citizen trying to help the committee by bringing out some facts. But I have a study that has been made by a research associate in physics, who is a doctor of philosophy, and I helped him to the information in regard to Lake Hefner, and the results of his analysis or study are rather different from the Secretary's impression. So that I think the Secretary has again been informed by the Reclamation Bureau, who, of course, are interested in supporting their own data.

Senator WATKINS. Well, you are somewhat interested in getting information to the contrary, are you not?

Mr. GRANT. Not if it is wrong, sir.

Senator WATKINS. What is that?

Mr. GRANT. Not if it is wrong. Not if I am mistaken.

Senator WATKINS. I rather gather from what you said that you thought because they were interested they might try to find figures to support their position.

Mr. GRANT. I think it is more or less human.

Senator WATKINS. Well, you are interested on the other side, are you not?

Mr. GRANT. I do not think I have the same kind of—

Senator WATKINS. I have not suggested in any way that you have hunted for figures to sustain your position, but since you said that about the Bureau, I think it would be a fair question to ask you about yours.

Mr. GRANT. I don't think that I am perhaps interested in the same way, sir, because I am not going to get \$5 billion authorized if this bill goes through to do a job. And it is not my project, and having studied the project and their reports I have come to the conclusion that the overall project would be very much improved by being revised; that it will not do any harm to omit the Echo Park Dam; that you will have the water and power that you need in the upper States, and which we would like to see you have, without the Echo Park Dam, and you will be saving a part of the Nation's heritage which ought to be saved.

Senator WATKINS. As I get the net effect of what you are saying, it is that you, without a staff of engineers, give us your judgment, and that we have to balance it against the judgment of a large staff of engineers who are held responsible for the investigation of a mam-

moth project. Many of them have spent many years on it. Studies have gone on for I don't know how many years, but it has been a long time, on this particular project. And they have come up, after checking and rechecking on it, with the statement that the Echo Park is one of the key dams; that to have it makes more effective than Flaming Gorge, Cross Mountain, Split Canyon, and other dams on the river. It is one of the best regulating reservoirs on the river, and it is high enough to be near the power market center as far as the upper basin is concerned, and it has numerous power advantages. Then, without any staff, you make that judgment, as against a group of men who have a responsibility for doing a good job. And they know if they fail on a deal of this kind their reputation as engineers is ruined. That is what the committee has before it.

We have great respect for you, General. You have a very distinguished record. But we are required to take your opinion as against the opinions of able Bureau of Reclamation engineers who have checked and rechecked the facts they gathered in the field and have given their expert opinions on the feasibility of this basin project.

Mr. GRANT. My opinion, I humbly submit, is only an analysis of their report, and it is not an original study in which I have undertaken to go out and locate new sites or even criticize the ones they have reported. They may find that some of those dam sites can't be used because of geological reasons or foundation reasons or something of that kind. And I think the main point is that they have not gotten that information yet to give to you, because in his own statement Mr. Larson says that the Glen Canyon Dam may be higher or lower than they have talked about, because further study and investigation is necessary to decide how high it should be and can be.

Senator WATKINS. I think we have covered the field pretty well. Thank you very much. We appreciate having you here.

Mr. David R. Brower?

STATEMENT OF DAVID R. BROWER, EXECUTIVE DIRECTOR OF THE SIERRA CLUB

Mr. BROWER. First I wish to thank the committee for this opportunity to appear.

My name is David R. Brower. I represent the Sierra Club, a national conservation organization of 8,000 members, of which I am executive director, and in which I have been active for 20 years. I also speak on behalf of the Federation of Western Outdoor Clubs, a regional organization of 31 separate clubs in California, Oregon, Washington, and Utah whose membership totals 21,000 and includes the Sierra Club. For further details on these organizations and their views as previously expressed I would refer you to testimony beginning on pages 789, 797, 824 of the published hearings on the upper Colorado project held before the House Subcommittee on Irrigation and Reclamation last January. I shall not repeat here my earlier testimony.

For 62 years the Sierra Club has been striving to play the role envisioned for it by John Muir, one of the Nation's greatest conservationists, who was the club's president for its first 22 years. The

club's successes—and there have been many—have been due to the devotion and the labors, selflessly volunteered, of many thousands of individuals through these six decades. You would recognize the names of many of them. Like most conservation organizations, this one has many experts and professional men in almost any field you can name, some of whom have received the highest honors their peers can bestow. Membership has included presidents of great universities, of a railroad, of a mining concern, of several scientific societies of the National Reclamation Association; top men in electronics, engineering, hydrology, geology, economics, law, and finance; Members of the Congress and of a State legislature; a justice of a State supreme court; four directors of the National Park Service, the previous Republican Secretary of the Interior; great teachers and great writers; All-American football players, outstanding mountaineers and skiers. And a host of people whose names may never get in the papers at all.

What do they have in common? A certain kind of humility in the presence of the natural beauty in the outdoor world. They have joined together to enjoy for themselves some of the finest scenery in the country, and to try to make sure, for the sake of their sons and yours, that man should not endeavor to scratch his name over the entire face of the land, but that man should instead leave some of the land unmarred, unaltered, and unimpaired that we might always know with what skill and artistry God made the earth, unaided by man.

The board of directors of the Sierra Club, drawing upon the wide scope of knowledge within the membership, and after careful study, has taken this stand, and no member of the club has protested it: The Sierra Club has no objection to a sound upper Colorado River storage project that does not impair the national park and wilderness system.

Our national parks, monuments, and wilderness are a priceless asset. They are the fruition of 90 years of prodigious effort on the part of men of great vision. I need not sing the praises of our enviable national park system before Congress because it was Congress which established the National Park Service in 1916 and which has steadily improved and protected the system ever since.

I am well assured of your appreciation of the national park system. Yet I am not sure that those people who are in the best position to know have presented to you the importance of Dinosaur National Monument to that system.

Words won't do it. Pictures won't do it very well. One of our printers commented, "We've seen a lot of pictures of Dinosaur, and I thought that you had probably shown all there was to see." This man had also seen two-color motion pictures of boat trips down the canyons. "But I just wasn't prepared for what I saw," he told me. It just keeps unfolding and unfolding, always different. I rode with a different boatman every day, and each one told me, "Today's the best of all." It's the most gorgeous place I've ever seen."

The printer and his wife were on the first Sierra Club trip this year—the first of 5, which traveled across the monument from east to west—86 miles of floating from Lily Park through Split Mountain Gorge.

My secretary went on that trip, too. For more than a year she had been seeing letters, pictures, clippings, and articles about Dinosaur,

as well as the two movies. She has seen very few parks and I'm not sure she had ever camped out before. She wanted to try the river trip and off she went. "But I'm going to walk around those rapids," she told me. She is one of those blonds who tan beautifully, and she came back a week ago Monday from the 6-day trip, beautifully tanned. Ask her about that trip, and all you get is a rapturous sigh. It was the best trip she had ever had, anywhere. And did she walk around the rapids? Not one. She helped the boatman row through some of them.

When there wasn't enough splash from rapids, the 10-boat flotilla with some 70 people aboard, got into water fights to keep things lively. You can splash quite a lot of water on someone if you use an oar or a baling can right. Helping in the battle, with their dignity pleasantly relaxed were one of the Nation's foremost physicists and an assistant United States attorney general.

The physicist had his 4-year-old daughter along. She helped, too. And so did the leader of the trip—who is a great-grandfather.

Two of my boys and I wish this hearing could have been held in May. We should then have been able to take the river trip again ourselves. As it is, we'll wait until next year. Once isn't enough by any means. Six days only serves to tantalize you, to show you 20 new places you would like to camp in and explore. I'm using the word "you" in a general sense; it probably covers everyone in this room who has any liking at all for the outdoors and who doesn't mind sleeping out in the open.

It doesn't break you, either. This year the nearly 300 people from all over the country who are taking the Sierra Club's nonprofit trip are paying \$65 for 6 days on the river, including boats, boatmen, leadership, food, and a small crew to do most of the cooking and pot walloping.

Is it hazardous? Without proper precautions you can get into trouble, and not just on a river. Even in a bathtub. I would say the greatest hazard is driving to Vernal, Utah, the jumping-off point. One man from Vernal, who I am not sure has been down the river, alternates between saying a corpse could make the trip and you may be a corpse if you try. Having been through once I know I would hesitate to go through the monument in a boat of my own until I had learned more about river running, but I wouldn't hesitate to go on an organized trip with skilled boatmen along. Likewise, I would hesitate to take a horse into national-park back country until I knew more about horses. Once you yourself step into one of Bus Hatch's rubber boats and let one of his boatmen take you down the Yampa or the Green, you'll not be worried again over alarmist claims about the river hazards in Dinosaur. I think there is still room for a few on the July 15 trip that goes through the Canyon of Lodore if somehow you can arrange to hang the "Gone fishing" sign on your door. In that canyon there are rapids which nearly everybody must walk around. But it is a short, easy, scenic walk.

Yes, I am sure that once you have gone through you will well understand why hundreds of people who have been through consider entirely wrong the claim that a dam would enhance this place. It would do to Dinosaur what a dam would do to Yosemite Valley—destroy the best of the valley itself, and do untold damage to the effect of Yosemite National Park as a whole as well as to the national park

idea. As the National Park Service itself has said, the effects of the dam would be deplorable.

It seems to us well worth extremely great effort to find a way to preserve and enjoy Dinosaur just as it is, unaltered and unimpaired. We have only begun to see how much it can mean to the Nation as a primeval national park, one of the finest units in all the system, unexcelled by any canyon park.

The Sierra Club, with its own limited means of bringing the Dinosaur River trips to public attention, has encouraged a good 500 people to see Dinosaur for themselves on club-organized trips. It will be 32 years before all our membership goes through at this rate, and by then there will be a new generation on deck. It is worth bearing in mind that 300 people who take a 6-day river trip are getting as many man-hours of enjoyment as about 40,000 people who take the short dusty ride from Highway 40 to the hot little museum and quarry to look at the Dinosaur bones.

Isn't it worth exploring how much this unique and enjoyable canyon travel can expand without damaging the place? What would the potential be, for example, if other groups arranged trips like the Sierra Club's? What would happen, too, if the Chamber of Commerce in Vernal, the natural gateway to the wild beauty of the Dinosaur canyons, were to start encouraging transcontinental travelers to pause for a good trip to or down the canyons?

With good business administration, an expanded boat concession in Dinosaur probably has a potential something like this. Two 8-boat flotillas could leave daily from Lily Park and Gates of Lodore for 6-day trips, using staggering campsites for an average of 2½ months each. Some of the trips might travel longer per day and get through sooner: other trips might take longer. Shorter trips would be available, such as Gates of Lodore to Echo Park, Echo Park to Island Park, and Rainbow Park through Split Mountain Gorge. We can, to arrive at a potential, assume two a day of each of these short trips, of a full or part day's duration, running simultaneously and with the same capacity.

By this schedule, about 900 people would put in every day—plus 96 boatmen, plus self-sufficient river runners who could stand the traffic.

Twenty campsites would be occupied each night, and about that many trucks and buses would be busy shuttling boats and people to the starting points.

About 70,000 persons could thus see parts of Dinosaur from the river each summer season, perhaps spending about \$10 per day for transportation and meals on the river, plus whatever they needed to spend for goods and services in Vernal, or in a separate gateway settlement established to encourage people to see Dinosaur.

The Dinosaur quarry could be made very attractive. There could be further travel by way of an improved loop road taking in Castle and Echo Parks and Harper's Corner, with overnight accommodations for visitors interested in the less enticing bench country back from the rivers' banks, or wishing to explore riding and hiking trails.

Thus the man-days of use per year might eventually number several hundred thousand and the natural qualities of Dinosaur National Monument would be continuously sought out for their unique beauty by national-park travelers.

Let me emphasize that this is a theoretical potential use of Dinosaur's recreation possibilities as a natural national park. It may never get that high.

Senator WATKINS. It has not up to date. That is true, is it not?

Mr. BROWER. That is true.

I myself feel that there are other values to national parks than those measured by counting the crowds who pass by. The head count puts the emphasis on quantity, and is too likely to overlook the qualitative experience national parks can and should provide. It is not getting to the bottom of the issue to say that one area is good because 2 million people pass by each year and another area is useless because only 20,000 people see it. I think that it is the recreative, inspirational values that we must consider here, and that have been considered well by those who have set up and protected the national park system.

If, however, the Echo Park Reservoir replaces the wild canyon rivers, Dinosaur could not be expected to be the mecca for reservoir recreation predicted by those who would flood its canyons. Its national park qualities would have vanished. It would be one more reservoir in an upper basin project calling for 700 miles of new reservoirs to add to the Nation's existing hundreds of miles of reservoirs. In summer it would be a hot and glaring lake with no attractive woods growing at its fluctuating water lines. Vast areas of denuded landscape would be exposed year after year.

The reservoir might fill once or twice in 40 years, and all its active storage might be drawn down as often. The intermittently drowned and desiccated vegetation would be no attraction. The rapid encroachment of silt, exposed in varying amounts according to draw-down, would repel travel in the upper reaches and in the embayments. If history of other reservoirs is a fair criterion, there would be a momentary improvement of fishing, then a steady decline. Its summer upland temperatures would be hot, its glare unrelieved; its winter climate would be too severe. It is not in the climatic zone that can bring large numbers of travelers past Lake Mead the year around.

Not in our time, of course, but in due time and depending upon whose sedimentation scale we rely upon, this reservoir, and all the beauty inundated, would completely silt up. The top 200 feet of Steamboat Rock's crown would be the tombstone for a park that need not have died.

These estimates have solid basis in three examples which we ought to head.

Lake Mead. Prior to construction of Hoover Dam and formation of Lake Mead, this region was not a public attraction. The scenery is spectacular and tremendous in expanse but no single natural feature or group of natural features was given national attention.

Total travel to Lake Mead national recreation area for 1953 was 2,220,940 persons.

Approximately 300 people a year take the all-day scenic boat trip. Approximately 4,500 people a year take the 1-hour boat trip on the lake. Approximately 500 people a year take a 3-hour scenic boat trip.

The fluctuation hampers recreation use of the lake to a very marked degree and adds tremendously to the cost of maintaining boat docks, boat launching facilities, sanitation along the shore, swimming facili-

ties, and many other public-use facilities, including safety and navigation aids.

Siltation has made it necessary to abandon all lake shore facilities at Pierce Ferry, once a popular harbor. Extreme low water at Overton and Las Vegas Wash this season will either close these harbors or require over a mile of new roads construction each to keep them usable. Silt at Overton may close the harbor until high water again occurs, perhaps 2 years from now. Obviously, reservoir recreation provides for a real if different need. There is great opportunity for it now and the opportunity will increase. It need not and should not increase at the expense of parks.

Hetch Hetchy. In Yosemite National Park we learned a costly lesson, and once is too often. Back in 1911—there was no National Park Service to protect an irreplaceable scenic valley. And proponents of Hetch Hetchy Dam were claiming:

San Francisco will wither without this water.

We must have this cheap power.

There are no good alternatives.

The scenery will be enhanced.

Greater accessibility will result.

Nature lovers are obstructing progress.

California's land must be used for California's benefit.

In 1954—we know better, too late. Not one of these claims proved valid. Yet we are now hearing parallel claims for Echo Park. We are still not faced with a choice between the water and scenery; sound planning will conserve both.

We know that our superb and enviable National Park Service is not an accident. Men of vision have been building it for 90 years. Ninety years from now the need for parks will be greater. And posterity deserves the best, not the dregs, of the things that make America beautiful. They and we can have them if we keep our vision clear and remember, with former Interior Secretary John Britton Payne:

There is a heap more in this world than three meals a day.

Hetch Hetchy was not quite so beautiful as its neighbor, Yosemite Valley, but it had much of Yosemite's charm and living space—great oaks, verdant meadows, tree-framed waterfalls, and one of the finest streams in all the Sierra Nevada. Kolano Rock was one of the handsome landmarks under which hundreds of thousands might have camped in these days of overcrowding in our parks.

But Hetch Hetchy had a good dam site. True, others existed downstream—and still exist today—and the water would flow down to them, for diversion to a distant, growing city. Hetch Hetchy, though, was at a higher elevation, and the greater height could produce a little more power. A great battle wages, but there was not yet a National Park Service, and conservation organizations were few. As James D. Phelan wrote in 1911, espousing the dam in this valley:

* * * its beauty will be enhanced * * * making the valley more sightly and accessible * * *. There can be no question but that the beauty of the scene, with a dam easily concealed by grasses and vines, will be enhanced by the effect of the lake reflecting all above it and about it and will be in itself a great and attractive natural object.

At that point I would like to refer you to the picture just ahead of the center spread of what Hetch Hetchy Reservoir is now. I took that picture. I will point out that that is not at extreme low water nor does that follow an abnormally dry year. This is just 2 years, interspersed by a mild year, a normal year, after the greatest rainfall on record. And that is the lake.

The valley was made more accessible, but now for every million who come to Yosemite Valley to stay, a mere thousand come to Hetch Hetchy Reservoir to turn around and leave.

Just as in Dinosaur, it was not necessary in Hetch Hetchy to choose between water or scenery. Water flows downhill, and there were and there still are sites for storage reservoirs from which waters of the Tuolumne could be diverted to San Francisco. A lower diversion point meant a lower power head, but this was not at issue, and there is indication that San Francisco would have been better off financially had it not gone to the added expense of going high for power. Certainly there were alternate sources of power then, and thermal-generated steam is the predominant power source in California now, even with many streams still undeveloped.

Former San Francisco Mayor Phelan, writing in *Out West* magazine in 1911, went so far as to imply that the Hetch Hetchy invasion would supply water not only for San Francisco, but East Bay cities as well, east of San Francisco Bay.

His crystal ball was clouded. Starting years after San Francisco, the East Bay Municipal Utility District kept out of the National Park system, developed its water two streams north—on the Mokelumne River—and completed its project and was exporting water to San Francisco before Hetch Hetchy water could reach San Francisco mains.

One cannot say for certain what the full recreational potential of Hetch Hetchy Reservoir may be. In spite of provisions of the Raker Act, the area is operated somewhat as a private lake. Even so, the setting is obliterated, the fishing is not good, and there is no place to camp. Seventeen years after the addition of 85 feet to the dam, there is still construction clutter around the dam, which is not concealed by grasses and vines. There is no possibility of enjoying the type of human experience national parks were set aside to perpetuate.

Today, were it unimpaired, Hetch Hetchy Valley would be carrying part of Yosemite Valley's overload, and be enjoyed for itself, too, while those who preferred the real values of reservoir recreation were dispersing themselves upon the many available reservoirs. Instead, San Francisco's gain, probably at an inordinate financial burden, became the Nation's loss—a loss that is constantly increasing as the progress of our culture brings more population, more leisure, and more of the strains that national-park recreation helps so wonderfully to ease.

Mr. Phelan, troubled by the application of the word "vandalism" to those who would invade Hetch Hetchy, commented that "people who have a bad case use harsh words." In the cold light of hindsight, we can now see whose was the bad case—and remember that the kindest term the "vandals" had for the opposition was "nature lover." The term, now being called forth again for its overtones of derision, served then, as now, more to becloud than to clarify. Those who felt

a reverence toward their natural heritage also seem to have been in closer touch with logic, their insight free of myopia. Their crystal ball, we now know, was clear.

If we heed the lesson learned from the tragedy of the misplaced dam in Hetch Hetchy, we can prevent a far more disastrous stumble in Dinosaur National Monument.

Yellowstone, for a third example. A threat like that to Hetch Hetchy and Dinosaur was staved off in 1921 in Yellowstone National Park. Dam proponents were then urging a project to raise Yellowstone Lake 6 feet. It would help the park, they said, increasing the size and beauty of Yellowstone Falls. Arguments that it would create a dangerous precedent they tried to dismiss as visionary and sentimental.

Defenders of the new national park system, however, prevailed. They revealed the project's incompetency to accomplish the results claimed for it. Former Secretary of the Interior John Barton Payne pointed out:

The water does not stay in the park. Use it outside.

To the Senate Committee on Irrigation Mr. Payne said:

Once you establish the principle that you can encroach on a national park for irrigation or water power, you commence a process which will end only in the commercialization of them all.

When asked if he realized that this bill called for a dam only 6 feet high, he predicted that it would soon be followed by a bill asking permission to raise the dam to 25 feet. "And the fight to get that," he stated, "will be just as insistent as the fight now to get 6 feet."

It was for this committee that he summed up the case of park protection with the remark, "There's a heap more in this world than three meals a day."

The threat to Yellowstone resulted in passage of the Jones-Esch bill rescuing national parks and monuments from the application of the Water Power Act—a protection broadened by a 1936 amendment and cited in the proclamation enlarging Dinosaur National Monument to its present magnificent scope.

In summary, in Hetch Hetchy there was no National Park Service and the national park system lost.

In Yellowstone the Department of the Interior stood behind the Park Service and the parks gained protection.

In Dinosaur the issues are in essence the same. But the National Park Service cannot speak. Protection of the park system is thus up to the people, who own it, and their Congress. Eternal vigilance is the price of liberty—and of national parks.

We are told, "To be safe, resist the beginning."

Even if we expended all the few resources we must forego to keep an unimpaired national park and wilderness system, we should gain but a few years' respite from the search for substitutes which a resourceful people will find. Parks are too much to lose for so little gain. It makes sense, therefore, to develop substitutes in time.

To give this view perspective, let's use a statistic. There are reported to be—the Bureau of Reclamation uses this figure—400 billion tons of bituminous coal in the upper basin coal reserve. All the power that Echo Park Dam will generate from start to silted-up finish can be replaced by utilizing only 10 ounces of coal out of every

ton of coal in the upper basin reserve, assuming no upstream sediment control.

Or state it another way. For all its importance there legitimately developed, hydroelectric power provides but 5 percent of our present energy requirements. Coal, oil, and gas supply the rest. If we developed every usable bit of stream in this country, we could add but 2 percent more of our present requirements. The undeveloped part of the Colorado is but a fraction of that 2 percent, and Echo Park Dam is but a fraction in turn of the undeveloped part of the Colorado River. Multiplying these factors together, we come up with a ratio that can be expressed this way: If you were to consider that our total rate of using energy today would light our national house for an evening, Echo Park's total share would come on and go off while you blink your eye. It is 1 part in 10,000.

Echo Park Dam would solve no power shortage, and it would lose a park forever.

Statistics are tiring, but to the foregoing, which I have derived from Harrison Brown's revealing book, the *Challenge of Man's Future*, I add one more by courtesy of Mr. Robert Le Baron, who was interviewed in the June 25 U. S. News & World Report on the subject billed on the front page as "Atom Power for Homes in 5 Years." The statistic: Our uranium reserves are roughly 25 times the United States coal reserves and 100 times the oil and gas reserves.

Echo Park, therefore, could supply only the most infinitesimal part of our energy requirements before it silted up. Left as a natural wonder, it can fulfill a park need until our culture dies, several millennia, let us hope, into the future.

I hope these remarks have made two points.

1. Even if we had to choose between this park and this resource, we should choose the park, for it adds too little to our resources, and it depletes too much from parks we shall need far more urgently.

2. But we don't even have to choose. The upper basin States can eat their cake and have it too, and the Nation will gain from both—provided that we use alternative solutions, and require that they be objectively presented.

If everyone agreed with this statement, you would have before you a bill which didn't contemplate an Echo Park Dam—if, indeed, such a bill hadn't already passed the Congress 4 years ago.

But apparently everyone doesn't agree, and I would like to discuss a few more facts for whatever this may accomplish toward bringing agreement closer.

All along, the Sierra Club's chief concern has been national park and national wilderness preservation. The principle of park preservation should be able to stand alone. But we have been persuaded by practical men that one way to prevent park invasion to offer alternatives to that invasion. This has led us to study more thoroughly than we wished the details of the upper Colorado storage project, to make our own observations about it, to check them with experts, to dig out facts that were missing in the basic 1950 report on the project by the Bureau of Reclamation, to discover important errors, and to see the Bureau correct some of them.

From this study we come up with this tentative conclusion, which we can amplify in such detail and with such documentation as you

may wish: That conclusion, even if the present plan did not invade the park system, which it does, and even the total plan had been proved necessary, we do not find that it has, still it is not a sound project.

When I was pointing out various probable flaws in its soundness before the Hoover Commission task force in San Francisco last May, Governor Lee, of Utah, said to me:

Don't you think you are on a sounder ground in your argument on that basis—unsoundness—than you are that it is going to injure some park? * * * I think your soundest argument is against the cost, and certainly isn't because it is part of the national park system.

I quote him directly from the transcript.

I disagreed, because we believe that if we defended only those parks which could not be soundly exploited, our national park system would have died before Abraham Lincoln started it. That does not mean, however, that we feel we should shun considerations of engineering or economic or agricultural soundness.

I have gone into these questions with no engineering background except what an editor can acquire when his father and his brother are engineers—and when he knows a few top engineers to go to for assistance. This is similar to the procedure an attorney would follow in the same situation. The following pages deal with questions and answers arising from discussions with competent authorities in the various fields concerned. I hope they will help you in defining a sound project.

Senator WATKINS. Have you made these same suggestions to the House committee?

Mr. BROWER. No.

Senator WATKINS. There is only one Senator here at the moment. If you had made them previously or if they can be placed in the record, that will be fine.

Mr. BROWER. I would like very much to make them, if I may, sir.

Senator WATKINS. Well, other witnesses have placed into the record their statements.

Mr. BROWER. This is one that I think would be good to present now with some Bureau of Reclamation people here.

Senator WATKINS. You see, you did not quite abide by the rules. We require 48 hours, at least, on submission of the copies of the documents.

Mr. BROWER. I had a terrible time yesterday getting this thing out of the mimeograph by 6:30.

Senator WATKINS. You are a public relations man; are you not?

Mr. BROWER. No.

Senator WATKINS. What is your occupation?

Mr. BROWER. I am an editor. I have quite a bit of experience as an editor in a publishing house, on books.

Senator WATKINS. What is your home address?

Mr. BROWER. Berkeley, Calif.

We have two constructive suggestions to offer. First we urge that destruction of park values be avoided and that the national park and wilderness system be improved.

Our findings agree with those of the best qualified experts, who have devoted their careers of their philanthropic efforts to park preserva-

tion. Our findings are that dams in Dinosaur would forever destroy all that is of national-park meaning in the place. We know that Dinosaur, for all its relative obscurity today, is one of the finest parts of the national park system. We know that an invasion here will gravely threaten the entire system. For although you can ask yourselves here, "To dam or not to dam?" it is beyond anyone's power, gentlemen, to say what will or will not be a precedent. Only time can decree that. What goes before is precedent, and cannot be undone.

If a half-century-old reclamation withdrawal at Brown's Park should now be used to destroy the park quality of the heart of Dinosaur, then Kings Canyon National Park is on the way out along the same road. The destructive pattern would have been set.

The Federal agency that would normally be here to protect the parks from a damaging precedent cannot appear without jeopardy. The charts, the photographs, the documents, the tables and diagrams, the staff, the pleas—all these things that an efficient agency of the administration could have assembled to help save the parks—this service has been denied to you, and I fear that the agency would suffer were you to order it to appear.

A mere handful of men, most of them laymen, are trying to fill that wide gap. They come to represent organizations concerned with the public interest in conservation, organizations that exist on modest dues paid by devoted members. It is an enormous responsibility.

The Sierra Club's second constructive suggestion concerns a proposal for a revised upper Colorado storage project. The proposal covers many fields of study, and, as I have pointed out earlier, we have been most fortunate to have been able to rely on expert opinion, both from within and from without our own membership, for our information in these various fields. I am especially reassured to be able to tell you that one of our experts is the same expert upon whom President Eisenhower, after a searching of the country, has relied for information in the same field. When we speak of evaporation loss, for example, we speak with a background of information assembled from hydrologists all over the Nation.

In outlining the proposal of a revised project, I must necessarily speak in round numbers, for our basic data, those compiled by the Bureau of Reclamation, have not yet been subjected to the dispassionate check which has been urged by many advisers to the administration and by independent agencies. Round numbers will, however, provide you with the general order of magnitude of what is involved.

An important letter from former President Hoover was brought to the attention of this subcommittee Tuesday by Senator Bennett of Utah, who spoke of Mr. Hoover's acute perception concerning Colorado River problems. Mr. Hoover's insight is the result of his long engineering experience and intimate knowledge of that stream. I would call your attention to one of Mr. Hoover's extremely important sentences in that letter:

Studies now available show that to meet this obligation, the 1922 compact, the upper States will have to provide at least 20 million acre-feet of holdover storage to be used during low flow periods, comparable to 1931-40, or, lacking storage, will have to limit their use to about 64 percent of their allocation, in order to make available 75 million acre-feet at Lee Ferry.

In that one sentence is the key to a revision of the upper Colorado project which will resolve a controversy and which also will accomplish the following:

1. Provide each upper basin State not only with its full allocation, but also with more water for beneficial use than the present proposal will make available.
2. Eliminate enough proposed evaporation loss to supply a city the size of New York.
3. Retain Dinosaur National Monument in an unaltered condition.
4. Reduce by about \$975 million the proposed storage cost.
5. Maintain higher water quality in the basin.
6. Develop more power potential with greater upper-basin benefits.

Although Mr. Hoover's sentence was written in 1945, it has recently been reviewed and is correct. The revised project derived from it offers tremendous advantages to the upper basin and the Nation. I am sure that there are several independent engineers who can assist the administration in developing the details.

In summary it would operate in the following manner:

SUMMARY OF REVISED PROJECT

1. The Mexican Treaty in effect reduces allocations to both basins by 10 percent and the upper-basin allocation is 6,750,000 acre-feet (7,500,000 less 750,000). So in our thinking we should use this figure—6,750,000 acre-feet.

2. Adjusting Mr. Hoover's figures for this, the upper basin with no storage can fulfill compact commitments and use 70 percent of its allocation, or with 9 million acre-feet storage it can use 85 percent of its allocation. I will talk about the remaining 15 percent in a moment.

3. Here is a table showing an equitable distribution of the 9 million acre-feet of storage.

(The table referred to follows:)

Dam	Active capacity (1,000 acre-feet)	Evaporation (acre-feet)	Cost (1953 where available or 1950 plus 12½ percent)
Flaming Gorge.....	2,950	56,000	\$93,000,000
Cross Mountain.....	4,200	70,000	57,000,000
Curecanti.....	800	116,000	43,000,000
Navaho.....	1,050	16,000	71,000,000
Totals (rounded).....	9,000	160,000	275,000,000
Present project (10-dam) total.....	37,000	830,000	1,250,000,000
Difference.....	28,000	670,000	975,000,000

¹ Estimate.

Mr. BROWER. 4. This storage falls 15 percent (1 million acre-feet) short of providing the full upper basin allocation. Nevertheless, the upper basin can have more water available for actual use under the revised project than under the present project. There are several methods for realizing this. Here is one.

Senator WATKINS. Who prepared this plan?

Mr. BROWER. I did.

Senator WATKINS. It is your preparation?

Mr. BROWER. Yes, sir.

Senator WATKINS. You say you are an editor?

Mr. BROWER. I point out that I am the son of an engineer, the brother of an engineer, I am an editor, and I should put there I think pretty much the same statement that I tried to explain to the House committee, that in my editorial training I was working not on novels or poetry, but on technical papers in many scientific fields. The editor is trained in that sort of work for nothing else than for an objective attempt to appraise the logic of a given subject and a paper in its presentation. In various fields that I have been editing in—

Senator WATKINS. What papers have you written for? Where have you been employed as an editor?

Mr. BROWER. At the University of California Press, in its book publishing and scientific monograph publishing program. We have papers in practically every field you can name, from economics, agricultural economics, on down through engineering and down to zoology, with a "Z."

Senator WATKINS. And you have lived with engineers?

Mr. BROWER. I have lived with engineers and I know a great many top engineers of the country and, of course, have had great opportunity in the last few months and some opportunity in the preceding 4 years to be very concerned with the details of this project and the various possibilities.

Senator WATKINS. Do you think this is a sound program?

Mr. BROWER. I think it is.

Senator WATKINS. You recommend it. And what do you base that on?

Mr. BROWER. I think that will come out as I finish here, that some of the answers that will be needed are in the few remaining steps here, a few words left, and I will be ready to answer questions that may be raised on that thereafter.

Senator WATKINS. I am very much interested, because if the thing you say can be done, instead of a lot of people working for the Bureau of Reclamation we should have had an editor who understands better than the engineer how these things should be built.

Mr. BROWER. It is not a matter of checking the engineer's details. I am not concerned whether it should be a gravity flow or forced flow, or how you compute the mathematics of that.

Senator WATKINS. Did you compute all of those costs yourself?

Mr. BROWER. These costs—

Senator WATKINS. Can you answer the question?

Mr. BROWER. I have taken these figures from the Bureau of Reclamation and such adjustments as I have made are explained in the little note there in the table. The source throughout is the basic data of the Bureau of Reclamation, which of course, is all we have except for notes from here and there on various aspects.

Senator WATKINS. As an editor you have read over this report and you have come out with what you think is a good project, a good program; is that right?

Mr. BROWER. Yes, sir. I have read over these things, this report, the 1950 report, the 1947 House document, the various supplemental documents of the other Government agencies that have gone forward in

two batches with the documents, plus supporting material from other engineers and other experts in a good many fields that we have discussed this with month after month.

Senator WATKINS. You tell me the experts you discussed it with, the outstanding engineers, for instance. Let's get the list of them.

Mr. BROWER. Sir, the list of engineers I can prepare for the committee file. There are some whose names cannot be used now.

Senator WATKINS. Why not? This is a public service, as you said. They should not be ashamed of having their names used.

Mr. BROWER. Well, some of these have requested that their names be left in confidence, and that is all I can do, respect that. I feel I have that obligation.

Senator WATKINS. Did you ever discuss it with any of them that have actually made any engineering study on the Colorado River?

Mr. BROWER. Yes, sir.

Senator WATKINS. Out in the field?

Mr. BROWER. Yes, sir.

Senator WATKINS. Can you name them for us?

Mr. BROWER. The name of the engineer that I would have to give there is this special adviser to the president, and I cannot give that now.

Senator WATKINS. Have you discussed it with the engineer for the California-Colorado River Board?

Mr. BROWER. He has seen a few of my statements.

Senator WATKINS. Have you discussed it, I am asking? You say he has seen a few of your statements. I am asking you if you have discussed it with him.

Mr. BROWER. I have seen him, I have discussed it with him very briefly. I would not want to say, I would not want in any way to commit him for being for or against this.

Senator WATKINS. Did he make any of the suggestions or give you any of the facts that you have included in your program?

Mr. BROWER. No, sir. I had never met the gentleman before I reached town.

Senator WATKINS. What is his name?

Mr. BROWER. I believe it is Mr. Matthew.

Senator WATKINS. You are sure about that, are you?

Mr. BROWER. I am not sure of the title. There is a State engineer, a State water engineer, the Colorado Water Board engineer, and there are several in that group.

Senator WATKINS. How many of the Colorado River Board's engineers or lawyers or others have you discussed this with?

Mr. BROWER. I have discussed this—I have not discussed it particularly, I have let them look this over—

Senator WATKINS. Tell us what you have done with it. Have you talked with them?

Mr. BROWER. I have talked to them.

Senator WATKINS. And they have talked to you?

Mr. BROWER. I have talked to them and they have talked to me.

Senator WATKINS. A good many times?

Mr. BROWER. No, sir.

Senator WATKINS. How many times?

Mr. BROWER. Since I arrived in Washington, and I would say twice.

Senator WATKINS. What about when you were in California?

Mr. BROWER. No, sir.

Senator WATKINS. Do you have any letters from them?

Mr. BROWER. No.

Senator WATKINS. Have you ever written them about this project?

Mr. BROWER. I have not written them about this project.

Senator WATKINS. Have any of your officials of this Sierra Club written to the California water officials of southern California about this project?

Mr. BROWER. I do not believe so, sir. I do not know. I could not speak for the 9,500. None have written that I know of.

Senator WATKINS. You don't have that many officials. I am talking about officials.

Mr. BROWER. Well, of the officials, no, none that I know of.

Senator WATKINS. What is the connection between the Sierra Club and the California River Board?

Mr. BROWER. Sir, there is no connection whatever.

Senator WATKINS. Or water conservancy. I think you understand the organizations down there. You know that, of course, the California-Colorado River Board has objected to this project; do you not?

Mr. BROWER. I know that, sir. I have seen their statement along with all the others that went forward with the documents.

Senator WATKINS. You joined forces with them; did you not?

Mr. BROWER. No, sir.

Senator WATKINS. Why were you talking to them?

Mr. BROWER. It happens that in some respects there are parallel purposes.

Senator WATKINS. That is right. You want to defeat this project; do you not?

Mr. BROWER. No, sir; I do not. I cannot speak for them. I think they will have the opportunity to speak for themselves.

Senator WATKINS. In this little book, *Dinosaur Parks and Dams* by David R. Brower, in 1954 the book was published, I think, or reprinted. There is an excerpt here. Did you write this paragraph?

The intelligent layman can also ask for answers to the objection by other Government agencies. I further wonder how fervently the Federal Government should support at financial risk to all the Nation a 1922 river allocating compact which in 1954 emerges as a costly device to lift Colorado River economy by its bootstraps.

Did you write that?

Mr. BROWER. Yes, sir.

Senator WATKINS. You do not like the 1922 compact, do you?

Mr. BROWER. No, sir; I did not say that, sir, and I have no criticism of that compact. I say that the intelligent laymen may ask some questions about it.

Senator WATKINS. You are one of those intelligent laymen, I take it, that was asking the question when you wrote that. What did you intend by that sentence? What do you mean by it?

Mr. BROWER. Sir, I can answer this perhaps in this manner, that that is one short paragraph out of a fairly long article, not very long, that perhaps might go into the record at this point so that that could be seen in its whole context in the way it fits in with the whole proposal.

Senator WATKINS. We will determine that later. I am asking about this now. I want to know what you mean in this particular paragraph.

Mr. BROWER. In this particular paragraph?

Senator WATKINS. It won't be taken out of context because I am giving you a chance to explain it.

Mr. BROWER. I have suggested various points in here that still need resolution. This is one point that still seems to need some resolution or at least review.

Senator WATKINS. As I remember, you started out in this paper today by telling us that you are not against this project.

Mr. BROWER. Sir, begging your pardon, I am not against the—the Sierra Club is not against a sound Upper Colorado River storage project which does not invade the national park—

Senator WATKINS. Suppose you take Echo Park out of it. Are you against it then? Would you be against it then if we took Echo Park out of it?

Mr. BROWER. If you took Echo Park out of it and also the plan for Split Mountain Dam out of it.

Senator WATKINS. Well, take Split Mountain out.

Mr. BROWER. Both the dams that invade Dinosaur National Monument. This organization, so far as I can speak for it now, without checking that once again with our board of directors, would no longer oppose.

Senator WATKINS. Even though it is a costly device, this 1922 compact is a costly device, to lift Colorado River economy by its bootstraps?

Mr. BROWER. That question—wait a minute. What was I going to say? There would be in our membership, which includes people all over the country, west and east, people who I am sure would continue to oppose it, so long as it was unsound.

Senator WATKINS. Well, it wouldn't be sound if it attempted to lift the Colorado River economy by its bootstraps, would it?

That is what you think this whole thing is?

Mr. BROWER. No, I do not think so. I suggest, sir, that that question be asked. There are various answers that I could suggest. One is that you consider the population to be served. Another is that you consider where you get the most production. But a third, as I bring out later in my paper, which is probably the important one, is where—

Senator WATKINS. I will get to something later in your paper. Right now it is this paper I am reading from. The next sentence: "Or to take what 4 Peters are using in the lower basin, population 12 million, and can continue to use at its own expense in order to give it to 1 Paul in the upper basin, population 3 million, a Paul that has not used it yet, but he thinks he can, if Uncle Sam will stake him to it and throw in Dinosaur free."

What do you mean by that?

Mr. BROWER. That is one aspect of the question, that various people over the country might well ask.

Senator WATKINS. You are asking, aren't you? Who is the intelligent layman you had in mind when you wrote it? Wasn't it a fellow by the name of Brower?

Mr. BROWER. Brower said intelligent people might ask the question and I don't think that comments upon Brower's intelligence.

Senator WATKINS. Is that not your own sentiment, as a matter of fact?

Mr. BROWER. Not necessarily. That is part of it.

Senator WATKINS. What part of it?

Mr. BROWER. I might point out that it is a minor part of my sentiment.

Senator WATKINS. It is quite important to this project, if you are saying those things about it, Uncle Sam will stake to us, in fact give it to us, and throw in the Dinosaur project free. You certainly were not showing friendship when you wrote that.

Mr. BROWER. I cannot show friendship for a project that has claimed repeatedly that the keystone is Echo Park. If the project were derived from the Bureau of Reclamation and various studying agencies without an Echo Park in it, that would be a completely different matter, if it did not invade the park system. But when it starts out, and with that as the alleged keystone or wheelhorse or piston or any number of terms, and whenever the attempt to suggest that we try something else is just met with very strong objection, then we have no recourse but to be against that project until some other system is worked out.

Senator WATKINS. Do you think the Echo Park is an uneconomical dam?

Mr. BROWER. Yes. It so happens that I do at this point.

Senator WATKINS. That is irrespective of whether it is a park or not. Take it on the basis of just being a project, as a dam for the storage of water and the generation of power, and to help regulate the river. Do you think it is an uneconomical dam?

Mr. BROWER. I would say, sir, that I do.

It comes rather as a hypothetical question. I would answer it by going back.

Senator WATKINS. It is not hypothetical at all. You have made a study and you have given us an alternate program. I want to know if this is an uneconomical dam from your point of view.

Mr. BROWER. I think that I do believe it is.

Senator WATKINS. You believe what?

Mr. BROWER. I believe it is uneconomical.

Senator WATKINS. Point out where it is.

Mr. BROWER. I was going to say had it been built perhaps 40 years ago when costs were different it might be a different situation. But in our present—

Senator WATKINS. Suppose if it is going to be built, if it is going to be built at all, several years from now. Suppose that prices should not be as high in a few years as they are at the present time. Would your opinion still be that it is an uneconomical dam?

Mr. BROWER. Yes, sir.

Senator WATKINS. Tell us why it is uneconomic.

Mr. BROWER. It is uneconomic because the costs are quite high, we do not know really what the current estimate is. The last figure we have, for example, is January 1953. We have various interpretations of how the costs on the various elements, including transmission, should be allocated. We do not know exactly what they can pro-

duce their power for per mill. We know it comes out about 6.3, if you average Echo and Split. The thing that is more important in the current trend of upper basin development and with atom power closer on the horizon than even News and World Report indicate it, because of yesterday's development where Russia is ahead of us already, we have to step that up, and a study of our other energy resources show that you can produce Echo Park's power if you federally subsidize the plant for from 1 to 2 mills less per kilowatt-hour by using your coal and steam rather than using hydro.

Now, with that difference, and the advantages which accrue to your upper basin if you exploit this wonderful reserve of coal, I would say that Echo Park Dam is uneconomic, that it is——

Senator WATKINS. You can produce power cheaper by using coal?

Mr. BROWER. Yes, sir.

Senator WATKINS. Do you have any figures on that?

Mr. BROWER. Yes, sir. I have a statement here which I would like to——

Senator WATKINS. I mean of your own now. You are talking about what you know about this.

Mr. BROWER. I am talking about what I know, sir. What I know, as I have tried to explain, comes from various people. Quite a bit of it I can commit to memory.

Senator WATKINS. You got a lot of it from your father and brother who were engineers?

Mr. BROWER. I beg your pardon.

Senator WATKINS. And you got some of it from your father and brother, who are engineers?

Mr. BROWER. I got an approach from engineering, I had to learn how to live with engineers. But on this specific problem I got figures from the Federal Power Commission and from the present Sierra Club vice president, who is an engineer, who knows a great deal about energy sources, Alex Hildebrand. I have his statement here, which I think would be well worth putting into the record where the other Senators could see it, to follow his logical line of reasoning on what this opportunity is, because I think it is a real opportunity for the upper basin.

Senator WATKINS. Is his statement the basis of what you put in here as your program?

Mr. BROWER. His statement is the basis of this one aspect on steam. That is the major part of the basis.

Senator WATKINS. Now let's get back a few minutes to your associations within the California Water Board of Southern California.

Mr. BROWER. I know Utah is very suspicious and the Salt Lake Tribune is awfully suspicious, but they are wrong.

Senator WATKINS. I found out from you that you apparently have the same purpose.

Mr. BROWER. No, sir.

Senator WATKINS. You said something about it, and you are running along a parallel course in having the same purpose. I thought that was what you said a few minutes ago.

Mr. BROWER. Could I correct the wording on this?

Senator WATKINS. You can say what you want to say now, but you cannot take away from the record what you have already said.

Mr. BROWER. I wouldn't want to take that away. They are opposing this project, as I understand it, because they do not think it is sound. We are opposing this project because we do not think it is sound, because it invades the park system.

Senator WATKINS. And because it comes out of that 1922 compact which emerges as a costly device to lift the Colorado River economy by its bootstraps. Is that not right?

Mr. BROWER. That is a question I asked. That is not a position I took. There is one point—

Senator WATKINS. Well, when you ask questions, sometimes you state your views in the form of questions, not quite having the courage to come out flatly and state them.

Mr. BROWER. I think, sir, there are statements in here where I was expressing the opposition of it, too. I was trying to do a roundup of 2,500 words for an audience that knew nothing about it.

Senator WATKINS. When you put the words into the mouths of some of these intelligent laymen, because you say an intelligent layman could ask for answers to these—

Mr. BROWER. I don't think you would want to say that he should not ask those questions.

Senator WATKINS. I am assuming you are the intelligent layman.

Mr. BROWER. Well, whoever the intelligent layman is, I think that is a question he should consider. How he answers it, I don't know. My own answer at the moment is that the criteria of population, of agricultural production, are not the ones which should govern. And I think Mr. Clyde here has presented very ably the criterion which should be used which is of great importance to the Nation, and that is decentralization.

Senator WATKINS. Then you ought to be for this project.

Mr. BROWER. I am for this project that I am trying to complete the presentation of, but not against the present Bureau project, because I think it is an expanded manner in doing it.

Senator WATKINS. What was your idea of contrasting the population of 12 million people in the lower basin against 3 million in the upper basin?

Mr. BROWER. The idea was to show—that was part of the business of the bootstraps.

Senator WATKINS. The idea was to show that the compact after all was a bad mistake, that that water should go down to the 12 million people and not be held by 3 million people up there; isn't that right?

Mr. BROWER. No, sir.

Senator WATKINS. Is that not actually what you had in mind?

Mr. BROWER. No, sir. That is a question I would like answered, but I would like it answered by people who know more about it than I. I would like to see the answer.

Senator WATKINS. Do you think that the upper basin States ought to have their rights under the contract?

Mr. BROWER. I think the upper basin States should probably have more than they are presently getting under the present plan, and that is what this would provide.

Senator WATKINS. And cheaper?

Mr. BROWER. And cheaper. I realize it is a rather shocking presentation, but it did not just arrive from Mount Sinai, or anything else.

It is something I started thinking about when the Salt Lake Tribune put me over the coals on this thing, that same paragraph, and then started to say what my motives were, and make all sorts of implications which were incorrect.

Senator WATKINS. Let me ask you this question about your motives and so on. Who is financing your expenses in connection with this campaign against the Echo Park Dam?

Mr. BROWER. The expenses of this, of our entire conservation effort, come entirely from the membership, the dues paid by our members, and from an occasional modest bequest. The largest bequest we have ever received was \$25,000. These bequests go into permanent funds and we can use, on most of them, only the interest as part of our operating expense.

Senator WATKINS. Do you have any acquaintance with the money income of the Sierra Club?

Mr. BROWER. Yes, sir.

Senator WATKINS. Are you its treasurer as well?

Mr. BROWER. I am not its treasurer, but I have to struggle with the budget every year. What question would you have there?

Senator WATKINS. Have you received any help directly or indirectly from the southern California interests who are objecting to this project?

Mr. BROWER. Absolutely none, sir, nor would we accept any if offered. That is an answer that I wrote back to the Tribune after they had asked the same question, and it took two efforts to get them to answer it, to put my letter in.

Senator WATKINS. Now you say you came to Washington to confer with these people after you arrived in Washington?

Mr. BROWER. I conferred—

Senator WATKINS. When I said these people, I am referring to these officials of southern California who have been objecting to this project.

Mr. BROWER. I have never conferred with these people before. We have been working on our own information. All I had seen before, expressing their view, and this is a point to bring out, was this report in blue covers that I think you have seen, the State of California's objections. That report was published in February, I believe. Prior to that, the State of California's position had been that was almost adamant, you might say. Back in their comment first on the 1950 report, I think you may recall, if you refer to the record, that the State raised hardly a murmur. At that point, the Sierra Club was raising quite a murmur. We got interested in this about 1950, and by 1952 we had taken a strong position, which is the same one we have today, while the State of California insofar as I know, the Colorado River Board, were saying nothing, and what they thought, I do not know.

Senator WATKINS. Let's get back to the question I asked you. What did you do when you came to Washington? Did you have a conference with the representatives of this group?

Mr. BROWER. I spoke briefly with the representative—

Senator WATKINS. You did have a conference?

Mr. BROWER. And an engineer.

Senator WATKINS. The answer is "Yes." Who did you have the conference with?

Mr. BROWER. I spoke briefly with Mr. Matthew and Mr. Ely.

Senator WATKINS. Who else?

Mr. BROWER. That is all.

Senator WATKINS. Just those two?

Mr. BROWER. Those two.

Senator WATKINS. Did you seek them out or did they seek you out?

Mr. BROWER. I sought them out.

Senator WATKINS. Did you have an appointment before you came here?

Mr. BROWER. No, sir; I had no appointment, and I had wondered in view of the great suspicion that Salt Lake entertained about Sierra Club motives whether I should even say "boo" to these people. I called home and found out that I should say "boo." That was it. I saw them about, I would say, it totaled perhaps an hour and a quarter of the entire time I have been in Washington. The rest of my time I have been in consultation for the most part with our other organizations who share our position, and who, in fact, led us into taking this.

Senator WATKINS. You discussed what you were going to present today, did you not?

Mr. BROWER. I discussed it briefly, for instance on this thing that I am trying to complete now. When you kick these things around in your mind for a while, you get the idea, and you want to check with quite a few other people to see just how your own logic is going. You needed editorial suggestions, in effect, from other people. I felt a strong need to see if I had made some great big glaring mistake, right at the start here, in my logic. I am not saying that they say my logic is good or bad, I don't know what they think. But I do know that I did feel the need of getting checks by several people while here on something that I had stayed up to about 2 o'clock in the morning in my hotel room on two occasions trying to get into shape.

Senator WATKINS. You tell me how long you actually spent for working out this program which you say is a better program for the upper basin.

Mr. BROWER. Well, it has its beginnings back in about 1950 when I first heard of Dinosaur, and all this background must go into it.

Senator WATKINS. How much time did you spend on concocting this scheme?

Mr. BROWER. In developing this counterproposal, sir—

Senator WATKINS. Yes, that is what I want to know. If you really have something here, we certainly ought to get you on our payroll in a hurry before we spend a lot of money that is not necessary and we do a lot of damage to the country. I think you ought to tell us now how long it took you to get this together.

Mr. BROWER. I don't know whether you want it estimated in days or months or hours.

Senator WATKINS. Yes, I think you ought to give us the details.

Mr. BROWER. For the last 6 months I have really been thinking awfully hard on this subject, so hard—

Senator WATKINS. You have been writing articles, all the time for the magazines, publicity to get out against this project?

Mr. BROWER. I have had quite a bit to write, yes, sir. But a lot of it has been reading what I call now my bible, which is the 1950 report and which I think I have written more in the margins than there was written in the report.

Senator WATKINS. It is not important how much you wrote, it is important as to what you wrote.

Mr. BROWER. That is right. But the time spent on it was a great part of my time for the last 6 months, so much so that my wife, I think, is complaining at this point that she married a dinosaur.

I have conferred with members of the various advisers to various Government agencies on it, and all of this has been built up and supplies parts of the background upon which I can now draw to offer this.

Senator WATKINS. Let me ask you this: Did you spend a year working up that program?

Mr. BROWER. This program that you see before you?

Senator WATKINS. The one you have outlined for us to follow.

Mr. BROWER. I would say of intensive study about a half year.

Senator WATKINS. About 6 months?

Mr. BROWER. And that of course would have been impossible if I had had to go after my own basic data. It is the basic data which require years in preparation, and those data are taken and interpreted and brought into a plan.

Senator WATKINS. Then you get that in your editorial training, being such that you can properly evaluate all you have read and finally work out a program?

Mr. BROWER. I think the training is good enough so that I can try—

Senator WATKINS. You can try, I will admit. Anybody can do that.

Mr. BROWER. I can try and there can be some flaws in here. I would not certainly have the presumption to sit here before you and say, sir, this is it.

Senator WATKINS. That is just what you did say.

Mr. BROWER. No, sir. I say—I think I have said it here in these words, that this is a revised proposal in the broad view that will take the future study of people who are competent to work out the details and work out these fine tabulations of operating levels, year by year, in the year 2,075, who can work out the repayment schedules.

Senator WATKINS. Well, we got the answer. You said you spent 6 months.

Mr. BROWER. Six intensive months on basic data provided by the Bureau's 7 years of time.

Senator WATKINS. I wanted the time you put in on this particular question. You have already given us your views and said something about basic data. But you did spend 6 months in preparing this plan. All right, go ahead and finish the plan. Now we have a little background so we will know how to evaluate it.

Mr. BROWER. Where I left off was that the storage fell 15 percent or a million acre-feet short of your present allocation. But there is a way to get more water than you would get under the present Bureau's plan. Here is one suggested method:

Note first that if the present project's 6 remaining dams were constructed in order to provide for the last 1 million acre-feet, the upper basin could not use that 1 million, because 670,000 would be lost through evaporation from the reservoirs proposed by the Bureau of Reclamation, and this loss would be chargeable to the upper basin.

Thus for about \$1 billion it would receive only 330,000 acre-feet of water.

I think these figures can be followed as you go along, but I will go fairly slowly.

Therefore, it would be in the interest of both basins and the Nation to work out such an interbasin agreement as this: The upper basin could divert and use, for example, 650,000 acre-feet, which is more than the 330,000 it would have received, by using exchange storage downstream. Both basins would thus gain additional water because of the saving of irreplaceable loss through evaporation of water, a mineral for which we have yet to find a substitute.

Senator WATKINS. Would you rewrite the 1922 compact?

Mr. BROWER. No, sir; I would not rewrite it. I can see various reasons why the upper basin might wish to rewrite it, because the Colorado River was initially presumed to contain more water than it apparently now does. As I understand it, that could have been an equitable distribution if the wording had said 50-50. It didn't. It provided that you push 75 million downstream every decade and implied that in the upper basin you could have all the rest, except that there would be some argument about the surplus. It now looks as if there is no surplus. If there is less than the surplus, the upper basin will get less than its half. That is something that was not foreseen at the time of the compact. That is one of the questions, I think, the upper basin might well want to ask.

Shall I go on?

Senator WATKINS. Certainly. I think you have attempted an answer.

Mr. BROWER. And I was saying, through evaporation of water, a mineral for which we have yet to find a substitute.

5. Development of the other power sites can be deferred indefinitely. For there, hydroelectric power, thermal-generated steam power can be produced from upper basin coal, with enormous benefits to employment and economy in the region. All the power that the deferred dams would generate until they were fully destroyed by silt can be produced by utilizing 4 pounds out of each ton of coal in the upper basin reserve; 400 million tons is the figure cited by the Bureau of Reclamation, and I think you cited that in the Congressional Record rather recently; 800 billion has been cited by Mr. Clyde and Senator Bennett. I used the lower figure.

6. The Bureau's preliminary incremental analysis of November 9, 1953, indicates that the team of Flaming Gorge, Cross Mountain and Curecanti Dams, with some slight adjustment of joint-cost allocation, should be feasible, with Cross Mountain providing greatest assistance. These three together are almost exactly the equivalent of Echo Park in power generation and revenue. The details are not available on Navaho, because that has been in and out of the program so far, where the cost of producing power would be high, but where special considerations, as I understand it, should govern.

All four dams are high on their respective streams, and all would benefit diversion projects directly and avoid the concentration of storage low in the upper basin, such as at Glen Canyon, where there are newly discovered geological difficulties at the damsite and where the evaporation rate seems to be much higher than would be expected at that elevation.

WATER QUALITY

Reduction of water quality under the present Bureau plan might result from various factors, including:

1. Concentration by evaporation. The revised plan will reduce this quality loss by about 80 percent.

2. Dissolving of minerals from formation the reservoirs would flood. The revised plan reduces this loss by about 75 percent.

3. Exchange. Higher streams tend to be purer, and the central Utah project contemplates exchanging "highly saline," quoting from the Bureau's 1950 report, waters of the Green River for water in Uinta streams. In the present plan, gravity diversion from Flaming Gorge to Utah could be expedited, and the quality could thus be equitably balanced.

4. Leaching and return flow. This I think is a paragraph that has some promise for Utah, or a great deal of it.

Senator WATKINS. What page is that?

Mr. BROWER. Page 6, part 2, subparagraph 4.

Leaching and return flow. Quality loss from this source would be reduced if the upper basin should determine that its greater opportunity for expansion lay in domestic and industrial consumptive use rather than in high-altitude crop production and possible overburdening of rangeland in the watershed. It certainly seems to me that the Nation and the upper basin would gain if emphasis were placed upon industrial decentralization into the upper basin's mineral storehouse, as Mr. Clyde has stated so well. It is generally agreed that agricultural expansion, when our surpluses are gone, will be more economical and productive in the Middle West, East, and South.

Notice I even leave out southeastern California there.

Silt: The revised plan provides no expensive silt-collecting reservoirs on the main stem of the Colorado. But I think we will all agree that if possible, we should bend our effort toward holding the soil where it is instead of collecting it in reservoirs that cannot be replaced.

May we not join in urging a vigorous, two-pronged study of watershed protection, in the national interest for generations to come, upon appropriate Government agencies? I suggest the two parts for two kinds of streams—those which probably always ran muddy, and those which probably ran clear, even as the Yampa used to, when Charlie Mantle first came to Dinosaur, before man abused the land.

1. Desert sedimentation control. Vast quantities of sediment are brought into the Colorado, especially from the Little Colorado and San Juan basins, where flash floods are probably the geological rule, in areas where there may never have been and may never be vegetative types which can prevent devastating erosion. For control, do we need a few large-capacity settling basins or many small ones, built in areas presently of minimum agricultural and scenic value? There would probably have to be heavy evaporation loss during the settling-out periods in these arid silt-producing regions; this is the price that we must pay, I think, to keep this silt out of wealth-producing reservoirs.

2. Watershed protection. Soil conservation, revegetation and reforestation, and range improvement should be expedited in all those parts of the Colorado River system where there is a prospect of restor-

ing the natural protection of watersheds which can return us to clear streams and natural stream regulation through storage of water in humus, soil, and ground. We stand only to gain in the long run by conserving that critical asset, soil, and making a more beautiful river basin in the bargain.

Finally, in conclusion let me emphasize again that our concern for the preservation of the national-park system led us into an earnest effort to find a way whereby the objectives of the upper Colorado project could be realized in a program that would serve all the public interest. This effort has led us into a careful examination of all possibilities, and out of it has come, among other suggestions, the concrete proposal that I have just placed before you.

This proposal essentially calls for four storage reservoirs high on their streams: Flaming Gorge in Utah backing up into Wyoming; Cross Mountain and Curecanti in Colorado, and Navaho in New Mexico. These projects would serve not only for storage, but also for diversion of water for various uses. The proposal would avoid needless waste of a vast amount of irreplaceable water and improve water quality. It would cost nearly a billion dollars less than the project now advocated by the Bureau of Reclamation. It could vastly expand upper basin economy, and facilitate decentralization. It would save Dinosaur as the unique asset it is.

Such a program, developed as competent engineers can develop it, will, I am convinced, serve well the total public interest, including the interest of the upper Colorado region, in the wise use of their water and other resources—and also, I must emphasize, including the preservation of the national-park system which is such a valuable resource to the region and to the entire Nation.

Thank you, sir.

Senator WATKINS. I just have one comment. I noticed on page 2 of your statement—

Mr. BROWER. Is that part 1 or 2?

Senator WATKINS. Part 1. I quote:

What do they have in common? A certain kind of humility in the presence of the natural beauty in the outdoor world.

Nobody can object to that and I don't.

They have joined together to enjoy for themselves some of the finest scenery in the country, and to try to make sure, for the sake of their sons and yours, that man should not endeavor to scratch his name over the entire face of the land, but that man should instead leave some of the land unmarred, and unaltered, and unimpaired, that we might also know with what skill and artistry God made the earth, unaided by man.

I can subscribe to that. I might point out to you that the upper Colorado Basin States have left America, for the wilderness people and those who like to get out, a wilderness—a recreation area larger than all of New England combined.

I would also like to remind you that not only did God make the earth, but He made it for man, and one of the first commandments that He gave him as recorded in Genesis was to multiply and replenish the earth and subdue it.

We have the people and more people are coming. The population curve shows an increase that in about 15 years the United States will have 200 million people. What we are trying to do is to subdue the

earth and make it possible for people to have homes. I want to make that observation because you brought God into the picture and I think we are trying to follow His commandment. It is one of the ways and the only way that we have been able to contrive to use the water that has been given to us under the compact of 1922, and find some logical, economical way and sound way to pay for the whole project; to get the water for human consumption, for industries, cities, and towns.

I think God had an interest in what man would do with the earth because He made the earth for man. We still have plenty of places unmarred by man. We have an area much larger than New England in those States in which you can get the unscarred, untampered wilderness.

Mr. BROWER. And in which you could also, I think, put the reservoirs. Dinosaur is one of the very best things you have in Colorado and Utah.

Senator WATKINS. We have to have a way to get the people there. I have been working in the Congress for 7½ years. When I first came here, I did everything I could to get the park system and others interested in doing something about this monument, to get some money to build roads so people could get into it. And I met with rebuff on every hand. I could not get anyone to help. When a proposal was made to build this reclamation project, when it finally came to a head, then some people began to discover Dinosaur Monument.

I ask you the question: When did you discover it, when did the Sierra Club discover it? I used to live in this area and I know it rather well. I know people didn't go down there. I know it was dangerous. We did not have rubber boats when I was a boy. I never did get into the canyon myself. I looked into it from the top.

Mr. BROWER. I wish you could get down. That is all the difference.

Senator WATKINS. When we started with this proposal to put to use that water, then you people came to life, and that is the first time that I know of that you ever took any interest in this particular project. That is the reason that I am really little disturbed over the kindness that you want to extend to us, to save money. After we spend millions of dollars to develop this program, then you come along with this program developed in 6 months, to say in effect that "You have wasted your time and energy," and that you have a better way to do this job.

Thank you for your testimony.

Mr. BROWER. I think perhaps because Mr. Untermann mentioned the Sierra Club, I ought to say that apparently he was given inadequate or misleading information on the various references he made in his testimony, and if he would care to communicate with any of the members in San Francisco, I think that he would find out that he has a wrong view of how we operate and how we have operated for 62 years.

We have been concerned with things as far away as Alaska, as the Matterhorn, and if they are back yet I don't know, but even the fourth highest mountain on earth, where we hope we are getting an expedition back from it this month. We are interested in all these things. We operate, I think, on democratic principles. We have studied a great many subjects in all sorts of manner, but mostly it goes to a committee just about the same as we operate here.

From a committee to the board of directors, and the membership if it does like it, speaks up; and if they don't like it they speak up.

Senator WATKINS. Thank you very much.

Mr. BROWER. You are welcome.

Senator WATKINS. We will have to take a recess at this time because we have a witness who has been given a specific assignment to testify at 2. We will recess now until 2 o'clock.

(Whereupon, at 12:25 p. m. the committee was recessed, to reconvene at 2 p. m. the same day.)

AFTERNOON SESSION

The hearing was resumed at 2 p. m.

Senator WATKINS. The subcommittee will be in session.

The Chair is advised that the Honorable Leslie A. Miller, former Governor of Wyoming, is here and wishes to testify on this matter.

We will be glad to hear from you, Mr. Miller.

STATEMENT OF LESLIE A. MILLER, FORMER GOVERNOR OF WYOMING, CHAIRMAN OF THE TASK GROUP ON RECLAMATION AND WATER SUPPLY OF THE HOOVER COMMISSION

Mr. MILLER. I am Leslie A. Miller, former Governor of Wyoming, presently the Chairman of the Task Group on Reclamation and Water Supply of the present Hoover Commission. I am a member of the overall Task Force on Water Resources and Power, and I appear here with the full approval and consent of Mr. Hoover and of Admiral Moreell, who is the Chairman of our overall task force.

I wish to say at the outset, Mr. Senator, that I think that we are entitled to protest this kind of legislation at this time, in view of the fact that Congress unanimously voted the Hoover Commission into being and empowered this present Commission to do something the former Commission was not empowered to do, and that is to look into policies of the Government as they affect business in one direction and another.

Now, in that line, then, we are examining into all of the administrative policies having to do with the administration of water. We are studying policies in the field of irrigation, power, navigation, and flood control. We have just concluded a series of 5 hearings, the last 1 being at Portland early this week, and I flew from Portland here yesterday.

I want to say just a word in apology, perhaps, Senator, for not having been able to supply you with a written copy of my remarks; because I received authority from Senator Millikin to appear here today just a few minutes before I left for Portland, and I have been so busy on that investigation out there that there was no time to prepare this in detail.

Senator WATKINS. You said you were appearing here with the full consent and approval of Mr. Hoover and Mr. Moreell?

Mr. MILLER. That is right.

Senator WATKINS. Are you appearing here in an official capacity?

Mr. MILLER. Yes, sir.

Senator WATKINS. When was this authority given you to appear? I do not care to question it, but I had information to the contrary. That is the reason I am raising the question.

Mr. MILLER. Well, we have had conversations about this over the last several days; with Admiral Moreell out at Portland and with Mr. Hoover over the phone several times. They are fully aware of my appearance here.

Senator WATKINS. Do you pretend to speak for the Commission?

Mr. MILLER. In the respect of those things I just mentioned, Senator. In some others, I will speak for myself. In stating that I believe that this legislation is inconsistent with the action of the Congress in establishing the Hoover Commission, I speak as a man attached to the Commission. With respect to some of the particular projects to which I will make reference, I am going to deal with those on my own.

Senator WATKINS. I wish you would specify as you go along when you are speaking for the Commission and when you are speaking for yourself, because it is highly important for the Congress to know.

Mr. MILLER. Then, Senator, I will say at this point that I have no desire to say anything further for the Commission or for the task group to which I am attached. I repeat that we feel that we should be allowed to make these studies in which we are engaged and to report on those studies with the recommendations which we deem in our judgment, as a result of those studies, to be consistent with the existing situations in the different fields.

From here, if I may, then, Senator, I will address myself to you in my own right.

I do not have anything in particular to say with respect to the dams in the Colorado River project as proposed. I will content myself with saying this: That I think Glen Canyon is a good dam project, and properly handled and administered can be made to pay for itself and provide a great many benefits.

With respect to Echo Park, my position is this. It does invade a national monument or a national park, and I would say that for a good project or a poor project, if an acceptable alternative could be found, it would be my position that it should be accepted, because I agree with a great deal of the testimony that has been produced that we do not need to invade the national parks. I think it is poor policy.

Reference was made by the gentleman who appeared this morning to the efforts that have been made in the past to make an irrigation reservoir out of Yellowstone Lake in Yellowstone Park. Early in my administration in 1933, a proposal of that kind was directed to my attention by the then Secretary of the Interior, Mr. Ickes. I had not heard of it theretofore. I contacted the State engineer of Wyoming and learned that the State authorities of Wyoming and Montana were negotiating a possible compact, which would provide for the making of a storage reservoir out of Yellowstone Lake. And to be real brief about it, I put a stop to it. And if there have been any renewals of those efforts since that time, they have not come to my attention.

In my mind, the making of Yellowstone Lake into a storage reservoir would just be out of line with appreciation of what the national parks means to the general population of this country.

Now, I repeat that without making any reference to what Echo Park does to the scenery up there, what it may or may not do with respect to the Dinosaurs, without respect to whether it may or may not be a good economic power producer, I repeat that in my feeling,

if a good alternative can be produced—and it has been suggested by previous speakers here—then I think the Senate committee and the House committee should give those possibilities every possible consideration.

What I wanted to say here today has largely to do with the economics of the participating projects. Because if there is a burden to be placed on the taxpayers of the country in connection with this, it has to do with the participating projects. And so far as I have been able to ascertain from my brief reading of the testimony that has been produced here, there has been very little attention given to the economics of these participating projects.

I have here, Mr. Chairman, a copy of the individual project reports that were made by the Bureau of Reclamation in describing these different projects in their various aspects. And such figures as I will produce here have been taken from this report and are supportable thereby.

I want to deal with some individual projects, and then I will get to the general costs, if you please.

One of the projects which is in this bill, the Colorado River storage projects, is the Eden project in Wyoming. I have in my hand here a printed copy of the hearing before the Committee on Interior and Insular Affairs, 81st Congress, 1st session, on Senate 55, to provide an appropriation for this project. I am going to read some of the testimony therefrom.

On page 8, we find a Mr. Goe, attached to the Department of Agriculture, testifying.

Senator KERR. What is the growing season?

Mr. GOE. The growing season is rather short in that area, because it is a high-altitude area. However, the yield of those crops adaptable to that area is quite satisfactory, that is, oats, barley, alfalfa, hay, and grasses, which produce quite well.

Senator WATKINS. What is the elevation there?

Mr. GOE. Sixty-five hundred feet.

Then on page 9:

Senator MILLER. Well, at that elevation, wouldn't you get frost practically every month in the year?

Mr. GOE. It is possible to get frost in any month of the year.

Senator ECTON. And snow, too?

Mr. GOE. Snow, too, and low temperatures.

Senator KERR. Your average growing season would be 90 to 100 days: would it not?

Mr. GOE. That is right.

The CHAIRMAN. That is possible, but not very frequent, I would say to the Senator.

I will not read all of this testimony, of course, but it had to do with the values that are going to be established on this project and the cost of the improvements. And it has been testified that the Interior Department was going to spend something like \$3 million, and the Department of Agriculture \$1,300,000, and so this testimony:

Senator ANDERSON. Now, will the Department of Interior tell me whether, when you get through spending \$3,375,000 on 7,500,000 acres of land you plan to assess the farmer for agricultural benefits of about \$75 an acre?

Mr. LINEWEAVER. That is right, sir.

Senator ANDERSON. That is all.

So if the farmer buys land he will spend maybe \$100 an acre to buy it. He will have maybe a \$75 debt against him. Would you regard that as a feasible project?

Mr. GOE. I think under the circumstances it is, yes, with that length of payment.

Senator WATKINS. Now may I inquire what the \$75 takes in? Is that both the agricultural charge and the reclamation charges?

Mr. GOE. No, that is the reclamation charge.

Senator WATKINS. What is the agricultural charge going to be? How much an acre are you going to charge if you spend \$1,340,000 to take care of this 8,500 acres of land that you say you are going to take care of and level up?

Mr. GOE. We have estimated we probably will recover from the operations of the Department \$373,000.

Senator WATKINS. \$373,000 out of an expenditure of \$1,340,000?

And so forth. I am leading up to getting at the cost of this. On page 43 of this document, there is this conversation:

Senator WATKINS. Mr. Chairman, while these gentlemen are here, if they are going to put that statement in referring to the Bureau of Reclamation and the Department of Agriculture, I would like to remind them that out in Utah we have probably a million and a half acres of ground which, if it gets the same treatment you are according to this Eden project in Wyoming, would all be feasible for improvement. I refer to the Uintah Basin. Some of that land is pretty good land, but it cannot justify the cost per acre that would come under a regular project, even after you make allowance for flood control, power, and all the rest of it. So I want you to keep that in mind as to anything we propose for the Uintah Basin in Utah. We would like the same kind of treatment on a subsidy basis, on the ability of the farmers to pay, that has been given in this instance.

Now, this Eden Valley project, to which reference has been made here, is a project that has been established, oh, for 40 years or more. It has had very many ups and downs, and is brought out in this document, and elsewhere. And so when this proposal here to spend something in excess of \$7 million on that project came to my attention, I made some inquiry.

There was testimony in here that the new land proposed to be irrigated would, when the water had been taken to it by the Bureau and the land had been leveled by the Department of Agriculture, would then, in that State, without further improvements, be worth about \$100 an acre. It was very cautious testimony, I am sure, as you would observe if you read it.

I was interested, when I read that, because I thought I knew a little bit about that project. So I called a friend of mine in the banking business out at Rock Springs, Wyo., and, without revealing why I was asking the question, I asked him:

What is the going value of improved farms in the Eden Valley project?

He said:

I remember a couple of farms up there which changed hands this last summer at \$85 an acre.

I asked him further:

You mean a farm, improved with a house, barn, fences?

Yes.

Since that time, and more recently, I have made inquiry about the values of those lands, and I get estimates all the way from \$50 an acre to \$85 an acre. And I am speaking about going farms, improved farms, in that area.

In this Colorado River storage project, there is another one in my State called the Lyman project, wherein it is proposed to furnish supplemental water to forty or forty-one thousand acres of land now

in cultivation. So I asked this banker to give me in writing, if he would, something with respect to values in Eden Valley and in Lyman. And I am going to read to you from his reply. I am quoting.

Appraisals in Eden Valley are from \$80 to \$100 an acre for the best places, the value depending somewhat of course, on the types of improvements. Recently one of the better places in the valley was appraised by a life-insurance company for a loan of \$80 per acre. * * *

In the Lyman area I understand that the cropland is valued at about \$50, and irrigated pasture at about \$50 and brushland adjoining the irrigated or cropland at about \$3 per acre.

Following receipt of this letter, I got in touch with a couple of friends of mine out in that area and asked them to tell me what was the going value of land in the Lyman district. And I received estimates over the telephone varying from \$50 to \$85 and \$90 an acre. And those, I remind you again, are going, improved farms.

Now, in this description of the individual projects of the Bureau of Reclamation, referring to Lyman, and I quote :

Only grasses for hay and pasture, alfalfa, and some small grains, can be produced to any extent, as the growth of most other crops is precluded by a short growing season and untimely summer frosts, that characterize the high 6,500- to 7,000-foot elevation of the project lands.

So you have there, Mr. Chairman, a limitation, climatic elevation, short growing seasons, upon the values you can establish in that kind of an area.

In the case of the La Platte project in Colorado-New Mexico, the Bureau of Reclamation says:

Agriculture would continue to center around the livestock industry, with most of the irrigated area producing livestock feeds.

In the matter of the La Barge project in Wyoming, the Bureau states, and I quote :

Project lands would generally be utilized for the support of livestock enterprises; climatically adapted crops, such as hay, small grain, pasture, and some garden crops, would be produced.

The descriptions of the lands embraced in these participating projects which I have read go all through these detailed descriptions of the participating projects, and I would ask, if you please, when you have the time and opportunity, that you investigate those quite thoroughly; because they have a very great bearing upon the overall costs of this project to the taxpayers and the purchasers of power; the taxpayers of the country generally and the purchasers of power in the Colorado Basin if and when they are established.

It is proposed, Mr. Chairman, that there will be, according to the formula which was presented to the House committee in the hearings on the House bill, that the allocations to power, the cost of construction of the power features of the project, will be paid for out of power revenues in 44 years, and thereafter, in 6 years, the allocations to irrigation to be paid from power revenues will be paid. In other words, in accordance with this formula, there will be no payment upon that part of the irrigation costs which are allocated to power, 44 years.

I think you will understand that in our scheme of things here, particularly as they are today, we are operating this Government on a deficit basis. We are building up the national debt. I read in the paper this morning that the President was about to ask Congress for

an increase in the national debt limit from \$275 billion to \$290 billion. I assume that is necessary.

It is understood, by those of us who have studied the problem, that it costs the Federal Government about 2½ percent to hire money; and when we operate as we are today the Government has to hire a lot of money. So I think it is consistent that we examine this project in the light of the fiscal situation in the country and the situation which confronts the taxpayers of the United States.

I have written a memorandum here, which I propose to read into the record.

Under the provisions of H. R. 4449 it is provided that \$263,041,900 shall be assigned to irrigation for repayment from power revenues. According to the formula presented to the House committee by Interior, the power investments shall be repaid in 44 years and thereafter (and in 6 years) the above sum allocated to irrigation shall be repaid. On the accepted premise that moneys are costing the Government 2½ percent in interest—this would mean that said sum assigned to irrigation would grow to \$780 million. Interest on the unamortized balances over the said 6-year period would amount to \$23 million.

In other words, there would be a charge against irrigation of \$803 million. This minus the \$263 million to be repaid from power revenues would leave \$540 million, or \$2,700 per acre. This would account for a charge of \$432,000 per 160-acre farm and all of this would be general taxpayer-paid subsidy as it has no bearing upon the small amounts which would be repaid by the water users.

There is no method of determining from Bureau presentations a differentiation between new and supplemental water. It is provided that there shall be approximately 132,000 new acres and 234,000 supplemental. According to competent water engineering authority this would be the equivalent of 200,000 new acres for which water would be supplied. This \$540 million subsidy at 2½ percent would break down to \$13,500,000 per year, or \$67.50 per acre, a perfectly fantastic figure.

Now we have a little different picture when we consider the Senate bill, which you must, of course.

Senator WATKINS. You were going to tell us about some of the flood-control projects, where they do not get any of it back by direct repayments.

Mr. MILLER. I will tell you about that, and tell you what I think about them.

In the Senate bill there are a number of projects which were deleted from the House legislation. I have reference to the San Juan and Navaho in New Mexico, and so forth. And so I have taken the same kind of a consideration and broken that down, and I find this, Mr. Senator, that in the Senate bill the participating projects would be reimbursed from power to the extent of \$553,906,600 direct and \$107,500,000 as their share of the three dams, making a total of \$661,406,600, which, for 44 years, would have to draw interest in the Federal Treasury, because that money is going to have to be put up at the construction stage in cash. That is not in deferred payments. That construction has to be paid for in cash, and cash costs us interest these days.

Now, at compound interest for 44 years, that is \$661,406,600 at 2½ percent, which would amount to \$1,960,277,000, of which \$91,941,500 only is to be repaid by the water users, leaving \$1,868,335,500 as the cost to the United States. Of this amount \$599,304,100 would be repaid by power, leaving \$1,269,031,400 to be paid on this interest by the taxpayers. This \$599,304,100 to be repaid by power revenues would be collected over a 6-year period. Thus, there should be added

the interest on the unpaid balance for 6 years. This would amount to at least \$208 million, thus making the total subsidy about \$1,477 million, or very close to \$1½ billion. In all the projects there would be 294,000 acres of new land and 469,000 acres of land with supplemental supply, or the equivalent of about 500,000 acres with a full supply. Thus the total subsidy is about \$3,000 per acre in terms of new land.

Now, I submit, Mr. Chairman, that that is a burden which we cannot consistently ask the taxpayers to assume. I am talking here about the cost of these participating projects.

I told you about a survey which I made of established values, and I find this as to going farms today for which these supplemental waters are to be furnished, the average value. Now, they are scattered. They are most of them at high altitudes. They are limited by climatic conditions to a short growing season. But the average growing values of established farms today are around \$100 an acre, in many cases less. And, inquiring around, I seemed to be able to establish that if we place this water where it is proposed, we still cannot build a value in excess of \$150 an acre.

Now, if we are going to establish farms which cannot be sold for more than \$150 an acre, and even considering the indirect benefits—and at this point let me say that inquiry develops that as a general figure the Bureau considers that the indirect benefits are about 60 percent of the direct benefits. So if we take into consideration all of the direct and the indirect benefits, we are going to have a subsidy for these lands when we consider the money that has to be paid for interest over this 44 years, of a figure that in my estimation cannot be justified by any stretch of the imagination.

So that gets me around to discuss: What are you going to do?

And I know the question will be asked of me: Well, if you are not going to use this water for irrigation, what would you suggest is going to be done with it?

At this point I want to submit for the record an article which appeared in the Rocky Mountain News, dated the 20th of June, by a special writer, the title of which is "Colorado Basin Holds Treasure Chest of Ores." And I will not take the time to read this in full. But this gentleman paints a very fine picture of the mineral resources which are available in the upper Colorado River Basin, which he says up to last year produced more than \$3,300 million worth of minerals in what he terms the free world's greatest single treasure chest of natural resources.

Here is one of the statements he makes:

Bituminous coal reserves, estimated at 400 billion tons, are equal to one-sixth of the world's known coal deposits.

That leads me to make reference to something that I understand was placed before this committee by two witnesses from Wyoming heretofore. Both of these witnesses are good friends of mine. I like them. I admire them. But I want to call their attention, and your attention, if I may, to something which apparently has been overlooked.

Both these gentlemen referred to the situation which confronts the coal miners at Rock Springs, Wyo., by the closing down of the coal mines out there. They are sorry for them. Something ought to be done for them.

Well, I think it ought to be noted that if there is a demand out in that region for a considerable output of power, and that demand is supplied by the building of Echo Park Dam, the possibility of employment for those coal miners at Rock Springs is forever closed against them.

(The article referred to is as follows:)

[From the Rocky Mountain News, June 20, 1954]

COLORADO BASIN HOLDS TREASURE CHEST OF ORES

(By David Stolberg, Rocky Mountain News Writer)

Buried in the vast upper Colorado River Basin, which up to last year produced more than \$3.3 billion worth of minerals, is the free world's greatest single treasure chest of natural resources.

That fact emerged Saturday when John H. East, Jr., regional boss of the United States Bureau of Mines, reviewed the basin's mineral outlook.

The fabulously rich and relatively undeveloped area sprawls across western Colorado, southwest Wyoming, northwest New Mexico, eastern Utah, and north-eastern Arizona.

STARTLING FACTS

Here are some of the startling facts disclosed by East Saturday.

1. Bituminous coal reserves, estimated at 400 billion tons, are equal to one-sixth of the world's known coal deposits.

2. The maximum potential of "several hundred billion" barrels of liquid fuels produced solely from shale in a comparatively small area of 1,000 square miles near Rifle is "many times" the proved crude petroleum reserve in the United States.

3. Concentrated in the bulging earth at Climax is about 85 percent of the world's known supply of molybdenum, critical toughening agent for steel products including a host of military weapons.

4. In addition to molybdenum, the upper basin is the greatest domestic source of uranium, radium, and vanadium.

5. The "tremendous upsurge of oil interest" is justified by petroleum reserves in the area. Thanks to increasing consumption and price leaps, natural gas also "appears certain" for a greater destiny.

TOP PROSPECTS

Based on those facts, East reported the "upper basin's mineral industry as a whole now is in a better position than ever before and its prospects are improving with each passing day."

East said production of all minerals except uranium and vanadium in Colorado was worth \$1,774,423,000.

Wyoming produced more than \$800 million worth, Utah more than \$620 million and New Mexico just short of \$100 million.

He said the basin's vast coal deposits largely are untapped because "the industry is becalmed in a sea of economic doldrums." He blamed the condition on competition from the oil and natural gas industries which have usurped coal's former grasp of large segments of domestic, industrial, and railroad markets.

East said the Bureau of Mines is operating a research pilot plant at the Denver Federal Center to develop new and inexpensive methods of mining, transporting and using coal and coal products.

He said a process developed in Denver, using coal in the combined production of electricity and chemical tars, is in use in the heart of the Texas natural gas fields.

OIL RESEARCH

He said the Bureau is also continuing basic research on the basin's oil and gas reserves for conservation needs and longer increased production.

East reported oil-from-shale commercial production will assume a major role in the United States fuel economy imminently. Factors are the continuing national demand for petroleum products at a rate "far above the peak demand of World War II," reduced oil-shale production costs, and a leap in expenses for exploring new petroleum wells.

The Green River formation in Wyoming and Colorado is the Nation's largest and richest shale reserve.

Mr. MILLER. Now, this further observation.

Reference has been made here to those vast deposits of coal out there. It is my information that with modern high-pressure generating machinery, power can be produced in steam plants if they are located at the source of the fuel at a very relatively low cost, very close to the cost of hydroelectric power, as a matter of fact.

If you have established that the Government needs to have that power out there for its purposes, and it would utilize steam plants, use up some of those vast deposits of coal, you would give employment for a considerable number of miners the year round—these miners who are undergoing such an unhappy situation.

Senator ANDERSON. Governor, are you familiar with the stability of hydroelectric rates compared with the stability of rates based upon other types of resources?

Mr. MILLER. I am not familiar, Senator. I am not an expert in those matters; so that the long time continuity of rates I wouldn't be able to deal with.

Senator ANDERSON. Well, let me put it this way. In the Four Corners area, which is a spot, as you know, where Colorado, Arizona, Utah, and New Mexico join, there are very substantial natural-gas resources being developed. Four or five years ago, before there was a pipeline in California, the prevailing rate for natural gas was about 2 cents a thousand feet.

The present rate is probably 8 cents, and in a few years it will be 10 cents, according to contracts already signed. And when natural gas was being taken into Salt Lake by the Three States Oil Co., a contract was signed, maybe a year ago, and I believe it starts at 13 cents and goes to 18.6 cents. Does that not have some bearing on what power generated by natural gas in a steam plant would cost? And would not coal be subject to that same type of fluctuation? Whereas with this hydroelectric power you can almost guarantee a 6-mill rate for eternity.

Mr. MILLER. Well, I will say this, in reply. I was not referring to natural gas. I was devoting my statement to coal, of which we have, as I say, very vast deposits there freely available. And my real reference is to bringing it to the attention of the committee, because the statement was put in the record here yesterday or some time in the last few days that this Colorado River storage project has something to do with the coal miners and their situation out in Rock Springs. And I am saying that if you have regard for the coal miner out there, you can't give them much consideration by this project.

Senator ANDERSON. Well, I can only say that more than 30 years ago, I started the development of a coal mine in New Mexico. I was younger then and had a little more enthusiasm perhaps than I have now. It seemed to me a very quick and easy way to develop an industry. It turned out that natural gas proved to be cheaper. Coal mining even in areas like Colfax County, N. Mex., has closed down.

Dawson, a flourishing community only a few years ago, is entirely gone. When you go up there you can find hardly a trace of that town. I think there is one building left. It was a town that was one of the most flourishing communities in New Mexico.

When that happened, many of us tried to get a big plant located there for the generation of electric energy. It was my impression that electric energy could be generated at the mouth of the mine by these new methods and with new machinery cheaper than any other sources of power, and the REA people were looking for a cheap source of power.

The next thing I knew, it was proposed to put the plant to Velarde, N. Mex., which is on the Rio Grande at the end of a very sharp canyon, and their thought was they might be able to use natural gas and water power combined. And the next thing I knew it was located down closer to another New Mexico community called Algodones, where it is now solely a natural-gas plant.

In other words, here was a group seeking a cheap source of fuel, and they looked at coal and passed it up, and looked at some other locations, and finally came to natural gas.

I think the rates for natural gas eventually are going to be far higher than the rates for coal. But nonetheless, the coalfield closed down. And it is a mighty difficult proposition to set up these plants for the utilization of coal.

I think the Rock Springs coal miners would have many years of uninterrupted labor, if you were trying to generate from that area, before these hydroelectric plants can be built; because most of them won't be in operation for many, many years.

Mr. MILLER. Senator, don't misunderstand me. I am not saying that we should go out there and build these steam plants.

I am saying that if there is any relief for these coal miners in sight, that we are told about before this committee, it will not come from the building of Echo Park Dam. I am not contending that hydroelectric should not be built. I am just saying that coal miners will wait a long time to get any coal dug out there if they depend on that premise.

Now, the Senator asked me a moment ago what I would think about something. He assumes that my attitude here is rather critical about this business of spending all this money on these irrigation projects, part of which will be repaid from power revenues.

Senator WATKINS. I think that assumption is borne out by what you said.

Mr. MILLER. I agree. I am very critical of it, because of the amount; not because of the principle but because of the amount.

Senator WATKINS. I want to know this, too. Are you pretending to speak in behalf of the power users? You say they have to subsidize a lot of this.

Mr. MILLER. No, sir. I am not speaking on behalf of them. I will try to explain myself.

Senator WATKINS. Well, are you feeling sorry for them?

Mr. MILLER. You raised the question as to what I thought about these nonreimbursable flood-control projects, and I want to talk about that a minute.

Senator WATKINS. All right. You go right ahead. And then I want to ask you if you are feeling sorry for the power users in this area. I do want to call attention to the fact that if your observation with respect to the generation of electricity by coal as a fuel is correct, then the power companies in the States of Wyoming, and Colo-

rado, and New Mexico, and Arizona and Utah do not seem to know their business too well, because all of those States except Arizona and possibly New Mexico have all that open for them and yet they are perfectly willing to come in and offer to buy the entire output of all these projects.

Mr. MILLER. That is right.

Senator WATKINS. And, of course, if they could do it cheaper with coal, I think they would be very unwise businessmen, and no one has ever criticized them for being unwise in the operation of their business.

Mr. MILLER. I do want to give attention, because it seems to be a proper place, to your reference to the fact that flood-control projects are provided without reimbursement; which is true. And for your information or for whatever it may be worth, just a couple of days ago, I spoke in Portland, Oreg., to a group there and called attention to some of the angles of this nonreimbursability of flood control, with which I disagree. I contend, Mr. Senator, that the beneficiaries of flood-control projects should participate in the financing of the construction costs just the same as our irrigation farmers participate in the construction costs of those enterprises.

I think in principle there is no difference. We have gotten a long, long way away from the considerations which entered into the establishment of navigation on rivers, and so forth. We have gotten a long way away from the original principles of flood control. Because now flood control is nearly all applicable to the protection of established values, established land values and industrial values. And if we wanted to take the time here, I could give you a number of instances that have come to our attention of the inconsistency of this proposition, that all flood-control benefits are nonreimbursable. And the same applies, if you please, to navigation, in my judgment. But that does not have any place here.

Senator WATKINS. As I remember, they have had many billions of dollars for flood control, none of which has been repaid by private people who have their own interests involved, and which are directly benefited by these flood-control projects.

Mr. MILLER. Yes.

Senator WATKINS. Of course, if you would go on and compound the interest on the money spent there in addition to the principal, you would have an astounding, fantastic, figure, too, would you not?

Mr. MILLER. That is right, and I do not agree with it.

Senator WATKINS. Well, that has been the established policy of the United States, and you are one of the first men that I have heard occupying such a position of prominence, outside of some of the Senators and Congressmen from the West, to carry the flag.

Mr. MILLER. Well, I am perfectly willing to carry the flag on that, but in my opinion, this is subject to grave consideration by the Congress.

Senator WATKINS. Well, I think it should be considered seriously by the Congress. I note that you made reference to the Eden project and the participation I had in those hearings.

Of course, if the State of Wyoming wants to put the water that is allocated to it by the Colorado River Compact for use on farms, that

ought to be the business of Wyoming. Wyoming has recommended the Eden project. If you were just going to take the Eden project all by itself and stand it out here, you could say, "That does not seem feasible." But when you consider the fact that the waters of the Wyoming, in order to have title to them finally, must be put to a beneficial use, Wyoming would be wise and the people of that State would be wise if they would all say, "As far as we are concerned—and it should not be anyone else's business as long as we pay our way—we are willing to pay back the costs of this project, the power users, and also the farmers."

On the average, farmers pay more money per capita for power than do city people. "We are willing, as power users and general taxpayers in the community, to go the limit in getting this water put to a beneficial use in our state. Our rights have been approved by the 1922 compact; then a compact was entered between the upper basin States, allocating my State its share of the Colorado River."

I have no quarrel with them if the taxpayers and conservancy districts and power users, the whole group up there, say, "As a cooperative effort, we are willing to shoulder the cost of this in line with the existing policies in the United States." And, of course, if they do that, and it is a cooperative effort, it really should not be anybody else's particular business if they pay back according to the general policy. If you want to attack the reclamation policy which has been in effect for many years, that is another matter.

Mr. MILLER. That is what I am doing.

Senator WATKINS. You are attacking the policy adopted in 1902 that the farmers, the irrigators, should be required to pay only the principal without any interest on these projects?

Mr. MILLER. No, Senator, I am not attacking that principle. As I explained earlier, I am not attacking the principle of subsidy, because that has, as you say, been established over a period of years. We have this arrangement that the farmer pays a part of the cost of construction.

Now, in the case of these participating projects in the upper Colorado storage project, he is only going to pay about 10 percent of the construction costs, and the rest is to be paid from power revenues.

But what I was particularly calling attention to here was the huge subsidy that is attached to this proposition on the formula that nothing will be paid on irrigation for 44 years. That will be deferred until all the power construction costs are paid for. And so this huge cost allocated to irrigation will, for the purposes of the United States Treasury, be called upon to pay two and a half percent interest, because that is what we pay for the hired money.

Now, getting to what you said about the people of Wyoming, if they want to use this water on projects of this kind, why should anybody else be worried? In the first place, Mr. Senator, let me say to you this, that if you had a proposal here that the State of Wyoming and the people of Wyoming directly paid for a part of this project, I perhaps would be in a little different position.

Senator WATKINS. Well, we do that in most of the conservancy district that are organized in connection with these projects. You know how a conservancy district works, do you not?

Mr. MILLER. I know how they work.

Senator WATKINS. The general taxpayers pay part of the costs through a tax levy for that purpose.

Mr. MILLER. That is right.

Senator WATKINS. And all the people in the area pay all the costs, and it does not matter whether they are labeled "power" or "water" or "general welfare" for that community. They are all water users and power users. They pay the total bill no matter how it may be divided or labeled.

Mr. MILLER. But, Senator, my premise is this, that giving recognition to the fact that we have an established policy that we subsidize irrigation, we should take a look at the size of that subsidy and see whether it is justified in the light of the general economy of the country.

I have produced here some figures to show what that subsidy is going to be, as paid by the taxpayers of this country over this 44-year period when the power construction is being paid for.

Senator WATKINS. There will be some paid during that period of time.

Mr. MILLER. By the irrigators?

Senator WATKINS. Yes.

Mr. MILLER. Their small payment will be paid during that period. But none of the cost of construction, according to that formula. Now, you may take a good look at that, in this Senate committee, and find a different method of treating that. But that is the way it stands now.

And the thing that I want to establish here—because I think that the people of Wyoming, as well as the people of the country generally, are entitled to know what is going to be the actual cost of this kind of irrigation.

I read into the record a number of descriptions of these different parcels of land, and the whole thread runs through just about the same. And I established here that the going values of established farms as of today are around \$100 an acre in those areas. We might build them up to \$150 an acre. But if we subsidize them, Mr. Senator, at \$2,700 an acre, whether the difference between \$150 and \$2,700 comes from taxpayers' direct payments in taxes, or whether it comes from purchasers of power, what is the effect upon the general economy of the country?

Let me say this. If you go out in Utah and buy a farm, and you pay for that farm \$500 an acre, you will buy it at that price based upon its productive value. If you pay \$150 for a ranch, you will buy it upon the basis of its productive value over an established period. If the established value which you will pay for that ranch is \$150, and then for irrigation we come along and subsidize supplemental water to that place at a cost to the taxpayers of this country of \$2,700 an acre, is not the difference between \$150 and \$2,700 lost to the economy of this country?

Senator WATKINS. No. I would say flatly "No." After all is said and done, you have overlooked one important element in every one of these areas. You have overlooked the income tax that is paid by the general prosperity of the area and by the people in that community. And I do not mean just the water users alone.

Mr. MILLER. I understand.

Senator WATKINS. I know that many times in order to have a community at all, we have to, some of us have to, help in a cooperative

way with the burdens of the others. I can call your attention to a very common practice in my State, and I am sure a common practice in your State. Take, for instance, the canal that diverts from the Provo River just about a half a mile from a farm that I have. I am one of the first water users to take out of that canal. The cost of getting the water to me that distance is rather small as compared with the cost of getting the water to the farmers on the end of that canal about 10 miles farther west. Yet I pay identically the same operation and maintenance, and I had to pay the same cost, proportionate cost, of that construction, on an equal share with each and every shareholder for the entire distance. People say that is not fair, that I am subsidizing the people on the other end of the canal. But that has been a common practice out there. Of course, there would not be any irrigation projects at all unless there were that kind of an operation. I am helping to pay for the last man on the canal.

Mr. MILLER. I understand that.

Senator WATKINS. Now, we have this overall cooperative basin program. And the people themselves want it this way; except a few people occasionally who come in and say the load is too heavy. But very seldom are they the people actually living in the upper basin States.

The overall use of power in industry for homes, for the municipalities, and the use of water there, all these are worth a lot to all the people of the States in the basin. And the money that the conservancy districts would collect from the general taxpayer, realizing that there are benefits that the water user should pay alone, is in payment of the benefit that comes to that community by having the water there. Because if the time ever comes when the population growth is too great in the urban areas and they do not have enough water, they can always take that water from the farms for the benefit of human consumption under State law. They have a higher priority over the water for domestic use than for irrigation or even for industry. But the water is there, and they have it, and they can move it. And that is worth a lot to those people.

Mr. MILLER. I understand that.

Senator WATKINS. The general income tax, for instance, on some of those projects, is far greater than the actual payments required.

We have a project in Utah known as the Echo project. That has nothing to do with Echo Park. It is on the Weber River. That Echo project has, as I remember, had an increase in income from a million and a half a year up to 14 million. Mr. Larson was telling about the income and how that had been increased by putting the supplemental water on the farms, and it increased from an income of a million and a half a year up to 14 million. So the Government itself is not far out.

It has been suggested by some—I don't approve of this, however—that the Government can put the water out and say, "You can use it, pay the operation and maintenance, and that will be enough. We will get our income out of the general prosperity of the area that comes from income taxes."

In the past, they have made the irrigator carry all the burden of developing water for the farms and the community. You say, "We are going to have power. We are going to use all this power for in-

dustry. We are going to forget this matter of irrigation." Well, you just cannot have communities without water. And in order to get the water, you have to provide the means of getting it there and using it for all purposes. They interlock.

Mr. MILLER. I want to make reference to the implications of one statement there, Senator. You say that because these projects produce income taxpayers we are justified in subsidizing the work.

Senator WATKINS. That is one item that ought to be considered.

Mr. MILLER. But I think, Senator, when you analyze it carefully, you would have to carry that out to a logical conclusion. Because any development will produce income taxpayers. In the State of Utah, for example, if you went out and established a new copper mine, that would build a town or it would make taxpayers, but you do not give consideration to subsidizing the establishment of that copper mine.

Senator WATKINS. I think the copper mine would have a difficult time getting by if it did not have water for the people who were going to work in it.

Mr. MILLER. That is true, and if you were going to take all of this water now and tie it down to specific purposes under our appropriation laws, what is the industry going to do for water hereafter?

Senator WATKINS. The land could always be purchased together with the water rights. That is a complete answer to what you just said.

Mr. MILLER. It would provide quite a little litigation in the courts.

Senator WATKINS. Not necessarily so. Because, for instance, if you said a full water right applied to that land, and the land and water combined, would come to \$150 an acre, there would not be a farmer that would not sell if you offered \$200 an acre.

The right has been established to the consumptive use of that water. It is to be diverted from the river and stored. It is not going to be wasted.

We either have to stop expanding and increasing our population in those States, or we have to make provisions for the needs of those people as I have said.

Our power users, who are the same people who will till the farms and pay the bill—are willing to do that sort of thing. All we have said to the Nation is that "Since you are willing to give the flood-control people the benefit of having the water kept off their lands without requiring repayment of the construction costs, you ought not to ask any more of us than the principal, on the portion of this project charged to irrigation."

Mr. MILLER. As I explained, Senator, I do not ask the people to do that in flood control. They ought to pay their way the same as other people.

Senator WATKINS. I know you do not, but your voice will be the lone one in the wilderness here. I understand Mr. Hoover and some of the rest have suggested that same thing. I have been crying it to Senator Douglas every time he comes up and objects that the taxpayers are subsidizing a reclamation project. It has been going on year after year since he and I have been here. Finally, the last time, he said, "I have got the best of you now. I have introduced a bill in which I am going to require the people who get the benefits out of the flood-control project to pay half of the cost."

Mr. MILLER. I am for you.

Senator WATKINS. He should not stop at one-half. He should require repayment of 100 percent of the construction cost. We have had that policy over the years, and as far as we were concerned, we have had to take the things the way they were.

We want to put the water to a consumptive use, and if this program will not do it, we would be glad for someone to come up with one that will. It has been under study, as one witness said, for nearly a hundred years. I know it has been under study ever since I was a small boy, and I am not revealing my age, but I know that is quite a long time.

Mr. MILLER. Well, Mr. Chairman, I want to say this, that I do not think that the use of water out there is going to stop if we do not get this project. I think that it will be slower. But I have every reason to believe that there will be small projects here and there, justifiable on a local basis, that will be brought in from time to time, and the irrigation will expand out there.

We have developed, as you know, a very considerable advance in sprinkler systems of irrigation, so that irrigation is practical on lands which do not have to be so level as we have always considered under the irrigation projects. And it is my judgment that from time to time we will have these small projects worked out on the basis of local effort and cooperation and financing, and it will be no burden to the Treasury of the United States.

Senator KUCHEL. Mr. Chairman?

Senator WATKINS. All right, Mr. Miller.

Senator KUCHEL. Mr. Chairman, may I make one comment to my good friend from New Mexico? I only want to say this: the people of California are in favor of the development of every State in the Union. The representatives of California in testifying here, later today, I hope, are endeavoring to find what the facts are.

Our State is involved in litigation. We have been sued. There are questions that have been raised in the hearings in the House of Representatives relative to exchanges of water under the project as contemplated in this bill which the representatives of the people of our State, my good friend Senator Chavez, want to explore, want to get the facts on.

While we want to use no one else's water, by the same token we want to be sure that that which is ours under the Colorado River compact will continue to be ours in a fashion that can be put to beneficial use and consumptive use in California.

Senator CHAVEZ. I think I could agree with the Senator from California. But the fact still remains that Utah owns so much water, Wyoming so much water, New Mexico so much water, and until we have a project, whether we like it or not, it will go across the State line and be used by California.

I want California to get every foot of water that they are entitled to. But I also want California to be fair to us and let us have some projects in New Mexico and around there that even California has agreed belongs to New Mexico. But until we do, it is a practical proposition, 770,000 acre-feet of water crosses the State line at San Juan. That is more water, sir, than comes down the Rio Grande. It is New Mexico's water.

Until Congress takes action in authorizing this other, we are losing that water. You know, water runs down the river. Unless you stop it and put it somewhere, it is going to go down to California, to Boulder Dam, and be used elsewhere.

Not only that, Mr. Chairman, but look at the implications. The chairman knows that under Western law, and under the water law, that eventually, by the use of water, you can inure rights as to that water. Not only can the lower basin State take advantage of that, but even the Republic of Mexico can take advantage of that.

All we ask is that Congress be fair, and let us have some projects in New Mexico, Wyoming, Utah, and Colorado, and let us use that water.

Thank you, sir.

Senator WATKINS. Governor, I suppose you are just as opposed to interest-free irrigation projects in California as in the Mountain States?

Mr. MILLER. Yes, sir.

I hold no brief for California. They can take care of themselves.

Senator WATKINS. Let's take a practical look at it. California has large irrigation projects already underway. They have them on similar terms, no interest.

Are we going to stop in the middle of the game, now that the upper basin has a solution to the very difficult problem of getting the water out of the deep river canyons and say, "Now, look at the subsidy you are getting, including compounded interest." That is the worst kind of a Shylock thing, because no State that I know about will permit compound interest.

Now that we get to the point where the upper basin is ready to go ahead we suddenly are confronted with the theory, "Look at the immense subsidy for the farms up there." You compound the interest on us and build up fantastic figures.

I am wondering if you think we should reverse the situation. Shall we go back to all of these reclamation projects on the Columbia, on the Snake, on the Missouri, and on every stream in the West, and say, "It is all a mistake, gentlemen. You have to go back and pay interest on construction costs on all of those projects. We are going to do that, because we are going to make the upper basin States do it before we will allow them to have a project there."

Mr. MILLER. I am sure you would not put words in my mouth as saying that we should do away altogether with this interest-free subsidy for irrigation. I tried to make that clear in my early remarks, that I am not contending against the principle which has been so long established. But I am saying that we are proposing in this project what I deem to be unfeasible, uneconomical projects, on which we will waste tremendous amounts of money.

We have in the upper basin unlimited opportunities, they may not be here today, but they will tomorrow, and I undertook to place in the record a statement as to the resources which are to be developed up there, and I have said also that I am sure that irrigation will expand there. It will be slow, yes.

But if you are going to subsidize at the extent these projects will have to be subsidized and the very limited values you can expect to build up—well, I was out there, Mr. Chairman, just 3 or 4 days ago, out in the Columbia Basin, where they were expanding irrigation

there, at low elevations with a different type of soil, generally speaking, than we have, and that is going to be a wonderful area, and they can build values up there, probably, as they can out in the Central Valley of California, to three, four, or five hundred dollars an acre, perhaps, because of the kind of crops they grow.

But I directed your attention to the limited type of production we can expect from this type of project. But you are going to be called upon to subsidize that type of land far in excess of the subsidies to those other lands that I speak of in Washington and California.

Senator WATKINS. I think you are charging too much, Mr. Miller, to the lands. The lands are one means of getting the water right nailed down, and I think the State itself realizes that.

Your statement is inaccurate when you say so much spent on that land, because part of that money spent in getting that water developed, that would be charged to the land, would actually be of direct benefit to the general area.

Mr. MILLER. To the extent of the portion of the construction cost that is assumed by the irrigator and such additional as may be in the conservancy district of which you speak.

But let me call your attention, Mr. Senator, to the fact that the conservancy district is responsible only for that part of the construction costs which are chargeable to the irrigator. He has to get in there and support that.

Senator WATKINS. For instance, taking the central Utah project, you will have 18 counties that might eventually have to go into a conservancy district, and those taxpayers will vote at an election to set up a conservancy district.

Under the State law, at the present time, they tax themselves to pay for this project, as compensation for the indirect benefits which they receive. We have done that on a statewide basis and even on a nationwide basis.

What is wrong with the United States taking over part of the costs where it gets part of the benefits, the same way as the cities, towns, and counties and other tax units of a State would take it over? Why not?

Mr. MILLER. You have to carry that to a logical conclusion, and if you are going to have the taxpayer generally of the United States financing one project out there because it contributes to the economy, you have to carry it to other projects and not confine it to irrigation.

Senator WATKINS. That is probably what will happen. It is expanding more and more. We have reclamation projects where a large part of the water goes for industrial purposes. In my State that is true. The Columbia Steel Co. was made possible by a reclamation project. It had to have some 20 second-feet of clear mountain water for consumptive purposes in the making of steel.

That was in the war. The Navy had to have ship plates and that was one reason why they built that great steel plant in Utah county. It was possible to get water to that plant through a small reclamation project which had as a part of it a mountain lake, a mountain reservoir in Provo Canyon.

They brought that water down and used it to make steel. That can go on and expand and expand. But the combination of the water and the power lets us have industry, homes, and food for the people of this expanding population that we have, and I think you have overlooked that.

The United States has a stake in that as well. We can go on and make for this expanding economy if we adopt these cooperative, basin-wide, riverwide programs.

Some of them may look big, and some people would say, "What a whale of a subsidy for that project." But it has been determined that the project is feasible even though the people 10 miles from the river may be heavily subsidized by the people close to the river.

It has never occurred to us that we should not make that kind of a subsidy, even when it came to considerable money, and we have all gone along on it.

Mr. MILLER. I contend, Senator, your logic or theory is all right if it is applied to projects which can be considered feasible, as I say, and economic, and that will in the end pay out and really make a net addition to the general economy.

I contend that these participating projects will not. At this point, because of your reference to compounded interest and the figure that can be built up, my understanding is that that is the way the Treasury operates on these costs. They use a compounded interest calculation.

I want to insert in the record here two tables which will give the per acre cost and the cost per 160-acre farm under these participating projects, which has no reference to interest. It deals only with the construction costs and deals with the full supply and the supplemental supply.

I offer these for the record in order that those who study this can ascertain the costs of these projects.

(The documents are as follows :)

UPPER COLORADO RIVER STORAGE PROJECT

TABLE 1.—Participating irrigation projects (H. R. 4449) average capital costs (no interest costs included)

Project	Irrigated acreage		Estimated cost, January 1953		Share of 3 dams ¹	Total	Total cost per acre	Cost per 160-acre farm
	Full supply	Supple- mental	Total					
			Total	Irrigation allocation				
Paonia (Colorado) (partially authorized)	2,210	14,850	\$6,944,000	\$6,791,600	\$4,952,000	\$11,743,600	\$689	\$110,269
Central Utah (initial phase)	28,540	131,840	231,044,000	127,354,000	46,604,000	173,958,000	1,065	173,546
Emery County (Utah)	3,630	20,450	9,895,500	9,636,500	6,997,000	16,633,500	691	110,522
Florida (Colorado)	6,300	12,650	6,941,500	6,503,600	5,507,000	12,010,600	634	101,408
Hammond (New Mexico)	3,670	-----	2,302,000	2,302,000	1,066,000	3,368,000	918	143,834
La Barge (Wyoming)	7,870	-----	1,673,300	1,673,300	2,316,000	3,989,300	500	80,082
Lyman (Wyoming)	-----	40,600	10,564,000	10,564,000	11,798,000	22,362,000	551	88,126
Pine River extension (Colorado-New Mexico)	15,150	-----	5,027,000	5,027,000	4,402,000	9,429,000	622	99,581
Seedskaadee (Wyoming)	60,720	-----	23,272,000	23,272,000	17,645,000	40,917,000	674	107,818
Silt (Colorado)	1,900	5,400	3,356,000	3,282,400	2,121,000	5,403,400	740	118,480
Smith Fork (Colorado)	2,270	8,160	3,367,000	3,343,000	3,031,000	6,374,000	611	97,779

¹ Glen Canyon, Echo Park, and Curecanti Dams.

TABLE 2.—Participating irrigation projects (H. R. 4449) weighted capital costs, interest excluded (supplemental acreage allocation assumed at one-third that of new acreage)

Project	Share of 3 dams	Total cost	Cost per acre		Cost per 160-acre farm	
			Full supply	Supplemental	Full supply	Supplemental
Paonia (Colorado) (partially authorized).....	\$3,620,200	\$10,411,800	\$1,456	\$485	\$232,894	\$77,632
Central Utah (initial phase).....	36,681,300	164,035,300	2,263	754	362,078	120,693
Emery County (Utah).....	5,286,600	14,923,100	1,428	476	228,554	76,184
Florida (Colorado).....	5,322,000	11,825,600	1,893	631	302,880	100,960
Hammond (New Mexico).....	1,857,200	4,159,200	1,133	-----	181,326	-----
La Barge (Wyoming).....	4,033,000	5,706,300	716	-----	114,555	-----
Lyman (Wyoming).....	6,848,200	1,412,200	-----	429	-----	68,619
Pine River extension (Colorado-New Mexico).....	7,666,500	12,693,500	838	-----	134,056	-----
Seedakadee (Wyoming).....	30,726,700	53,998,700	889	-----	142,290	-----
Silt (Colorado).....	1,872,300	5,154,700	1,393	464	222,906	74,302
Smith Fork (Colorado).....	2,525,000	5,868,000	1,176	392	188,152	62,717

Mr. MILLER. I have to run in a few minutes, but in the meantime I am glad to answer questions.

I don't want to take anybody's time, but if you have further questions, may I listen?

Senator WATKINS. I have one observation to make in response to your statement that you were expressing the view of the Water Resources Commission of the United States and that this project should not proceed without further study by you. Is that what I understood you to mean?

You made a remark at the beginning that you were speaking for the Water Resources Commission.

Mr. MILLER. Yes.

Senator WATKINS. What was that, again? We don't have a copy of your statement. I want to be sure not to misquote.

Mr. MILLER. What I said was that as a participant in the studies of the Hoover Commission that I deem it unwise that legislation which touches as it does upon so many broad policies in the field of water administration as is encompassed in this project, should not be entertained by the Congress pending the making of the Hoover Commission report, with its recommendations with respect to long-range policy.

Senator WATKINS. Now may I inquire as to seeing what validity there is to that? There may be some. How long do you think it will be before you give that overall report for the United States?

Mr. MILLER. It is due the 31st of May, next year.

Senator WATKINS. Have you studied this legislation?

Mr. MILLER. This legislation?

Senator WATKINS. Yes.

Mr. MILLER. I read it very carefully.

Senator WATKINS. You note that it requires, at least the proposal by the Bureau of the Budget and I think it will be adopted in this bill—this bill was drawn before we heard from the budget, before we had heard from the Secretary, as a matter of fact—that there will be a study of the economic situation, the economics of the project, I will put it that way, and it will be authorized upon the certification of the Secretary of the Interior that it is satisfactory from the standpoint of its economics.

If that is going to have that recommendation in May it will be quite a long time before we could get anything rolling on an authorization. Congress would have to meet again. There would be no money to start work on any of these projects, Glen Canyon, or Echo Park, or any of the rest of them, for some time.

Mr. McKay will have that opportunity, and the Congress will have that opportunity, if and when they get to the appropriation stage. We have come to the conclusion in the Congress that we simply can't wait on commissions ordinarily to make the next studies and make their recommendations, because on the whole the commissions go a long, long time before they make a report. If you make your report in May, that is going to be a record. I mean next May.

Mr. MILLER. Well, I am sorry. I would like to visit with you longer. Maybe I will have another opportunity.

Senator WATKINS. We will be in short recess.

(A brief recess was taken.)

Senator WATKINS. The subcommittee will now be in session.

Mr. Packard, you are one of the representatives of the conservation group, are you not?

Mr. PACKARD. Yes, sir.

Senator WATKINS. I understand that the witnesses who were going to testify with you in that group will be satisfied to have their statements placed in the record in large type in lieu of oral presentation.

Mr. PACKARD. As far as I am concerned, sir, that is definitely true, providing that all of the documents we have submitted are also published. I think you should call on the others, though, to check that.

Senator WATKINS. I think, for economy, we cannot print all of the material. But we want to be fair about it, and print it in condensed form such as we can print in the record. We will agree to that.

Mr. PACKARD. I will agree to that, but I wish you would call the others.

Senator WATKINS. I will call the others.

Mr. Zahniser, do you agree to that?

Mr. ZAHNISER. I didn't hear all that was said, Senator Watkins. I have a statement.

Senator WATKINS. You are not the next witness. I merely want to know if you would agree to what Mr. Packard said.

Mr. ZAHNISER. I didn't hear what was said.

Senator WATKINS. He proposed that we place in the record in large type the statements of the conservation group.

Mr. ZAHNISER. My full statement as submitted will be printed in the record in the large type?

Senator WATKINS. That is right.

Mr. ZAHNISER. That is agreeable to me.

I wished also to file with my statement a couple of reprints to which I made reference in my statement.

Senator WATKINS. They will be filed with the committee.

Mr. ZAHNISER. But not necessarily made a part of the record?

Senator WATKINS. That is right. We don't ordinarily take those exhibits and put them in unless they are very pertinent to the statement.

Mr. ZAHNISER. My full statement would be published as submitted?

Senator WATKINS. That is right.

Now we have Mr. Claggett. Are you willing to do the same thing?

Mr. CLAGGETT. Yes, sir.

Senator WATKINS. That will be the same with you.

Mr. Charles H. Callison, is he here?

Mr. CALLISON. That is agreeable to me, Senator, and if I may have your permission also to place in the record a resolution for the National Council of State Garden Clubs.

Senator WATKINS. Of which date?

Mr. CALLISON. Pardon?

Senator WATKINS. A national organization is it?

Mr. CALLISON. Yes. I represent the National Wildlife Federation, but I have also a resolution adopted by the National Council of State Garden Clubs with me. They asked me to present that for the record. I should also like to have that in the record, and your assurance that it will be in the record.

Senator WATKINS. That is right.

Mr. Gutermuth?

Mr. GUTERMUTH. Yes, that would be perfectly agreeable with me.

Senator WATKINS. All right. You submit your statement, then, and we will print it in the record.

Mr. PACKARD. Also since I have not given these to you here are copies of my statements. The only other document was a letter and memorandum attached to this, and there is also this one document that clarifies very expertly by an outstanding attorney the meaning and intent of the Federal Power Act, and other laws, relating to the national park in relation to this problem. It is signed by Manly Fleischmann.

There are also two documents from the Solicitor of the Interior Department.

That is all I wish to place in the record.

Senator WATKINS. These briefs will be filed with the committee.

Mr. PACKARD. I suggest you study them. I think they would be very useful to the Senate.

(The statements referred to are as follows:)

**STATEMENT OF HOWARD ZAHNISER, EXECUTIVE SECRETARY,
THE WILDERNESS SOCIETY AND EDITOR OF THE LIVING
WILDERNESS**

THE ECHO PARK QUESTION

A statement by Howard Zahniser, executive secretary of The Wilderness Society and editor of the Living Wilderness, at hearings held by the Subcommittee on Irrigation and Reclamation of the Senate Committee on Interior and Insular Affairs, in the Congress of the United States, on a bill (S. 1555) to authorize the upper Colorado River storage project, including the proposed Echo Park Dam in the Dinosaur National Monument in northeastern Utah and northwestern Colorado, July 2, 1954.

Last summer, on a trip through Colorado and Utah, my wife and I, with our 15- and 7-year old sons and our 12- and 10-year-old daughters, camped at the mouth of Split Mountain Canyon, in the Dinosaur National Monument, motored and hiked on to Harpers Corner, and then returned and motored on down into Echo Park. There, along

the Green River, in that lovely grassy park, with its beautiful trees, across from Steamboat Rock, my wife cooked hamburgers and made a meal for us, while the children climbed on the rock slopes of the canyon wall and I wandered about, exhilarated and overawed—and perplexed, as I tried to understand the dam-building proposal that has focused so much controversial attention on this area of our national park system. I shouted across the river to Steamboat Rock, "Should we build a dam here?" The echo came back with my question still in it, "Dam here?" Unfortunately that question is still echoing, in the corridors of the Department of the Interior, in the White House, in the Halls of Congress, and indeed throughout the country. It is one of the great questions that face us in our efforts to cherish and use wisely the natural resources on which our own, our children's and our children's children's welfare depends. We here today must face this question in all earnestness, and I myself deeply wish to be of some help in reaching a sound answer.

It seems to me that in facing this question we must first of all try to realize what kind of place this is, for indeed it is not the dam that has provoked this echoing question, but rather its proposed site. What sort of place is it?

It most certainly is a place of great natural grandeur, and I myself have many times wished that I could somehow express something of its grandeur to my friends who ask me about it. Perhaps I have come closest to such an expression by suggesting also the nobleness of the Washington Monument.

Think of standing at the base of the Washington Monument and looking up at its grandeur. Imagine again the respect and admiration, the aspiration, too, which you feel as you place yourself before its 555-foot thrust into the sky. Think then again of a solid natural rock a hundred and fifty feet yet higher than the Washington Monument, towering above you like the prow of a great boat a mile long, its hidden mast a thousand feet high—a monolith of natural rock, golden and brown. Imagine the awe and wonder you feel as you place yourself before its massive stand against time and the elements—Steamboat Rock.

Think too of the river flowing against the side, winding around the prow of this great rock—the Green River that has come through the Canyon of Lodore and at Steamboat Rock has found its confluence with the Yampa—waters which have flowed through canyons which surpass, in the scenic superlatives of those who have known them, even this marvel of Steamboat Rock.

Then realize again that you and this high rock more than a mile long, with the river moving around it, and the park where you stand—all are deep in a wild canyon, and behind you as you turn are sheer walls of rock that sweep even higher than Steamboat Rock.

Climb out of these canyons onto the great plateau land in which they are cut. Walk out along the edges of the chasm, on Harpers Corner. Stand on this tongue of solid rock that holds you 2,000 feet above the river. And see the abyss to the right and left and straight ahead of you.

Turn right and see far below you Steamboat Rock that awed you in its presence. See the river flowing around it. Trace its course on up the stream, and the course of the Yampa River's Canyon as it winds to its confluence with the Green there in Echo Park.

Turn to your left. Find yourself looking straight downstream between the narrow walls of Whirlpool Canyon, and the rough river, deep in the chasm, so apparently quiet from your height.

Try to tell yourself that there before you, deep below you, the United States Bureau of Reclamation—your Bureau of Reclamation—wants to build a dam 525 feet high above that river. The Echo Park Dam. And up to its concrete foot would come the reservoir waters eventually of another dam—Split Mountain—inundating those whirlpool rapids.

Turn again to your right and imagine the reservoir waters of that impertinent dam below you. Imagine Echo Park inundated. See nothing of Steamboat Rock but a stone island in a storage basin deep almost as the Washington Monument is high.

Think of the rivers and the canyon-bottom riverside camp spots above Echo Park, buried in the waters of that basin—along the Green's marvelous canyon of Lodore, and along the deep meanders of the Yampa—that great gorge twisting through colored rock around unnumbered bends, loops, and curves. Think of the unique wild, river-running recreation in these canyons, the like of which is nowhere else, flooded out forever by miles and miles of a storage reservoir.

It seems to me, Mr. Chairman, that you thus have as good an idea as I can give you here of what I believe is the essential reason why the Congress should not authorize this proposed dam building at Echo Park:

It would destroy one of the unique, irreplaceable, scenic, wild wonders of the world.

This great beautiful area that you view from Harpers Corner and wherein you stood at Echo Park—this marvelous wild scenic area in our national park system is what the Bureau of Reclamation's director for this region calls, with an admiration of his own, "the remarkable storage vessel at Echo Park".

As you turn then in imagination from Harpers Corner and make the long walk back to your parking place, and the long wild-road drive back to the transcontinental highway (U. S. 40), you realize that you are within the Dinosaur National Monument—part of America's national park system, a system of a few superlative parts of America dedicated for preservation while all the rest is free for all man's purposes. You begin to feel the profanity of this dam proposal, the threat it poses to all such areas you hold sacred, the challenge that it makes to the very idea of holding sacred any part of the natural earth.

Driving through the plateau land within the national park area that surrounds these canyon chasms, and sensing the violence that would be done to all this wilderness by the very construction itself—\$200 million of sand and gravel and concrete, roads and trucks, men and materials, steel, and the noise of drills and dynamite, man's mighty power in bulldozer and all his great tools—you begin to realize that you are in the midst of a great debate over the very idea of preserving natural parks.

Will you dam the scenic wild canyons of the national park system? That is the question.

As American Forests said in its timely January 1954 editorial, "It is high time the American public called a halt to encroachment of

our great system of parks." And you recognize the Echo Park Dam proposal as the outstanding presently threatened encroachment.

The proponents of the dam tell you that it was understood when the area was established that such a dam could be built, but you look at the proclamation establishing the monument and read that "the administration of the monument shall be subject to the reclamation withdrawal of October 17, 1904, for the Brown's Park Reservoir site in connection with the Green River project." You find that the Browns Park site is far up the Green River near the northern edge of the monument, many miles up the river from the now proposed Echo Park site. You understand why the possible construction of this Browns Park Dam could have been allowed, and you understand, too, that this proclamation can never be distorted into a true justification for constructing the Echo Park and Split Mountain Dams in the heart of the monument, inundating practically all the area's scenic canyons which it was set aside to preserve. You recognize this new proposal as clearly an encroachment on a duly designated national park area.

You hear the proponents of these dams in the monument claim that the reservoirs will themselves provide recreation and attract many people, but you know that such recreation will anyhow be afforded by other reservoirs outside the monument, while the wild-canyon experiences of the unspoiled wilderness cannot be duplicated.

For, finally (I trust), you realize that these national park sites are not needed for reservoirs. The reservoirs can be built elsewhere, with all their advantages to the people of the Colorado River Basin and indeed to the people of the Nation, which we all appreciate. You hear an alternative program outlined, see its feasibility, hear its various features debated.

You see the proponents of the Dinosaur dams, nevertheless, built pretexts into the semblance of argument, and you realize after all that not necessity but supposed advantage tempts these would-be dam builders into the national park system.

The challenge is a challenge to the concept and integrity of the national park system.

I do wish, Mr. Chairman, to be understood as being interested in the welfare and prosperity of this great upper Colorado region of our country and its people. Just as I have come to value the privilege of visiting this region and breathing a little deeper in its outdoors, so also I have valued the privilege of knowing the people who live there. I value highly their hospitality and friendship. I share their aspirations, and wish accordingly to be understood as approaching this controversy with hope and confidence that it will be so resolved as not only to preserve the areas which have been set aside for preservation but also to provide for the wise development of the region.

I have been particularly sensitive to the claim that we who oppose the Echo Park and Split Mountain Dam proposals are in danger of breaking faith with the people of this region.

I have read with deep interest David H. Madsen's March 27, 1950, affidavit regarding the June 11, 1936, and June 13, 1936, public meetings at Vernal, Utah, and Craig, Colo., at which, he testified, he then authoritatively stated, as a representative of the National Park Service, "that in the event it became necessary to construct a project or projects for power or irrigation in order to develop that part of the States of

Colorado and Utah, that the establishment of the monument would not interfere with such development."

I have read also with deep interest the March 27, 1950, affidavits by J. A. Cheney, Joseph Haslem, Leo Calder, H. E. Seeley, and B. H. Stringham regarding one or both of these meetings, at which they said, each with the same words, that "the National Park Service representative assured the residents of these areas that if the Dinosaur National Monument were enlarged, that the National Park Service would not prevent or stand in the way of future reclamation projects on the Green River or the Yampa River within the boundaries of the Dinosaur National Monument, for irrigation or power purposes."

It has been pointed out by others that such assurance could not have been given responsibly and authoritatively, because the letter of instructions from the Secretary of the Interior of June 8, 1936, expressly prohibited the National Park Service from making commitments on the subject of water development at the hearings. Nevertheless, I have still been disposed, personally, to have a regard for these discussions testified to by Mr. Madsen and these other residents of Utah, to try to look at this situation from the viewpoint of these people's own understanding, and to feel a moral responsibility to abide by the outcome of such agreements as were understood.

Yet I am without any belief whatever that they justify approval of the Echo Park or Split Mountain Dams.

The outcome of the discussions and considerations of which these meetings and so-called agreements were a part was the proclamation establishing the Dinosaur National Monument as we know it today.

We have in this country what I believe is an excellent democratic process of discussing extensively (and intensively) all aspects of any proposed public action. Then the various points of view are resolved in some definite action. We adopt a constitution. We enact a law. We have a Presidential proclamation. Then we pass on to future discussions of other problems with our past discussions and agreements made formal and finally resolved in writing—for our clear understanding not only at the time but in the future.

Such was the Presidential proclamation of 1938. Some 2 years after the 1936 public hearings and following various governmental considerations, this proclamation enlarged the monument and at the same time included and defined the public understanding regarding reservoir projects, as follows:

This reservation * * * shall not affect the operation of the Federal Power Act of June 10, 1920 (41 Stat. 1063), as amended, and the administration of the monument shall be subject to the reclamation withdrawal of October 17, 1904, for the Brown's Park Reservoir site in connection with the Green River project.

There is no evidence of any dissatisfaction with this statement—no evidence at all that provision for the Brown's Park Reservoir site was not an adequate recognition of such assurances as were understood. The proclamation's reservation is specific. It applies to a site and an area many miles up the river from the sites now being argued. And Congress by appropriating for and providing for the administration of the monument has in effect, repeatedly endorsed this proclamation. I can only conclude that we have in this respect no obligation to the people of this region other than our obligation to respect this proclamation's provision that the administration of the area is subject to a prior withdrawal for the Brown's Park Reservoir site.

As Secretary of the Interior Douglas McKay himself said, in my hearing, tapping the edge of his desk with his index finger, "Just because I give somebody permission to do something at this desk, it doesn't mean that he can do it anywhere in the room." Wrong as Secretary McKay is, in my opinion, in supporting the Echo Park Dam proposal, he does recognize that it is not authorized in the proclamation that establishes the national monument.

We are thus in no sense breaking faith with the people of this region in urging the preservation of this area. In emphasizing this I should like also, in as friendly a fashion as possible, to remind the people of Utah and Colorado that all of us from all parts of the country share with them the public ownership of this unit in our national park system, and I would appeal to them to recognize that they have a responsibility to all of us for its protection. I recognize that our national welfare depends on the welfare of this region, and I feel that my own personal welfare is related to the personal welfare of my fellow citizens in Utah and Colorado. I am interested in the national importance of the upper Colorado River program for the benefit of this region and its people. At the same time I would urge all of them to keep faith with all of us throughout the Nation, and with those of future generations, by cherishing these scenic wild canyons and helping to preserve them unimpaired.

It is important, I believe, in discussing these so-called agreements and our various obligations, regional and national, to recognize that the Dinosaur National Monument was created out of lands that already belonged to the Nation, public domain that belonged to all of us. In some parts of our country private lands have been purchased for, and State lands have been turned over to, the Federal Government for the creation of national parks. Those who have lived near these areas have given such parks to the Nation. Here, the Nation, already in ownership of this public domain, merely dedicated it for a special use of all the Nation—including the people of Utah and Colorado who indeed are in a preferred location—as one of the superbly beautiful parts of the land to become a part of the national park system.

The purpose of the enlarged Dinosaur National Monument, it is clear, is to preserve the marvelous wild canyons of the Green and Yampa Rivers. The shape of the monument, as readily seen on the map, shows that this is the purpose, its size being that which is necessary to preserve and protect properly these canyons. Only so much as was needed for this purpose was thus reserved out of our own public domain and set aside from the normal commodity uses that are made by local residents of other parts of the public domain or of the private lands which they own or rent.

During the public debate that followed the Bureau of Reclamation's proposal of this Echo Park Dam some 4 years ago, it has been clearly shown, I believe, not only that (1) the scenic wild canyons of the Dinosaur National Monument are superb and unique, a wilderness resource irreplaceable, invaluable, and increasingly popular; but also (2) that it is not necessary to destroy this national monument in order to realize the purposes of the upper Colorado River project. Others have spoken, and will yet speak, in greater detail and with better understanding of alternative programs. All of us conserva-

tionists have shown real interest in them. Far from wishing to enforce any denial of water storage or power potential on the people of the region, we have extended ourselves to demonstrate that there can be a program that will serve all public purposes, including national park preservation. Neither evaporation loss, which was once officially described as the fundamental issue, nor any other supposed sacrifice, I am sincerely convinced, will ever become any severe penalty on the people of Utah and Colorado for the preservation of the Dinosaur National Monument. I am confident that in no way will they eventually regret joining with all of us in its preservation.

In *The Living Wilderness*, the quarterly magazine which I edit for The Wilderness Society, we have devoted earnest attention during the past 4 years to the presentation of information about the Dinosaur National Monument and its preservation within a successful program for the upper Colorado River storage project. In addition to numerous news items with maps and photographs we have published a number of articles of feature length. In our autumn 1950 magazine we published General Grant's definitive discussion with the title "The Dinosaur Dam Sites Are Not Needed." In this same magazine we published Margaret E. Murie's appreciation of the national monument entitled "A Matter of Choice," which concluded: "Water, yes, for those dry States. By all means. But, what if it can be had in some other way than by damming up the beautiful canyons of the Green and the Yampa in this particular convenient spot." Mrs. Murie quoted Robert Browning:

Oh, if we draw a circle premature
 Heedless of far gain,
 Greedy for quick returns of profit, sure
 Bad is our bargain.

In the autumn 1950 magazine we also included Mildred E. Baker's *Lifelong Inspiration*, recalling her 1940 trip on the Green River. These autumn 1950 articles were combined later in a special reprint entitled "The Dinosaur Dam Case," a copy of which is herewith submitted for the committee's files and additional copies of which will be gladly supplied. There similarly is submitted a reprint of Philip Hyde's article "Nature's Climax at Dinosaur" which we were privileged to publish with a selection of Mr. Hyde's brilliant photographs and a special map by W. Frederick Freund in *The Living Wilderness* for autumn 1952.

We have sought to emphasize, not only that the upper Colorado River program can be realized along with the preservation of the Dinosaur National Monument, but also that our only way of preserving any such areas throughout our land is by dedicating them and not allowing any destruction. Our whole American policy for preserving some of our wilderness is, in fact, based on two understandings that are here involved. On the one hand is the understanding that our land and water resources are great enough and varied enough to make possible the preservation of a system of wilderness areas without sacrificing the commodity production and other uses that make it necessary to develop most of our areas. On the other hand, our wilderness preservation program is based on the understanding that our civilization is such that no lands will persist unexploited except those that are deliberately set aside and faithfully protected. For this policy to prevail we must be faithful in respecting our dedica-

tions, for otherwise the dedicated areas will inevitably disappear one by one as it seems profitable to exploit them. We cannot merely set aside an area until we get to it with some kind of exploitation project without defrauding both our own and future generations.

To permit the would-be exploiters of Dinosaur National Monument to build the Echo Park and Split Mountain Dams would certainly jeopardize this public policy of national-park preservation. Rather than place this great and brilliant policy of the American people in such jeopardy let us instead strengthen it by reasserting our adherence to it and our determination that it must be respected. If we turn back now this threatened invasion, by reaffirming the sanctity of the areas which the Nation has dedicated for preservation, we can be sure that the whole national system of parks, monuments, wildlife, refuges, wilderness, wild, primitive, and roadless areas will, indeed, be safeguarded more surely than ever.

We cannot avoid setting precedents. We can only do our best to see that the precedents which we do set are sound.

STATEMENT BY FRED M. PACKARD, EXECUTIVE SECRETARY, NATIONAL PARKS ASSOCIATION, ON S. 1555, RELATING TO THE UPPER COLORADO RIVER STORAGE PROJECT

The National Parks Association is a citizens' organization with membership in every State, dedicated to the continued welfare of the national-park system. Its activities are conducted entirely in the public interest. Its members derive no other benefit than the conviction that they are promoting the welfare of their country.

Our association has no desire to impede orderly development of the water resources of the West. We believe the Western States should have full use of the water available to them, and that decisions regarding where and how it should be used is fundamentally a matter of their concern. When such proposals affect the national welfare, the base of interest of course broadens to include the people of every State, and their views become of equal significance.

The national conservation organizations approve development of a sound plan to produce necessary water and power benefits from the natural resources of the upper basin States. Such a plan should be justified by demonstrated need for the results anticipated; it should produce them by whatever method is the most efficient and economical; and it should cause as little damage to other values as possible. It is the responsibility of the engineering authorities to develop such plans and to investigate and evaluate all possible methods of achieving the desired results. They must demonstrate concretely that the proposal they recommend is the wisest way to do the job.

The Bureau of Reclamation has submitted its upper Colorado River storage project to the Congress. Is this, as it stands, the best solution to the problem? It contains at least one serious defect of national significance, the proposal to utilize a reserved national park system area for dam sites. Our organizations have expressed the view unitedly that this invasion of the national-park system is contrary to the national welfare. As we have studied the proposal, we have noted that justification for doing so is based on faulty calculations. It is becoming increasingly evident that it is not necessary

to achieve the desired results. We believe Echo Park Dam should be deleted from the project, and that the overall proposal should not be approved as long as Echo Park Dam is a part of it.

Our national parks and monuments have been reserved to safeguard forever the unique and outstanding natural and historic assets of the country, to preserve and exhibit the wonders and beauties of nature—not the works of man. The wisest and most productive use that can be made of them is for the physical, mental, moral, and inspirational well-being of the people which benefits are possible only if their existing natural character is preserved without impairment, unaltered by human interference. They comprise less than 1 percent of our lands. Amid the growing tensions of modern civilization, their contributions to the people become ever more urgent and important. We concur with Secretary of the Interior Krug, who said:

Large power and flood-control projects should not be recommended for construction in national parks unless the need for such projects is so pressing that the economic stability of our country, or its existence, would be endangered without them.

Proponents of the project have asserted Echo Park Dam is essential; but there seems a dearth of concrete evidence to support that contention. Under Secretary Tudor told the House subcommittee that the fundamental reason for recommending Echo Park Dam was that the differential in water evaporation loss between this and alternative proposals was so excessive, amounting to 100,000 to 200,000 acre-feet, as to require it to be built. After another witness pointed out errors in the calculations, the Department rechecked its statistics, and reported that the loss would be only 25,000 acre-feet. Therefore, the basic justification supporting recommendation of this dam proved to have little, if any, validity.

It is significant also that the Secretaries of the Interior under whose administration the storage project was planned stated publicly and clearly that their careful studies showed Echo Park Dam is not necessary and should not be built. Secretary Chapman's only recommendation to the President on this matter, dated December 4, 1952, so advised.

There is no question but that construction of Echo Park Dam would alter existing conditions in Dinosaur National Monument. There are variant opinions as to how drastic the change would be. Those favoring the dam minimize the effect, some stating it would actually improve the beauty of the monument. Those opposing the dam believe the great canyons would be so changed as to ruin the area for the purpose for which they were reserved. The magnificent canyons of the Green and Yampa Rivers are of such quality as to warrant their continued protection as they are. They possess every qualification for inclusion in the national-park system. They offer extraordinary opportunities for public enjoyment and refreshment of the most significant kind; and we believe these qualities represent the wisest use of the area. An artificial reservoir, duplicated in character by all the other elements of the overall project, can contribute only superficially to public recreation and provide little sufficiently unusual to attract serious interest in it. To exchange the superlative values that now exist there for inferior manmade conditions is not, of itself, a sound justification for the dam.

The question is not how deep the water in the reservoir would be, nor how much of Steamboat Rock would be flooded: it is whether this national park system area should be subjected to an exploitive use that would change its character. How permanent is the protection given our national-park system.

It has been asserted by proponents of Echo Park Dam that its location within the monument would not constitute a precedent affecting other national-park system areas. Since 1916, when the National Park Service was established, no major engineering structure has been authorized or built within any national park or monument. Nonetheless, a number of such projects have been and are actively proposed. Among the national parks contemplated as dam sites as adversely affected by proposed dams are Glacier, Grand Canyon, Yellowstone, Kings Canyon, and Mammoth Cave National Parks. These and other proposals are discussed on pages 805 through 808 of the House hearings on H. R. 4449. If Echo Park Dam is approved, a precedent will have been established that endangers the entire national-park system.

Considerable confusion has arisen about whether the National Park Service made commitments to the people of Utah regarding future water-development projects in the enlarged monument. Mr. Stringham has presented documents that indicate the question was discussed at the hearings in Utah in 1936, including the affidavit of Mr. David H. Madsen, who conducted the hearings and stated, in 1950, that he was authorized to state as a representative of the National Park Service that enlargement of the monument would not interfere with a project or projects for power or irrigation to develop that part of Colorado and Utah.

Was Mr. Madsen empowered to make agreements on this subject? On June 8, 1936, Secretary Ickes addressed a memorandum to the Director of the National Park Service containing his instructions governing the hearings. He discussed the natural values of the proposed enlargement, and directed that grazing permits be continued. He further stated that the question of future development of potential water and power resources is a matter to be determined by Congress; in other words, it was not to be settled at those hearings. Mr. Madsen, therefore, was not authorized to make commitments for the National Park Service on this subject. If Mr. Madsen did discuss the possibility of any reclamation developments in the monument, he evidently did not so report to the Director. His official report, which I have read, is entirely about one subject, grazing. It does not mention water development, even by implication.

Because of an established withdrawal of 1904, covering the Browns Park site which extends 4 miles into the northern boundary of the monument, the Park Service did agree to a reservation in the proclamation of 1938 for that project, as part of the Green River Project. This was an old proposal of the Utah Power & Light Co., and the Bureau of Reclamation advised the Park Service the Browns Park site was not suitable. The Park Service understood this project would not be built; otherwise the lands involved probably would not have been included in the enlargement.

The proclamation refers specifically to the Browns Park project, and states that the Federal Power Act, as amended, shall apply to the enlargement. Mr. Stringham referred to the amendment of 1921,

but failed to consider that of 1935. The purpose of these amendments was to remove the power of the Federal Power Commissioner to issue licenses for power dams within any existing or future national parks or monuments. Two solicitors of the Department of the Interior have officially and publicly stated that these amendments also forbid licensing of reclamation or irrigation projects in such locations by the Secretary of the Interior. In the interest of brevity, I shall not undertake elaboration of the provisions of this act, but submit for the record a thorough legal study of the matter by the noted attorney, Mr. Manly Fleischmann, and the opinions of the solicitors referred to.

Thus, the situation in 1938 was that the Browns Park project might be built if feasible, but that only Congress could authorize any other projects within the monument. It is now asked to do so by proponents of Echo Park Dam. Subsequent to 1936, private development of the Green River project was abandoned, and attention was concentrated on planning the Federal Upper Colorado River storage project. In 1943, the Bureau of Reclamation, without consulting the National Park Service, published notice of a new reclamation withdrawal covering most of Dinosaur National Monument. Director Drury protested this action, pointing out that the National Park Service was awaiting the results of cooperative studies then in progress to determine its position on the subject; and he asked that the 1943 withdrawal be amended to exclude from it any lands within the monument. (See pp. 735 and 736 of the House hearings.) These studies were completed in 1946. The National Park Service devoted a full chapter to a strong defense of Dinosaur National Monument from the ruinous effects that would result from this dam to values the Park Service was charged to protect. It expressed its opposition to the project officially.

On June 23, 1952, the present Director, Mr. Wirth, expressed his understanding of the situation in a letter to Mr. Phillip Hyde. The following is quoted from it:

Enough information is at hand to convince me that Mr. Madsen's recollection of our policy is not correct. The controlling document, of course, was the Secretary's policy statement of June 8, 1936, which governed Mr. Madsen's presentation of our case. * * * To sum up our position with reference to Mr. Madsen's and Mr. Untermann's recollections, these gentlemen either did not understand the Service point of view, or, in the intervening years, their recollection of the policies stated at that time has not been accurate.

This letter, with Secretary Ickes' memorandum, is submitted for the record.

It must be emphasized that this controversy is not a question of securing water benefits or preserving a park area. It is a matter of determining how best to achieve both results. The water flowing through the monument unimpeded is not wasted; it is available for use above and below that locality. Proponents of this storage project appear to believe that the present proposal must be adopted in its entirety, or all hope of gaining the benefits must be relinquished. That is not true.

Recognizing the value of constructive criticism, we have not simply opposed Echo Park Dam. Studying the Bureau of Reclamation's reports, we pointed out that there are ways to revise the sequence of construction of other dams involved to meet the difficulty. Or, it appears possible to adjust certain engineering features of some of the other dams to secure the desired results. Still another possibility

has been suggested by Mr. Herbert Hoover, who points out that other fuel resources exist in abundance in the region adequate to produce all the desired power, and that the amount of water storage proposed is not necessary to meet the requirements of the Colorado River compact. It is quite likely that other revisions might be beneficial.

We do not advocate one or the other of these particular alternative approaches as the proper solution to the problem. We do insist that all of them should be thoroughly investigated before final decision is made to authorize a project of such magnitude and impact. The Hoover Commission is now making an exhaustive inquiry into many aspects of the water development program, including this storage project. It would seem sensible to await its conclusions before authorizing a new multi-billion-dollar project to be initiated.

While our direct concern here is the protection of the national park system, we are keenly interested in the wise development of the water resources of the Nation. They must be utilized for the welfare of our people, and we hope they will be used wisely. Dedication of every acre of land and water to the best possible purpose is the foundation of the conservation program, whether that use be economic, social, or cultural. It is encouraging that the Members of Congress, for many decades, have consistently insured that this principle shall be followed, and have made their decisions in such matters on that basis. In such hands, we are confident this problem, like others that have preceded it, will be resolved in a fashion that will produce the greatest national good.

DEPARTMENT OF THE INTERIOR,
NATIONAL PARK SERVICE,
Washington 25, D. C., June 23, 1952.

Mr. PHILIP HYDE,
Plumas County, Greenville, Calif.

DEAR MR. HYDE: I regret that we have been unable to reply earlier to your inquiry of April 15, 1952, concerning commitments alleged to have been made by representatives of this Service concerning our attitude toward the development of hydroelectric power potentialities in Dinosaur National Monument, when that area was enlarged in 1933, General Grant, Mr. Fred Packard, and Mr. Zahniser have been in touch with us on this subject also in connection with your inquiry to them. Your letter and enclosure to General Grant, which he acknowledged on April 30 and forwarded to us, are enclosed.

In the meantime, we have been making further search of the records and documentary evidence that would confirm or refute the statements made in the 1950 affidavit of Mr. Madsen and, more recently, by Mr. Untermann, with respect to alleged promises made by this Service concerning future power developments in the monument. The records are scattered and it is difficult to reconstruct the history of the case in its entirety. We have tried unsuccessfully to locate transcripts of the hearings held at Vernal, Utah, and Craig, Colo., in June 1936. Search for the transcripts, however, is still being made by the Bureau of Land Management. Even though we do not have available the transcript of these two hearings, we do have the reports which Mr. Madsen submitted to us immediately following the hearings, and we have the policy statement signed by Secretary Ickes governing our position at the hearings. In Mr. Madsen's reports, he did not mention any discussion of the question of reservoirs in the proposed monument addition. According to his reports, all of the discussion centered around the subject of grazing. If additional information is found, I shall be glad to send it to you.

Enough information, however, is at hand to convince me that Mr. Madsen's recollection of our policy is not correct. The controlling document, of course, was the Secretary's policy statement of June 8, 1936, which governed Mr. Madsen's presentation of our case and which he read at the hearings. A copy of that policy statement is enclosed for your information. You will note that the last paragraph states:

"The future development of potential mineral, water, and power resources, if and when it should become economically feasible, would be determined by the Congress."

Our records indicate that we had conflicting and inconclusive evidence from a number of sources as to whether it would ever become necessary to develop the potential hydroelectric power resources of the proposed monument addition. The Service, acting on what it considered to be the best available advice, decided to recommend issuance of the proclamation, subject to the Browns Park reclamation withdrawal, and to face the problem of other reservoir proposals affecting the monument in the future, in the light of the facts and circumstances that would then apply and would serve as a basis for judgment. This most certainly was not a commitment as to what our position would be before the controlling facts could be known.

When the proclamation to extend the monument to include the Yampa and Green River Canyons was drafted, it was made subject to the Browns Park reclamation withdrawal, which extended 4 miles into the northernmost portion of the monument, where a dam could be constructed in the upper end of Lodore Canyon if the project were found to be feasible under the terms of the reclamation law and if the necessary funds were appropriated by Congress. If the dam were built at the Browns Park site, it would, of course, do very much less damage to the national monument than if it were built at the Echo Park site near the center of the monument, as the Bureau of Reclamation proposed in lieu of the Browns Park site about 2 years after the monument was enlarged. The proclamation also contained a provision "that this reservation shall not affect the operation of the Federal Water Power Act of June 10, 1920 (41 Stat. 1063), as amended," which was insisted upon by the Federal Power Commission. This provision, of course, had no legal force or effect, since Congress, by the act of August 26, 1935 (49 Stat. 838, 847), had specifically exempted national parks and monuments from the Federal Water Power Act. We assume that the Federal Power Commission wished to document its position regarding power potentialities in the monument.

From 1941 to 1945, under interbureau agreements with the Bureau of Reclamation, we made studies of proposed reservoir sites in the Colorado River Basin, including the proposed Split Mountain and Echo Park Reservoir sites in Dinosaur National Monument. In what we considered to be a fairminded approach, we attempted, with the assistance of Frederick Law Olmsted, well-known authority and consultant to our Service, to appraise the probable effects of these two proposed reservoirs on the national monument and to formulate plans for the best development and public use of the monument in the event either that the Congress should authorize the projects or that it should sustain the national monument. We did not take an official position with reference to these proposed reservoirs in the monument until after these studies had been made and we were in possession of more information from the Bureau of Reclamation concerning its plans for the development of the water resources in the Colorado River Basin generally. At that time the problem was carefully considered. We concluded that, while we were committed to the construction of the Browns Park Reservoir, even though it would constitute an encroachment in violation of general park policy, the construction of the Echo Park Reservoir, with its considerable fluctuation of water level and flooding of the valley bottom lands throughout most of the monument, would be so damaging that we would have to recommend its disapproval. The facts available to us indicated not only that the Echo Park project would do much the most harm to the monument, but that there are other reservoir potentialities in the upper Colorado River Basin which might make it unnecessary to construct the Echo Park Dam, if the other potentialities were developed first.

To sum up our position with reference to Mr. Madsen's and Mr. Untermann's recollections, these gentlemen apparently either did not understand the Service point of view or, in the intervening years, their recollection of the policies stated at that time has not been accurate. At the time the monument was enlarged, evidence concerning the future needs for water storage therein was inconclusive, even as it is today, and the policy statement issued by Secretary Ickes so recognized.

I do not feel that our actions in this case have broken faith with anybody. On the contrary, I feel that the Service has maintained a fair and openminded approach toward the problem throughout; that we deferred the formulation of recommendations concerning these projects until sufficient evidence was available on which to base our position; that when that time was reached we made

our recommendations in a frank and forthright manner in the hope that a solution could be found that would meet the essential water and power needs of the upper Colorado River Basin and at the same time would preserve the essential values of Dinosaur National Monument.

Sincerely yours,

CONRAD L. WIRTH, *Director.*

THE SECRETARY OF THE INTERIOR,
Washington, June 8, 1936.

MEMORANDUM FOR DIRECTOR CAMMERER.

I am personally interested in the establishment of the Escalante, Green River, and Kolob Canyons National Monuments in the public domain.

Viewing the matter from the national point of view and with a future perspective, I believe the establishment of these national monuments is desirable for two equally important reasons:

First: The areas under consideration contain superlative scenery, valuable archeological relics, outstanding examples of erosion, and other exhibits of earth forces, in addition to a vast assemblage of native plant and animal life; all of which have untold recreational potentialities and educational value. If we are to utilize these areas properly, they must be conserved and rendered available to the people of the Nation. That is the purpose of national monuments.

Second: National-monument status has been proposed as the most suitable and profitable use to which the areas could be put. These lands are not known to be high in range productivity, mineral content, or in other known commercial resources. The inhospitality of the areas is evidenced by their lack of agricultural or industrial development, although they have been inhabited for several generations. Since the agricultural and industrial development of the areas has not been profitable, it would seem reasonable to conserve and develop the other resources; namely, the recreational, archeological, and scientific resources which have been ignored heretofore and will be destroyed if not properly protected. The tourist business is a good business but people will not come to see overgrazed stock ranges.

Beginning on June 9, and continuing on various days subsequent thereto, the Division of Grazing and the National Park Service, in cooperation with representatives of various interests in western Colorado and in Utah, will consider the objectives and problems of the Green River, Escalante, and Kolob Canyons National Monument projects. I am hopeful that these deliberations will provide a fair and equitable adjustment of all interests concerned so that we may proceed with the establishment of the monuments. To correct any misconceptions which might arise I shall state the following general policies:

The grazing of livestock shall be permitted within these monument areas, under the administration of the National Park Service, as it has been in various other national parks and monuments, subject to the condition of the range and in sympathy with the economic requirements of the communities concerned. Such grazing permits, issued by the National Park Service and in cooperation with the Division of Grazing, shall not be construed as granting an interest in the national-monument lands and shall not be renewable after the removal or death of the original holders. By this method, the transition from the present limited use of these areas for grazing to their use and development as national monuments will be a gradual process, with due regard and consideration of existing economic requirements.

The construction of roads, trails, and accommodations to provide for the proper recreational use and protection of the areas is desirable.

The future development of potential mineral, water, and power resources, if and when it should become economically feasible, would be determined by the Congress.

HAROLD ICKES, *Secretary.*

MEMORANDUM RE LEGAL STATUS OF NATIONAL PARKS AND MONUMENTS WITH REFERENCE TO THEIR USE IN FEDERAL IRRIGATION OR POWER PROJECTS

1. *Statement of the problem.*—The general question to be considered is the power of the executive and legislative branches of the Federal Government over national parks and monuments. More specifically, the memorandum will discuss the authority of the President and other executive officials of the Govern-

ment to use any part of a national monument for the construction of such a project without prior congressional approval. While the inquiry has been directed specifically to the status of the Dinosaur National Monument and the proposed upper Colorado River storage project, the governing legal principles will be found to be generally applicable to other national parks and monuments.

2. *Background of the problem.*—The Dinosaur National Monument is located in eastern Utah and northwestern Colorado. It was established on October 4, 1915, by proclamation of the then President, Woodrow Wilson (39 Stat. 1752). The monument was originally 80 acres in size and was enlarged to 209,744 acres on July 14, 1938, by proclamation of Franklin D. Roosevelt (proclamation 2290, 53 Stat. 2454).

Both of these proclamations were issued pursuant to section 431 of title 16, United States Code, enacted on June 8, 1906, which provides as follows:

"The President of the United States is authorized, in his discretion, to declare by public proclamation, historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and may reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected. When such objects are situated upon a tract covered by a bona fide unperfected claim or held in private ownership, the tract, or so much thereof as may be necessary for the proper care and management of the object, may be relinquished to the Government, and the Secretary of the Interior is hereby authorized to accept the relinquishment of such tracts in behalf of the Government of the United States."

It should be particularly noted that the 1938 proclamation of President Roosevelt enlarging the monument stated that "* * * the administration of the monument shall be subject to the reclamation withdrawal of October 17, 1904, for the Brown's Park Reservoir site in connection with the Green River project." As a result of this specific reservation of the Brown's Park Reservoir site, it is clear that that site could be used for an irrigation project in accordance with the original reclamation withdrawal of October 17, 1904, but I am informed that such use would not seriously interfere with the preservation of Dinosaur. I am attaching as appendix A copy of the original withdrawal which includes a description of the Brown's Park Reservoir site.

The Dinosaur National Monument is administered by the National Park Service, which is in the Department of the Interior, pursuant to sections 1 and 2 of title 16, United States Code.

3. *General authority of Congress and the President with respect to the public domain.*—The power of Congress over the public domain (used here in its most general sense to include all lands owned by the Federal Government) is derived from article IV, section 3, clause 2 of the Constitution of the United States. The power is exclusive, plenary, and subject to no limitations. On the other hand, the President and the other executive officers of the Government have no such constitutional or inherent authority. They can exercise only such powers as are delegated to them by congressional action.

These principles are settled by a long line of judicial holdings, of which only a few need to be cited (*United States v. City and County of San Francisco*, 310 U. S. 16, 60 S. Ct. 749 (1940); *Northern Pac. R. Co. v. Smith*, 171 U. S. 260, 18 S. Ct. 794 (1898); *Griffin v. United States* (C. C. A., 8th Circuit, 1948), 168 F. 2d, 457; *United States v. State of California*, 332 U. S. 19, 67 S. Ct. 1658 (1947)).

Furthermore, these rules have been specifically applied to the proposed abolition of a national monument by Presidential proclamation, which is almost the exact question here considered. This opinion (39 Op. Atty. Gen. 185) holds that the President has no authority to abolish a national monument, even though the monument was originally established by Presidential proclamation. Principal reliance is placed upon an earlier opinion by Attorney General Bates (10 Op. Atty. Gen. 359) where it was held that a reservation made by the President under discretion vested in him by congressional statute is in effect a reservation by Congress which the President cannot thereafter terminate since "the grant of power to execute a trust, even discretionally, by no means implies the further power to undo it when it has been completed." The Attorney General cites as authority for this proposition the case of *Wilcox v. Jackson* (18 Pet. 498), which holds that lands reserved for military purposes by Presidential proclamation issued pursuant to statute cannot be returned to the public domain by Presidential proclamation.

The authorities just cited are clear and persuasive, and the principles enunciated are not subject to any serious question. Accordingly, it is concluded that Congress has plenary and unlimited authority over national monuments and could authorize any use of all or any part of Dinosaur Monument. It is further concluded that in the absence of such congressional authorization neither the President, nor any subordinate official, has power to license any use of the monument which would in any way impair its primary function as a public monument.

This brings me to consider the question whether such authorization has in fact been granted by either one of two Federal statutes.

4. *Federal Power Act*.—The first Federal Power Act, known as the Federal Waterpower Act was enacted in June 1920 (41 Stat. 1063), and created the Federal Power Commission to deal with Federal waterpower problems. This act, the present version of which is incorporated in sections 791 to 823 of title 16, United States Code, gave the Federal Power Commission authority to issue licenses " * * * for the purpose of constructing, operating, and maintaining dams, water conduits, reservoirs, powerhouses, transmission lines, or other project works necessary or convenient for the development, * * * transmission, and utilization of power across, along, from, or in any of the streams or other bodies of water over which Congress has jurisdiction under its authority to regulate commerce * * *, or upon any part of the *public lands and reservations of the United States* * * *" (16 U. S. C., sec. 797 (e)). [Italic supplied.]

In what is now section 796 of title 16, United States Code, "public lands" was defined as it presently is:

" * * * means such lands and interest in lands owned by the United States as are subject to private appropriation and disposal under public-land laws. It shall not include 'reservations,' as hereinafter defined:"

"Reservations" was defined as follows: "'reservations' means * * * national monuments, national parks, * * *."

Thus, under the original Federal Waterpower Act, the Federal Power Commissioner had the authority to issue a license for the erection of a dam within a national park or national monument under what is now subdivision (e) of section 797 of title 16, United States Code.

On March 3, 1921, a further act was passed which was made part of the said subdivision (e), which read:

"Provided further, that after March 3, 1921, no permit, license, lease, or authorization for dams, conduits, reservoirs, powerhouses, transmission lines, or other works for storage or carriage of water, or for the development, transmission, or utilization of power, within the limits as constituted March 3, 1921, of any national park or national monument shall be granted or made without specific authority of Congress, and so much (of act of 1920) as authorizes licensing such uses of existing national parks and national monuments by the Federal Power Commission is hereby repealed."

The words "as now constituted" and "existing," were amendments to the original bill which were put in upon motion of a Senator and without discussion. The bill passed the House in that form without further amendment, although it was discussed as being limited to existing national parks and national monuments (Congressional Record, vol. 60, p. 4204, 66th Cong., 3d sess.).

It appears from the statutory history that the reason for passage of the 1921 amendment to the Federal Power Act was that the President and the Secretary of the Interior did not approve of the Federal Power Commission having the power to grant licenses for the building of dams within national parks and national monuments. It was thought that this authority should be reserved to Congress alone. As a result, the Secretary of the Interior had been of the opinion that the President should veto the 1920 bill and it was permitted to become law only upon the promise of one of the Senators that at the next session of Congress the power over dams within national parks and monuments would be taken away from the Commission and given to Congress (Congressional Record, vol. 60, pp. 2001, 3789, 4204, 66th Cong., 2d sess.).

By act of August 26, 1935 (49 Stat. 838), the Federal Waterpower Act was further amended to read as it does today, and its title was changed to the "Federal Power Act." What is now section 796 of title 16, United States Code, was amended to change the definition of "reservations" so as to exclude from that definition national parks and national monuments. Thus subdivision (2) of section 796 now reads as follows:

" 'Reservations' means national forests, tribal lands embraced within Indian reservations, military reservations, and other lands and interests in lands

owned by the United States, and withdrawn, reserved or withheld from private appropriation and disposal under the public-land laws; also lands and interests in lands acquired and held for any public purposes; but shall not include national monuments or national parks;"

The above amendment was offered as a committee amendment and was agreed to without discussion (Congressional Record, vol. 79, p. 10569, 74th Cong., 1st sess.). The conference report, drawn by the conferees on the disagreeing vote of the two Houses, gives this explanation in Congressional Record, volume 79, page 14621 (74th Cong., 1st sess.):

"The Senate bill included national monuments and national parks in the definition of 'reservations' in section 201 amending section 3 of the Federal Waterpower Act, but the House amendment excluded national monuments and national parks in conformity with the act of 1921. * * *"

The act of 1935 also amended what is now subdivision (e) of section 797 by striking out the amendment added to subdivision (e) by the act of March 3, 1921 (49 Stat. 840).

However, section 212 of the 1935 act, 49 Stat. 847, provides as follows:

"Sections 1 to 29, inclusive, of Federal Water Power Act, as amended, shall constitute part I of that act (incorporated in secs. 791-823 of 16 U. S. Code), 25 (sec. 819 of 16 U. S. Code, which related to offenses and punishment) and 30 (which designated the act as the Federal Water Power Act, and which constituted sec. 791 of 16 U. S. Code) of such act, as amended, are repealed; provided that nothing in that act, as amended, shall be construed to repeal or amend the provisions of the amendment to the Federal Water Power Act approved March 3, 1921 (41 Stat. 1353), or the provisions of any other act relating to national parks and national monuments."

In discussing the intent behind section 212 of the 1935 act, Representative Crosser, of Ohio, had this to say:

"The purpose of this amendment is to clarify the language of the bill, and this is the law now—the national parks organization wants to make sure that the bill does not infringe upon their preserve, so to speak. We are offering this at their request. This is not anything at all technical. The national parks organization thinks it would be helpful to have a provision in the bill distinguishing between the national parks and the Federal Power Commission." (Congressional Record, vol. 79, p. 10575 (74th Cong., 1st sess.).)

While the present confused language of the statute defies completely logical analysis, the intent of Congress seems abundantly clear from the pattern of congressional statements and action since 1920.

Although, by the original Federal Water Power Act of 1920, the Federal Power Commissioner was given the authority to issue licenses to erect dams within national parks and national monuments, this power was taken away by the act of 1921, at least as to the then existing national monuments, and reserved to Congress. Since the 1921 amendment was expressly retained as the law in the amendment of 1935, and since the Dinosaur National Monument was established in 1915, it would seem that there is no question at all that no power dam can be built on the original 80 acres, as established by the 1915 Presidential proclamation, without a specific statute being passed by Congress.

A slightly different question arises as to whether the statutory prohibition applies to the acreage added to that monument by proclamation of July 14, 1938, expanding the monument to 209,744 acres. In view of the fact that the words "national monument" and "national parks" were excluded from the definition of the word "reservations" by the act of 1935, and in view of the discussion in the House of Representatives regarding the 1921 amendment, I conclude that the power of the Federal Power Commissioner over the issuance of licenses to construct power dams within national parks and national monuments has been permanently taken away, including parks and monuments created since 1921.

The Federal Power Act deals primarily with the licensing of power-producing projects as distinguished from reclamation and irrigation projects, which will be later discussed. Nevertheless, I think it clear that the language of the 1921 amendment, reenacted in 1935, is sufficiently broad to forbid licensing of reclamation and irrigation projects by the Secretary of the Interior when invasion of a national park or monument is involved. This opinion is reached independently of my analysis of the Reclamation Acts discussed below, and thus adds support to my conclusion that the invasion of national parks and monuments for any purpose other than their proper use as such parks and monuments is illegal unless authorized by a specific act of Congress.

It should be noted that at least two solicitors of the Department of the Interior have officially and publicly stated their agreement with this conclusion. I annex as appendixes B and C two official opinions of the Department on this subject.

5. *Reclamation laws.*—As has been pointed out, the Federal statutes recognize a difference between power projects and reclamation or irrigation projects. The former are authorized and licensed under the Federal Power Act and administered by the Federal Power Commission; the latter are authorized under the Reclamation Act, 43 U. S. Code, secs. 371-609. We have seen, however, that the restrictions of the Federal Power Act with respect to use of national parks and monuments are generally considered to apply to reclamation projects as well. In addition, analysis of the Reclamation Act and related statutes indicates that the authority of the Department of the Interior to initiate reclamation or irrigation projects is limited to the employment of public lands, which for this purpose excludes national parks and monuments.

The heart of the statute is found in sec. 391 of title 43, establishing the "Reclamation Fund":

"All moneys received from the sale and disposal of public lands in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Texas, Washington, and Wyoming * * * shall be, and the same are hereby, reserved, set aside, and appropriated as a special fund in the Treasury to be known as the 'Reclamation Fund,' to be used in the examination and survey for and the construction and maintenance of irrigation works for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands in the said States and Territories and for the payment of all other expenditures provided for in this chapter." (According to a note under sec. 391 in the supplement to title 43 of United States Code, the words "this chapter" at the end of this section should read "sections 372, 373, 381, 383, 391, 392, 411, 416, 419, 421, 431, 432, 434, 439, 461, 491, and 498 of this title.")

The statute is ambiguous as to exactly what lands are encompassed in the words "arid and semiarid lands." However the act seems to contemplate only reclamation of public lands as shown by the following sections.

Section 416 of title 43, United States Code, provides as follows:

"The Secretary of the Interior shall, * * * withdraw from public entry the lands required for any irrigation works contemplated under the provisions of this chapter, and shall restore to public entry any of the lands so withdrawn when, in his judgment, such lands are not required for the purposes of this chapter; and the Secretary of the Interior is hereby authorized, at or immediately prior to the time of beginning the surveys for any contemplated irrigation works, to withdraw from entry, except under the homestead laws, any public lands believed to be susceptible of irrigation from said works. * * *"

Section 421 of title 43, United States Code, provides as follows:

"Where in carrying out the provisions of this chapter it becomes necessary to acquire any rights or property, the Secretary of the Interior is authorized to acquire the same for the United States by purchase or by condemnation under judicial process, * * *"

Section 432 of title 43, United States Code, in talking about entry under the homestead laws generally, says:

"Public lands which it is proposed to irrigate by means of any contemplated works shall be subject to entry only under the provisions of the homestead laws, * * *"

This brings us to an inquiry as to what is meant by "public lands."

Prior to the enactment of the Federal Water Power Act in 1920, the term "public lands" as used in statutes and judicial opinions was universally considered to refer exclusively to lands owned by the United States and held subject to private appropriation and disposal under public laws. The term did not include "reservations," i. e., lands withdrawn by official action from private appropriation and disposal, and dedicated to some specific public purpose.

This conclusion is reinforced by the following definitions taken from 73 Corpus Juris Secundum and from the cases cited below:

"The term 'reservation' as used with relation to the public lands means a withdrawal of a specified portion of the public domain from disposal under the land laws and the appropriation thereof for the time being to some particular use or purpose of the general government." 73 Corpus Juris Secundum, section 72, citing *Walker v. Kingsbury* (173 P. 95; 36 Cal. App. 617).

"A reservation of public lands may be made by Congress or by the treaty-making power, * * * [or by the order of the President under the authority of Congress or] independent of any act of Congress expressly authorizing reservation." 73 Corpus Juris Secundum, section 72, citing *Stockley v. U. S.* (271 F. 632 (C. C. A. La.)), reversed on other grounds, 260 U. S. 532; 43 S. Ct. 186).

"Lands which are reserved are effectually segregated from the public domain and pass beyond control of the Government bureau concerned with settlement of public lands." 73 Corpus Juris Secundum, section 77; *Scott v. Carew* (25 S. Ct. 193; 196 U. S. 100).

"The terms 'public lands' and 'public domain,' which are regarded as synonymous, do not include all the land owned by the United States or the States. Such terms are habitually used in the United States to designate such lands of the United States or of the States as are subject to sale or other disposal under the general laws, and are not held back or reserved for any special governmental or public purpose, and do not include lands to which rights have attached and become vested to full compliance with an applicable land law." *U. S. v. Phillips* (33 F. Supp. 261, vacated on other grounds, 312 U. S. 246; 61 S. Ct. 480); *Borax Consolidated v. City of Los Angeles* (296 U. S. 10, 17; 56 S. Ct. 23, 27).

Any doubt as to the correctness of this view was ended with the enactment in 1920 of the Federal Water Power Act. Section 796 defines "public lands" as: "such lands and interest in lands owned by the United States as are subject to private appropriation and disposal under public laws. It shall not include 'reservations' as hereinafter defined."

The act then proceeds to define "reservations" as including national park and national monuments, along with national forests, tribal lands embraced within Indian reservations, military reservations, and "other lands and interests in lands owned by the United States, and *withdrawn, reserved, or withheld from private appropriation and disposal under the public land laws. Also lands and interests in lands acquired and held for any public purposes.*" [Italic supplied.]

As pointed out above, this definition was changed in 1935 so as to exclude national monuments and national parks from the definition of the word "reservation" for the stated and sole purpose of taking away all control of the Federal Water Power Commissioner over national parks and national monuments, in regard to licensing of dams therein. It is certain from the congressional history that the change in definition was not intended to throw national parks and national monuments back into the category of "public lands"—exactly the contrary was intended.

The land in Dinosaur National Monument is reserved and held for a public purpose by the proclamations of Woodrow Wilson and Franklin D. Roosevelt pursuant to 16 United States Code, section 431, which gives the President power to "reserve" parcels of land for the purpose of establishing national monuments.

In Wilson's proclamation, the following language is found:

"* * * it appears that the public interest would be promoted by reserving these deposits as a national monument together with as much land as may be needed for the protection thereof."

The proclamation then "set aside" certain lands as the Dinosaur National Monument (39 Stat. 1752).

In Roosevelt's proclamation, the following language is found:

"Whereas, it appears that it would be in the public interest to reserve such lands as an addition to said Dinosaur National Monument:

[I proclaim the following described lands] "are hereby *reserved from all forms of appropriation under the public land laws* and added and made a part of the Dinosaur National Monument * * *" (535 Stat. 2454). [Italic supplied.]

From the foregoing, it appears quite clearly that the Secretary of the Interior has no power to utilize land within a national monument such as Dinosaur for reclamation purposes without authority of Congress since land within a national monument is not "public land" but "reserved land."

In regard to the Dinosaur National Monument, it should also be noted that the proclamation of Franklin D. Roosevelt enlarging the original acreage of the monument in 1933 states that the reservations of lands under that proclamation "shall not affect the operation of the [Federal Power Act]."

The conclusions stated are further enforced by the regular congressional and administrative practice over a period of many years. So far as I can determine, whenever it is intended that national parks or monuments may be used in part for reclamation or power projects, the authorizing legislation or proclamation so states. The reservation by President Roosevelt of the Brown Reservoir site is one example. Other examples are found in the statutes setting

up the Glacier National Park (16 U. S. C., sec. 161); Rocky Mountain National Park (16 U. S. C., sec. 191); Lassen Volcanic National Park (16 U. S. C., sec. 201); and Grand Canyon National Park (16 U. S. C., secs. 221, 227).

The first three of these statutes state that certain lands are:

" * * * reserved and withdrawn from settlement, occupancy, disposal, or sale under the laws of the United States, and said tracts are dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people of the United States * * *."

These statutes then further provide:

"The United States Reclamation Service may enter upon and utilize for flowage or other purposes any area within said park which may be necessary for the development and maintenance of a Government reclamation project. * * *"

Section 227 of United States Code, title 16, relating to the Grand Canyon National Park, provides as follows:

"Whenever consistent with the primary purposes of said park, the Secretary of the Interior is authorized to permit the utilization of areas therein which may be necessary for the development and maintenance of a Government reclamation project."

In volume 57 of the Congressional Record, page 1770 (57th Cong., 8d sess.), a question was raised in the House as to the need of granting authority for irrigation and reclamation projects in the Grand Canyon National Park. The following is the reply by the sponsor of the bill:

"The provisions contained in the bill would authorize the Secretary of the Interior, when consistent with primary purpose of the park—that is not to impair its scenic beauty—to allow storage reservoirs to be constructed for conserving the water of the Colorado River for irrigation purposes. I understand that there are in the canyon a number of reservoir sites where it is proposed in time, when full utilization is made of that stream, to build reservoirs for the storage of water. If that can be done without disturbing the primary purpose of the parks, there is authority in this bill to do so."

I think the converse is equally clear, namely, that in the absence of such specific authorization, the Secretary of the Interior has no power to invade any public park or monument for such a purpose. Since no specific authorization has been given by Congress with respect to the use of Dinosaur National Monument, I conclude that this monument is not presently subject to use by the Department of the Interior under the Reclamation Act.

See also on this point 38, Opinions of the Attorney General, 310, which also discusses the difference between power and reclamation projects.

Finally, there has been what amounts to an official determination by the Secretary of the Interior of the necessity of seeking legislative authority for use of Dinosaur in the Colorado River project. Evidence of this determination may be found in a letter received by the undersigned from the Assistant Commissioner of the Bureau of Reclamation, dated December 10, 1952, copy of which is annexed as appendix D. Pursuant to this determination, three separate bills (H. R. 890, H. R. 9014, and S. 3839) were introduced at the 81st session of Congress, but none was enacted. It follows that the executive branch of the Government is still without authority to proceed with this project.

MANLY FLEISCHMANN,
Attorney at Law.

APPENDIX A

DEPARTMENT OF THE INTERIOR,
Washington, October 17, 1904.

The DIRECTOR OF THE GEOLOGICAL SURVEY.

SIR: In compliance with the recommendation of the Acting Director in a letter of the 13th instant to the Department, and in a letter of today to the Commissioner of the General Land Office, I have temporarily withdrawn the public lands in the States of Colorado and Utah within the areas described in the letter of the Acting Director from any form of disposition whatever for irrigation works, under the first form of withdrawal authorized by section 3 of the act of June 17, 1902 (32 Stat. 388), and have directed him to cause the proper notation to be made on the records to show the withdrawal of these lands while unsurveyed, as well as after the survey has been made.

This withdrawal is for the Brown's Park Reservoir site, under the Green River project.

Very respectfully,

THOS. RYAN, *Acting Secretary.*

GEOLOGICAL SURVEY,
October 13, 1904.

Re Green River project, Utah-Colorado.

The honorable the SECRETARY OF THE INTERIOR.

SIR: I have the honor to recommend that the following-described lands, excepting any tracts the title to which has passed out of the United States, be withdrawn from public entry, for irrigation works, under the first form of withdrawal, as provided in section 3, act of June 17, 1902 (32 Stat. 388) :

Green River project, Utah-Colorado, Brown's Park Reservoir site, sixth principal meridian, Colorado

Townships	Ranges	Sections
North:	West:	
8.....	102.....	All secs. 5 to 8, inclusive.
9.....	102.....	All secs. 2 to 11, inclusive.
		All secs. 15 to 22, inclusive.
		All secs. 29 to 32, inclusive.
10.....	102.....	All secs. 17 to 21, inclusive.
		All secs. 28 to 34, inclusive.
9.....	103.....	All sec. 1.
		All secs. 4 to 10, inclusive.
		All secs. 13 to 18, inclusive.
		All secs. 20 to 28, inclusive.
		All secs. 35 and 36.
10.....	104.....	All secs. 1, 2, 11, 12, 13, 14.

Salt Lake meridian, Utah

Townships	Ranges	Sections
North:	East:	
1.....	25.....	All secs. 1 to 14, inclusive.
2.....	25.....	All secs. 18, 19, 30, 31, and 34.
2.....	24.....	All secs. 13 and 14; 18 to 25, inclusive; 28, 29, and 36.

It is possible that some of this land is unsurveyed, in which case it is requested that appropriate notation be made on the records to show the withdrawal thereof while unsurveyed as well as after survey has been made.

Very respectfully,

MORRIS BIEN, *Acting Director.*

APPENDIX B

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SOLICITOR,
Washington, November 8, 1924.

The honorable the SECRETARY OF THE INTERIOR.

DEAR MR. SECRETARY: In my opinion rendered June 27, 1924, it was held that the inhibition contained in the act of March 3, 1921 (41 Stat. 1353), against the issuance of permit or other authorization for the construction of reservoirs or other works for the storage or carriage of water within the limits of any national park or national monument without specific authority of Congress, is applicable in the case of the proposed construction of a canal by the Government across the Casa Grande National Monument in Arizona, and that it will be necessary to obtain the consent of Congress thereto.

I am now in receipt of a letter of October 27, 1924, from the Acting Commissioner of Indian Affairs requesting reconsideration of the question.

Two grounds are urged for reversal of that opinion. The necessity for early construction of this project for the benefit of the Indians is emphasized, and

the delay which would be occasioned by awaiting the action of Congress deprecated. While this argument affords reason for prompt action looking to the procurement of the needed legislation, it fails to reach the objection that existing law forbids such construction. It seems pertinent also to observe that this lateral as proposed crosses certain private lands over which the Government must acquire rights-of-way, and authorization from Congress will likewise be required before construction can proceed on that part of the project. Therefore some delay appears to be inevitable, but doubtless these two items can be equally expedited.

But it is further urged that where the Government itself desires to construct a canal across such reserved land, the case is entirely different from that where a private concern is seeking right-of-way. In my opinion there is no difference so far as the act of March 3, 1921, is concerned. The object of that law was the protection of the national parks and national monuments, and that protection Congress reserved unto itself.

Whether such a canal be injurious to a national monument is not dependent at all upon whether it is constructed under direct supervision of this Department for the benefit of Indians or by a private company for other water users. In either case it is appropriate for this Department as administrator of such reservations to inform Congress in respect to the desirability of permitting such use. Should this Department be of opinion that such use would not be detrimental to the purposes of the reservation, that fact alone would not be sufficient to justify permission for such construction without the consent of Congress. That body has seen fit to retain in itself the power of final decision in the matter.

I must, accordingly, adhere to the views expressed in the former opinion.

Respectfully,

JOHN H. EDWARDS, *Solicitor.*

Approved: November 8, 1924.

E. C. FINNEY, *Acting Secretary.*

APPENDIX C

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SOLICITOR,
Washington, July 19, 1935.

The honorable the SECRETARY OF THE INTERIOR.

MY DEAR MR. SECRETARY: The Bureau of Reclamation has under consideration the proposed Grand Lake-Big Thompson transmountain diversion project by which it is planned to carry water from the headwaters of the Colorado River to the plains east of the Rocky Mountains for irrigation and power purposes. The water would be diverted from the Colorado River Basin into the South Platte Basin of eastern Colorado by means of a tunnel passing through the Rocky Mountains. The proposed tunnel would pass for a distance of approximately 12 miles under the Rocky Mountain National Park. I have been requested to consider the legality of the prosecution of this project by the Reclamation Service within the park area.

The act of January 26, 1915 (38 Stat. 798), which provides for the establishment of the Rocky Mountain National Park contains the following provision:

"*Provided*, That the United States Reclamation Service may enter upon and utilize for flowage or other purposes any area within said park which may be necessary for the development and maintenance of a Government reclamation project."

In my opinion the foregoing provision contains existing authority for the Reclamation Service to enter upon the park area and prosecute the proposed project.

My attention has been directed to the act of March 3, 1921 (41 Stat. 1353), which is amendatory of the Federal Water Power Act of June 10, 1920 (41 Stat. 1063), and provides in part:

"That hereafter no permit, license, lease, or authorization for dams, conduits, reservoirs, powerhouses, transmission lines, or other works for storage or carriage of water, or for the development, transmission, or utilization of power, within the limits as now constituted of any national park or national monument shall be granted or made without specific authority of Congress * * *."

While I believe the restrictions of this act apply to Federal irrigation and power projects as well as those undertaken by private persons (Solicitor's Opin-

ion of November 8, 1924, M. 12896. Also see *United States v. Arizona*, — U. S. — 55 S. Ct. 866, 869), I do not believe that this general act repealed or in any way rescinded the specific authorization contained in the Rocky Mountain National Park Organic Act.

Implied repeals are not favored (*Washington v. Miller* (235 U. S. 422); *United States v. Burroughs* (289 U. S. 159)). This rule especially applies where, as in the instant case, the prior law is a special act relating to a particular case or subject and the subsequent law is general in its operations (*Petri v. Oreckman Lumber Co.* (199 U. S. 487)). It is well settled that ordinarily a special act is not repealed by a later general act relating to the same subject unless express provision therefor is contained in the later act or unless the two acts are irreconcilably conflicting. The special act remains an exception to the general act (*Rodgers v. United States* (185 U. S. 83); *United States v. Nix* (189 U. S. 199); *Washington v. Miller, supra*). The absence of conflict between the two acts under consideration is readily discernible upon examination of their provisions. By the later general act, Congress intended to safeguard national parks and monuments from unauthorized construction of irrigation or power projects, and to reserve to itself the exclusive power to authorize the prosecution of such projects in those areas. This reservation was made necessary by the delegation to the Federal Water Power Commission of authority to authorize projects of this character. By the earlier special act, Congress had specifically exercised the power which it later saw fit to reserve exclusively to itself. Consequently, rather than being in conflict, the two acts are in complete harmony.

Therefore, I believe the specific authorization contained in the act of January 26, 1916, *supra*, has not been repealed or rescinded and as a result of that express authorization the diversion tunnel contemplated in the Grand Lake-Big Thompson transmountain project, if otherwise proper, may be constructed within the Rocky Mountain National Park area by the Reclamation Service.

Respectfully,

Approved: July 19, 1935.

NATHAN R. MARGOLD, *Solicitor.*

HAROLD L. ICKES,
Secretary of the Interior.

APPENDIX D

UNITED STATES DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D. C., December 10, 1952.

MR. MANLY FLEISCHMANN,
COHEN, FLEISCHMANN, AUGSPURGER, HENDERSON AND CAMPBELL,
Ellicott Square Building, Buffalo, N. Y.

MY DEAR MR. FLEISCHMANN: By your letter of November 26 you asked us, in effect, if the proposed upper Colorado River storage project may be authorized by a secretarial finding of feasibility in view of the fact that the construction of the project would involve the use of lands within the Dinosaur National Monument.

Since it has been administratively decided to seek specific congressional authorization of the proposed upper Colorado River storage project, the question has not been considered by us. Therefore, I am sure that you will understand why we cannot advise you whether or not we agree with the views expressed in your letter.

Sincerely yours,

G. W. LINEWEAVER,
Assistant Commissioner.

NATIONAL PARKS ASSOCIATION,
Washington 9, D. C., July 2, 1954.

To the Senate Subcommittee of the Committee on Interior and Insular Affairs,
Considering S. 1555, to Authorize the Upper Colorado Storage Project:

Having listened to testimony presented to the House and Senate subcommittees, I should like to make a few comments, specifically relating to the proposed Echo Park Dam and Dinosaur National Monument.

The question is whether or not we are to have a national park and monument system. To build Echo Park Dam in Dinosaur National Monument would be a violation of the national policy governing the system, and would set a precedent for eventual ruin of the whole system. It will open the door not only to construction of other dams now proposed for other parks and monuments, but it will start a trend toward invasion of the system with various forms of commercial exploitation. Either we shall have a national park system intact and inviolate, or else we shall begin now the deterioration of the system, until there will be a system in name only. We cannot both have it, and at the same time exploit it commercially. The park system must never become a political football.

If the Bureau of Reclamation would drop Echo Park Dam, the project could get underway without delay. Many have wondered why the Bureau clings bulldog-like to this single project, when by merely dropping it, the work on the proposed dams could begin.

This writer made a visit through Utah and Colorado, and also visited the monument in question. He found that there was a need for water, especially in some parts of Utah. But he found an amazing lack of understanding on the part of the people. They believed they were to get water from Echo Park Reservoir, having been told that Dinosaur National Monument was Utah's last waterhole. Those with whom he talked did not know that Echo Park Dam was only one of nearly 30 projects for the upper basin States. The writer talked with a newspaper editor who had been publishing promotion material for Echo Park Dam. In conversation, it was revealed that this editor was as lacking in a knowledge of some important facts as was the rest of the population, and he admitted he would have to "read up on it." How, may I ask, can the people know the truth, if those whose job it is to shape public opinion do not themselves care to find out the truth?

In conversation with a resident of Vernal, Utah, the town pushing hardest for Echo Park Dam, the writer was informed, "but what we are really interested in is a business boom." By attracting visitors, the parks and monuments often do contribute to local welfare, but this is not to be brought about through commercial exploitation of their material resources.

We have heard it reiterated that in the opinion of some, Echo Park Reservoir will improve the beauty of Dinosaur National Monument. It is not a question of whether anyone thinks the artificial lake will improve the monument or not; the fact is that national parks and monuments are established to preserve great scenery and primitive landscapes, outstanding geologic and other natural wonders as nature made them. They are not to be altered to conform to any human idea of how they ought to look, or how they can be "improved." National parks and monuments are to preserve and exhibit the wonders and beauties of nature—not the works of man.

After spending five days exploring the monument, it was the writer's opinion that the area, Dinosaur National Monument, is of national park caliber, and should be so redesignated.

Respectfully submitted.

DEVEREUX BUTCHER,

Field Representative Editor, National Parks Magazine.

**STATEMENT ON BEHALF OF IZAAK WALTON LEAGUE PRESENTED
BY JOHN F. CLAGGETT, WASHINGTON, D. C., IN BEHALF OF J. W.
PENFOLD, WESTERN REPRESENTATIVE OF THE IZAAK WALTON
LEAGUE, DENVER, COLO., RELATIVE TO THE PROPOSED UPPER
COLORADO RIVER STORAGE PROJECT**

Gentlemen, the Izaak Walton League of America is a not-for-profit organization composed of lay conservationists located in all the 48 States and Alaska, mostly organized in local chapters and State divisions. The league is dedicated to the conservation and wise use of the Nation's soil, woods, waters, and wildlife and has no special interest other than the long-term best interests of all the people.

In the interests of time, and conforming to the request of your chairman, we shall not reiterate the factual data upon which the league bases its position with respect to the upper Colorado River storage project. That data and our reasoning has been rather fully expressed heretofore and is available for your study. We shall, however, take a few moments to summarize that position.

First, it should be made quite clear that the league endorses the basic purposes of the upper Colorado project. This is not idle "lip service," but rather is the result of study by league members living in all the States of the Colorado Basin who have devoted attention to the problem over the years. It is correct to state that development of the Colorado River is essential and inevitable.

Secondly, it should be made quite clear that the league is thoroughly opposed to the construction of Echo Park Dam within Dinosaur National Monument, as unnecessary destruction of a spectacular and irreplaceable scenic resource and an unnecessary violation of the time-proven national-park policy. This position is likewise taken from first-hand investigations within Dinosaur National Monument by league members and personnel, and from our more than three decades of experience with the problems and values of our great national park system.

The league, along with almost every other conservation organization, has pointed out what appear to be feasible and acceptable alternative means and methods whereby the purposes of the Colorado River program can be achieved without the sacrifice of Dinosaur National Monument. Proponents of the project, relying on data furnished by the Bureau of Reclamation, have insisted there is no alternative to Echo Park. Particularly, during the past 4 years, they have emphasized the presumably unanswerable argument that alternatives would result in prohibitive increases in reservoir evaporation losses.

It is interesting and perhaps significant that layman conservationists have been able to pick out rather glaring errors in that argument and the data supporting it: that the Bureau of Reclamation and the Department of the Interior have subsequently conceded the errors. Thus, at least as far as one alternative is concerned—the higher Glen Canyon Dam—the evaporation argument has itself evaporated.

It is incredible that these errors should have occurred. The errors suggest the possibility that the Echo Park proposal has all along been a Bureau of Reclamation "crash program"—for some reason to be forced through to authorization, regardless of other considerations, regardless of alternative possibilities.

We don't believe our Nation will ever be able to afford such carelessness in planning and promotion when cherished institutions are at stake. We doubt that the sincere citizens who have been led to believe their futures depend upon Echo Park would wish it authorized on any such basis.

We appreciate the fear in the hearts of upper Colorado River folk that delay in plans for development of their river, their "last water-hole," might result in permanent loss of opportunity for development of their share of the river, so absolutely essential to the development of the great natural resources of that region. They should be given tangible assurance that this opportunity shall not be denied them. At the same time, and because in a very real sense we are dealing with a

“last waterhole,” we cannot afford any major mistakes. Whatever plan of development is adopted, we shall, for better or worse, be placing our future in a straitjacket. The obligation and responsibility of this generation of citizens is to make certain that the jacket will fit the future comfortably and well. There can be no second guessing once projects as huge as the upper Colorado have been constructed.

We urge, consequently, that your distinguished committee, which has consistently over the years supported and protected the great public institution which is the national park system, support and protect Dinosaur National Monument, as yet little known but destined to be a key and strategic area in that system.

We urge also that your committee consider for as early authorization as possible an initial phase of development for the upper Colorado, excluding Echo Park Dam, but including such units as are clearly sound and feasible and will contribute to desirable utilization of the region's great resources.

On behalf of the Izaak Walton League of America, I wish to express appreciation for the opportunity to present our opinions on this important matter.

**STATEMENT BY CHAS. H. CALLISON, CONSERVATION DIRECTOR,
NATIONAL WILDLIFE FEDERATION, ON S. 1555**

There seems little necessity of reviewing the facts which are being presented to support the objections raised by law and professional conservationists over the country to S. 1555 and its companion measure, H. R. 4449, which provide for construction of Echo Park Dam within the boundaries of Dinosaur National Monument. Our case, once having been completed, will leave this committee with the great responsibility of seeking out the decision which must serve the best interests of the people of our Nation.

It sometimes appears that at this stage in history, when the diversity and expanse of human knowledge extends so far beyond the horizons of any one individual's understanding, and the problems of our society are of unprecedented complexity, that some of the more basic values in our American way of living are in danger of being lost in the shuffle. In appearing before this committee, we wish to focus the attention of its distinguished members on some of the principles and facts which in the past have guided the Congress in the management and use of publicly owned recreational areas.

Occasionally we find ourselves involved in controversy when the human tendency is to seek the path of least resistance and let the future take care of itself. But there comes a time when we cannot abandon our obligation to future Americans, and we are faced with a proposition which must be defeated if some of our most cherished values are to be preserved. Such a case is the proposed destruction of the natural and unequalled beauty of the Yampa and Green Canyons within Dinosaur National Monument. To leave the challenge unmet would mean the loss of something that is deep in the heritage of the American people which, once destroyed, could never be replaced. Even more important, a precedent would be established that would threaten the sanctity of our national park system.

Now, you may question, and quite justly it seems to me, the testimony of those of us who set the stakes so high by declaring that this would constitute an irreparable loss. What justifies our opposition to this legislation that we choose to label a catastrophic threat to our national park system? These questions are deserving of the best answers we can provide, and it is our hope that the testimony we offer will aid the committee in reaching a decision which upholds the highest principles and concepts of recreational uses of publicly owned lands.

We Americans speak with pride of our forefathers who, in less than 200 years, have hewn a nation from a wilderness, a nation that is beyond comparison in its wealth of natural and human resources and industrial production. Most of us relate the sacrifices of our own fathers and grandfathers who led lives in which hardships were taken for granted, and survival often was completely dependent on a man's own ability to care for himself and his family.

In a day when nearly two-thirds of the American people live in cities and towns far removed from the countryside, the significance of this backwoods heritage may not be fully apparent. We must recognize that it has not been until recent decades that the American people themselves began to realize the loss they had suffered from the very rapid change in their culture brought about by the migration to urban centers and the new folkways that were foreign to their rural life. The transition now appears to be complete and most of us find ourselves well settled in the environs of the city. But how deeply engraved is the urge for outdoor living that was so amply satisfied in our fathers' day? How much has it come to mean to us, and what does it represent in terms of much-needed releases from the tensions of our modern pace of living?

Dr. Olaus Murie, president of the Wilderness Society, and one of the leading authorities on the subject of wilderness values, has said that the appreciation of the American public for natural areas is a matter of the maturing of our culture. One has only to take a Sunday afternoon drive from Washington to nearby Shenandoah National Park or along the Chesapeake and Ohio Canal to fully appreciate the intensity of city dwellers' need to get out in the open. Sometimes the throngs that line the highways and fill the picnic grounds to overflowing prevent our fullest enjoyment of the solitude (or escape) that we make be seeking. Many of us do not recognize the drive that compels our egression, but that it is there is amply demonstrable. We are not talking about theories, gentlemen, we are talking about facts. Last year over 22 million visits were made to our national parks and monuments providing outdoor recreational facilities. Another 35 million fished, hunted, hiked, and enjoyed other outdoor pastimes within our national forests. Those millions have a real stake in this legislation. The annual sales within recent years of 28 million hunting and fishing licenses demonstrates further the interest in the outdoors which takes the American public to our Nation's recreational areas. Excluding those who are allowed to go afield for fish and game without the regularly required licenses, this number represents nearly 1 person out of every 6 men, women, and children in the country. In addition to the use of public lands, tens of millions of people visited private lands, some of which will not be able to withstand heavier recreational demands if their owners are to depend upon them for a livelihood.

We have come to accept as a part of our modern philosophy that the man outdoors is at his best, whether he is on a fishing or hunting trip, or just out roaming the fields and forests. The renewal of energies, enthusiasms, and interests that come about from this type of recreation cannot be brought about in any other way. There is no substitute for the "outdoor" cure.

In the young life of the conservation movement in this country, it is not surprising that many people who seek the benefits of our recreational areas do not fully appreciate the responsibility which goes with their privileges of tenure. Yet, there are many encouraging signs which give unmistakable evidence that conservation, as a guiding force and a concept which will mold our Nation's future, is coming into its own. Possibly some of the best evidences of this are the organizations represented at this hearing. While young in comparison to our country's history, we now speak for millions of conservationists who have steadfastly supported programs to preserve and insure the sanctity of areas against threats of the kind which is being faced here today. Our ranks grow rapidly as we draw on the millions of citizens that enjoy the outdoors. Our memberships represent an important and rapidly growing segment of the public that is learning of the sadly neglected facilities of our national parks and monuments, the national forests, and other public lands. This is a public that is beginning to recognize the urgency for development of adequate road and trail systems, and the need for installation of outdoor facilities sufficient to meet the tide of humanity which washes over these areas during the busy seasons. The inadequacy of appropriations to the agencies administering these resources is being recognized as a denial of the wholesome enjoyment of public recreation areas that could be afforded the American people.

The West is fortunate with its abundance of public areas where people can get outdoors. This contrasts sharply to many parts of the East where every public outdoor facility is crowded to its capacity. Frequently the overcrowded conditions cause the loss of much of the natural appeal which originally made these areas attractive. Proper maintenance of them is a tremendous task, not to be accomplished with the inadequate appropriations of recent years.

We do not have to go far from this room to find examples of what I describe. One instance is seen at the beautiful Great Falls of the Potomac, which on a busy Sunday must be viewed from solid columns of people who line the narrow, inadequately maintained system of trails and catwalks. This is not a reflection on the administering agency which has managed to do so much with limited appropriations, but on that segment of the public that fails to recognize and express the need for this type of development in constructive terms that can be fully appreciated by our leaders, some of whom we have had the honor of appearing before today. At the same time, there can be no denial that our cause is gaining momentum. Every day we witness the growth of concern for the perpetuation and wise use of our natural resources. The nationwide expression of opposition to the Echo Park project is one of the more recent and most striking instances of the public's acceptance of this growing responsibility.

For us here today to permit the destruction of an area that was recognized by the Federal Government for its unique and unequaled

scenery is a betrayal to both the confidence of yesterday's men of foresight and tomorrow's citizens. With our Nation's spiraling population and the completion of comprehensive and fully integrated plans for bringing about the development of the Colorado River water resources, no one will deny that the Southwest will change rapidly. Its population will mushroom as whole areas are placed under cultivation and industry moves in to utilize the abundant mineral and agricultural resources. Additional incentive will be provided industry in the form of cheap atomic power that we are told to expect within a few years. The continued reduction in traveling time enabled by modern technology will make possible visits to this area by people from all corners of the Nation. Any denial of protection to Dinosaur National Monument at the present time, when the future points to unequaled demands for this kind of natural area, would be an everlasting monument to our lack of foresight. Even today, an adequate system of trails and roads would make the monument accessible to thousands of people who will never enjoy its very unique beauty in the present undeveloped state. A postponement of the time when the values of this area can be fully appreciated does not, of course, justify the destruction of its most striking features by building the proposed dam at Echo Park.

Gentlemen, today we find ourselves involved in a controversy which touches on some of the most basic principles of public use and ownership of our national parks and monuments. To attempt to define in monetary terms the values at stake would leave us far short of true appreciation of the great potential that could be lost—the recreation and enjoyment, a place for reestablishing peace of mind, strength of soul, and health of body that we now have represented in this nationwide system. We are presently witnessing a rapid awakening in the American people to values represented here, and it is our hope that these will be fully recognized by you, who, through this committee, can insure their preservation.

In conclusion, I wish to restate in unmistakable terms the position of the National Wildlife Federation. It has not changed since the House Irrigation Subcommittee held hearings on H. R. 4449. We are opposed to the phases of this legislation which would authorize Echo Park Dam. We believe the purposes of the upper Colorado storage project can be achieved without this particular reservoir. We urge the consideration of alternate sites.

On behalf of the National Wildlife Federation I wish to thank you for the opportunity and privilege of presenting our views.

**RESOLUTION, THE NATIONAL COUNCIL OF STATE GARDEN CLUBS, NEW YORK, N. Y.—
DINOSAUR NATIONAL MONUMENT**

In keeping with the spirit of the resolution of this organization on April 27, 1953, opposing boundary changes that might reduce the Olympic National Park, this organization recognizes the special value of each of our national parks and monuments and the necessity of maintaining these lands intact and natural.

Public sentiment was expressed during the administration of Abraham Lincoln, who signed the bill reserving the Yosemite Valley, and has reasserted itself innumerable times when proposals have been made which were inconsistent with the ideal of preservation as it has developed with the growing system of parks and monuments. We believe that this is as it should be.

The Dinosaur National Monument, on the northern boundary between Colorado and Utah, is extremely important for its fossil remains and canyon landscape. Science should have perpetual opportunity of studying here, both for itself and to answer our questions and those of our children about the origins of American life. Nothing should be done that would destroy these remnants or the unique valleys of the Colorado headwaters.

The scenic prominence of this and other areas in the park system cannot be equated with monetary gains that might be made from their exploitation, or so-called development. Dinosaur's value for its wild and peculiar scenery is increasing annually as more people see it, read of, or hear about it. Its very remoteness and untouched nature give it unusual piquance in the imaginations of many who will never visit it. Its importance may be said to be inverse to the degree that any agency or person commercializes its resources.

With other conservationists, we look ahead to decades of rapidly expanding population, more leisure, higher mobility, and greater proportion of the retired-age classes. We have a few fears for our future ability to provide them with the material needs of life if sound conservation practices are adopted on lands now producing food, fiber, energy, impounded water, or space for construction. If such practices are not realized, it is impossible to conceive that the use of materials or energy extracted from such areas as Dinosaur will have any effect on our survival. On the contrary, it would destroy essential recreational resources that will be needed urgently, not for the pocket or stomach but in the minds and hearts: Therefore be it

Resolved, That the National Council of State Garden Clubs, meeting in New York on January 14, 1954 (1) strongly opposes any action that might be detrimental to the scenic, recreational, and scientific value of Dinosaur National Monument; (2) directs the resources of its membership of some 300,000 by the spread of information toward safeguarding the integrity of this or any other national park or monument that is threatened; and (3) urges fuller recognition as a matter of national policy of the increasing need for protection and expansion of resources yielding nonmaterial values to our developing population.

PAUL H. SHEPARD, Jr.,
Conservation Chairman.

STATEMENT OF C. R. GUTERMUTH

Mr. Chairman, I am C. R. Gutermuth, vice president of the Wildlife Management Institute of Washington, D. C., which is one of the oldest, nonprofit, national conservation organizations in this country. The institute is dedicated to the better management and wise utilization of renewable natural resources in the public interest, and the work of this private organization dates back to 1911.

I should like to make it clear at the start that we are not opposed to the upper Colorado River storage project in its entirety, since there probably is need for certain of the developments that are proposed by the Bureau of Reclamation. We do, however, want to voice vigorous objection to the inclusion of the Echo Park Dam in the initial phase of the project. We are opposed to, and will continue to oppose, any invasion of the national park system, of which the Dinosaur National Monument is an invaluable unit. In view of the increasing human population, it is imperative that we safeguard the comparatively small proportion of the total land acreage that has been set aside in the national park system for the cultural and recreational needs of this great Nation.

Granting that the upper Colorado should be developed, we have not been given ample justification for the construction of the Echo Park Dam. It will take years to build the other dams that are planned for that area, and we urge you to insist that they go ahead with those that are not in dispute, and that a detailed study be made of the alternate dam sites outside the Dinosaur National Monument. Then again, in

view of the real and urgent need for preserving our few publicly owned park areas in order to provide for those other equally important and essential needs of the people, is it illogical to suggest that it might be wise to sacrifice some efficiency and utility by staying out of the Dinosaur with this construction, and by using some of those so-called inferior dam sites?

Mr. Chairman, it seems strange, that although this controversy has been raging for years, the Bureau of Reclamation still has not made a detailed study of the alternative sites. The Bureau finally has admitted that it has been about 660 percent too high in its estimates of the water evaporation loss differential between Echo Park and the alternate sites. It is quite obvious that they are more interested in breaking down the barrier that has kept them from invading the national parks, national monuments, wilderness areas, and national wildlife refuges than anything else.

I wish to emphasize that it is abundantly clear to us why they have not considered those alternate sites outside the Dinosaur, which could meet the actual requirements. If the Bureau can establish a precedent by obtaining authorization for the construction of the Echo Park Dam, it soon will be getting into some of those other better known national parks and monuments. The Bureau never has been able to show that Echo Park is indispensable, nor is there definite proof that this facility actually is needed now, nor that it ever will be needed to meet the demands of that area. In order to attempt to justify this dam in its present program, the Bureau has been forced to reach a long way into the future in projecting anticipated needs. We urge the committee to make certain that this tremendous expenditure of public funds can be justified at this time, and that this dam is not being built merely to provide for future theoretical requirements.

The Bureau of Reclamation and the proponents of the Echo Park Dam have made much of the inaccessibility of Dinosaur National Monument. This is unfortunate, since the monument lies only a few miles off a heavily used transcontinental highway. Millions of people pass this scenic wonderland each year at 60 miles per hour, in their haste to get to some other park to spend their money. The area is unknown and inaccessible only because Congress has not provided for the construction of access roads and facilities. The Dinosaur National Monument can, with a small investment of public funds, become one of the most popular, natural, cultural, recreational areas available for public use. The influx of tourist trade, once this area has been developed properly, would provide the neighboring towns in Utah and Colorado with far greater long-term financial return than they would realize from that appealing construction boom. Thanks for your courtesy.

Senator WATKINS. I will call Mr. David D. Moffat, Jr., and Mr. Leroy R. Patterson. I understand they desire to testify together, Mr. Moffat will be the first witness.

You may proceed.

STATEMENTS OF DAVID D. MOFFAT, JR., VICE PRESIDENT OF THE UTAH POWER & LIGHT CO.; AND L. R. PATTERSON, PUBLIC SERVICE CO. OF COLORADO

Mr. MOFFAT. Mr. Chairman and members of the committee, I am David D. Moffat, Jr., vice president of the Utah Power & Light Co., and with me is Mr. L. R. Patterson, of the Public Service Co. of Colorado. We have a prepared statement that we would like to have made a part of the record and comment on that statement.

Senator WATKINS. You may proceed with that. Your statement will be placed into the record at this point.

(The statement is as follows:)

STATEMENT BY PRIVATE UTILITIES RE COLORADO RIVER STORAGE PROJECT

The following statement made on behalf of Arizona Public Service Co., Public Service Co. of Colorado, Public Service Co. of New Mexico, Southern Colorado Power Co., Southern Utah Power Co., Southern Wyoming Utilities Co., Telluride Power Co., the Western Colorado Power Co., and the Utah Power & Light Co., all operating utilities rendering electric service in the upper Colorado River Basin States, sets forth in general terms the factors bearing on potential markets for the disposition of electric energy proposed to be generated in connection with the Colorado River storage project, together with certain proposed principles for cooperation which we think would contribute in a substantial manner to the feasibility of the project in addition to effectuating a substantial savings on the part of the Federal Government in construction costs.

THE BASIN AREA

The upper Colorado River Basin has a drainage area of 110,000 square miles comprising the western part of the State of Colorado, the eastern part of Utah, the southwestern corner of Wyoming, the northwestern corner of New Mexico, and the northeastern corner of Arizona. It is an area of lofty mountains, high plateaus, deep canyons, fertile valleys, and great distances.

The basin is very sparsely populated. The average population density is approximately 3 persons per square mile, compared to a national average of approximately 51 persons per square mile. Its largest city is Grand Junction, Colo., with a 1950 population of 14,504 inhabitants.

BASIN RESOURCES

Contrasted with its sparse population is its great wealth of natural resources. These are the measure of its future potential. Here are found large deposits of nonferrous metals and other minerals such as gold, silver, copper, lead, zinc, molybdenum, vanadium, phosphate, gilsonite, limestone, and many others.

Other resources are large forest areas with potential pulp and other forest-product industries. Farming, including the growing of fruit and vegetables, and the livestock industry will continue to provide a basic source of wealth.

However, more important for the future than these is the fact that this basin is one of the greatest sources for thermal energy production to be found anywhere in the world. Here are located vast deposits of coal, great underground reservoirs of oil and natural gas, mountains of oil shale, and perhaps more important than all of these are the deposits of uranium ores. The potential thermal power resources of this area stagger the imagination.

But the present need of the basin is conservation and orderly development of its most vital resource—water. Water is scarce throughout the States of the Colorado River, both upper and lower basins. More than 30 years ago a compact was signed at Sante Fe, N. Mex., making an apportionment of the waters of the Colorado River between the upper and lower basins. In 1948 the upper basin States, i. e., Wyoming, Colorado, Utah, New Mexico, and Arizona, effected a compact apportioning among those States the water reserved for their use under the Sante Fe compact. In order to protect and develop its share of the water allocated under the compact, the upper basin must provide certain reservoirs for holdover storage. The Colorado River storage project, among other things, provides this storage.

These companies have a twofold interest in this project. First of all, they are concerned with the need for development of the water resources for domestic, agricultural, and industrial use within their service areas both within and without the Colorado River Basin. There is no substitute for water to meet these needs. The long-range growth and prosperity of their service areas is dependent upon additional supplies of water, and such water must of necessity come from the Colorado River and its tributaries.

Their second interest is in the utilization of the power produced in connection with the Colorado River storage project. These companies at the present time are the direct suppliers of electric service to approximately 680,000 electric consumers. Through wholesale service and wheeling service, they are indirect suppliers to an additional 111,000 electric consumers. Their interconnection with other systems further enlarge the electric service areas.

These companies operate 90 powerplants with a total capacity of 1,250,000 kilowatts, of which approximately 1 million kilowatts is steam capacity. The growth in the service areas of these companies is so great that they are adding more than 150,000 kilowatts of additional steam-generating capacity per year. In other words, it is estimated that in 1960 the combined steam-generating capacity of these companies will be approximately 2 million kilowatts. They presently have 6,150 miles of transmission lines interconnecting their plants and load centers, with some 1,900 miles additional planned by 1960.

Furthermore, ever-growing needs for electric power in each of our States will provide a market for the power which the project will produce, provided the new generating facilities are put into production on a schedule in consonance with the growing demands for power. We have consistently kept abreast of these growing needs through the construction of additional generating capacity and the extension of our transmission systems. Our plans for the future necessarily entail continuous additions to our generating and transmission capacity so that we shall always be in a position to fill growing needs. To the extent to which project power becomes available to us at costs reasonably

competitive with present or future generating costs, we would be relieved of the cost of constructing an equivalent amount of generating capacity and might be relieved from operating (except for peak and reserve generation) some of the older and higher-cost generating plants on our own systems.

We propose to absorb into our systems and to transmit to present and prospective customers in the upper Colorado River Basin States large blocks of electric power from the hydroelectric plants of the Colorado River storage project and participating projects.

We recognize the financial necessity, as an important adjunct to the Colorado storage project and participating projects, for the generation and sale of hydroelectric power. This necessity arises from the obvious need for a primary source of revenues to help return to the taxpayers of the United States the capital investment in the project as a whole. For that reason the output of these project plants should be disposed of on such basis and in such manner as will best assist the financial feasibility of the project.

PRINCIPLES FOR COOPERATION IN THE PROJECT

Careful consideration of the basic situation as outlined above suggests that there is real opportunity for cooperation between private enterprise and the Federal Government in connection with the marketing of power from the Colorado River storage project. The following are deemed by us to be basic principles for such cooperation:

1. Because of the relationship of the water-storage features of this project to the Colorado River compact, the vast areas encompassed, the magnitude and multiple-purpose objectives incorporated, including nonreimbursable features, we believe the holdover reservoirs and powerplants should be built by the Federal Government.

2. In order to obtain the maximum amount of firm power, the greatest diversity and flexibility in operation, and to make the power accessible to the greatest area, the backbone transmission tie line directly connecting major powerplants of the Colorado River storage project, such as Flaming Gorge, Echo Park, and Glen Canyon, except in cases where such interconnections can be more economically and feasibly accomplished through the present and projected transmission systems of the companies, should be an integral part of the generating system, and, therefore, should also be built by the Federal Government. The integration of other plants of the project constructed reasonably adjacent to the present and projected transmission systems of the companies should be accomplished through these systems; the benefits of such integration would accrue to the project without additional cost.

3. In order to obtain maximum flexibility and lowest cost in transmission, it is essential that use be made of the then existing transmission systems of the companies and in addition the companies construct such new transmission lines from the project plants or project interconnecting transmission tie lines to the various load centers of their respective systems as may be required to market project power, the Government or other agencies to construct necessary and nonduplicating transmission lines to other load centers not within the general service areas of these companies.

4. The private utilities are willing to enter into contracts whereby they will deliver project power to preference customers making such reasonable transmission charges therefor as may be approved by the local regulatory authorities; or, the private utilities are willing to contract directly with the preference customers to supply all their power requirements at rates which will pass on such savings as are obtained through the purchase of project power.

5. We believe that the financial feasibility of the project depends upon the sale to private utilities of the power output of the project plants not contracted for by such customers as may be entitled to preference, and that such sales should be made at the powerplants or along the backbone transmission tie line upon terms such that the cost of project power will not exceed the cost of power from alternate sources.

6. Each company as to its rates and charges is subject to the jurisdiction of the State utility commission in which it is furnishing electric service to the public. Rates charged by such utilities for electric service, taking into consideration the cost of power purchased from project plants, will be subject to the full jurisdiction of the appropriate State utilities commission.

To carry out successfully the foregoing principles, it is essential that an understanding be reached in order that these companies may henceforth plan, design, and construct new generating and transmission facilities to coordinate with the project development. The general premises of this understanding should be incorporated in the legislation authorizing the project.

Mr. MOFFAT. This statement is made on behalf of the following investor-owned electric utilities: Arizona Public Service Co., Public Service Co. of Colorado, Public Service Co. of New Mexico, Southern Colorado Power Co., Southern Utah Power Co., Southern Wyoming Utilities Co., Telluride Power Co., the Western Colorado Power Co., and the Utah Power & Light Co., all operating electric utilities rendering electric service in the upper Colorado River Basin States, and sets forth in general terms the factors bearing on potential markets for the disposition of electric energy proposed to be generated in connection with the Colorado River storage project, together with certain proposed principles for cooperation which we think would contribute in a substantial manner to the feasibility of the project in addition to effectuating a substantial savings on the part of the Federal Government in construction costs.

The upper Colorado River Basin area and its great wealth in natural resources have been well described by other witnesses.

The potential thermal power resources in coal, oil, gas, and uranium which are abundant in the area stagger the imagination.

But the present need of the basin is conservation and orderly development of its most vital resource—water. Water is scarce throughout the States of the Colorado River.

These companies, which Mr. Patterson and I represent, have a twofold interest in this project. First of all, they are concerned with the need for development of the water resources for domestic, agricultural and industrial use within their service areas both within and without the Colorado River Basin. There is no substitute for water to meet these needs. The long-range growth and prosperity of their

service areas is dependent upon additional supplies of water, and such water must of necessity come from the Colorado River and its tributaries.

Their second interest is in the utilization of the power produced in connection with the Colorado River storage project. These companies at the present time are the direct suppliers of electric service to approximately 680,000 electric consumers. Through wholesale service and wheeling service, they are indirect suppliers to an additional 111,000 electric consumers. Their interconnections with other systems further enlarge the electric-service areas.

These companies operate 90 powerplants with a total capacity of 1,250,000 kilowatts of which approximately 1 million kilowatts is steam capacity. The growth in the service areas of these companies is so great that they are adding more than 150,000 kilowatts of additional steam generating capacity per year. In other words, it is estimated that in 1960 the combined steam generating capacity of these companies will be approximately 2 million kilowatts. They presently have 6,150 miles of transmission lines interconnecting their plants and load centers with some 1,900 miles additional planned in 1960.

Furthermore, evergrowing needs for electric power in each of our States will provide a market for the power which the project will produce, provided the new generating facilities are put into production on a schedule in consonance with the growing demands for power.

We have consistently kept abreast of these growing needs through the construction of additional generating capacity and the extension of our transmission systems.

Our plans for the future necessarily entail continuous additions to our generating and transmission capacity so that we shall always be in a position to fill growing needs.

To the extent to which project power becomes available to us at costs reasonably competitive with present or future generating costs, we would be relieved of the cost of constructing an equivalent amount of generating capacity and might be relieved from operating—except for peak and reserve generation—some of the older and higher cost generating plants on our own systems.

We propose to absorb into our system and to transmit to present and prospective customers in the upper Colorado River Basin States large blocks of electric power from the hydroelectric plants of the Colorado River storage project and participating projects.

We recognize the financial necessity, as an important adjunct to the Colorado storage project and participating projects, for the generation and sale of hydroelectric power. This necessity arises from the obvious need for a primary source of revenues to help return to the taxpayers of the United States the capital investment in the project as a whole. For that reason the output of these project plants should be disposed of on such basis and in such manner as will best assist the financial feasibility of the project.

PRINCIPLES FOR COOPERATION IN THE PROJECT

Careful consideration of the basic situation as outlined above suggests that there is real opportunity for cooperation between private enterprise and the Federal Government in connection with the mar-

keting of power from the Colorado River storage project. The following are deemed by us to be basic principles for such cooperation:

1. Because of the relationship of the water-storage features of this project to the Colorado River compact, the vast areas encompassed, the magnitude and multiple-purpose objectives incorporated including nonreimbursable features, we believe the holdover reservoirs and powerplants should be built by the Federal Government.

2. In order to obtain the maximum amount of firm power, the greatest diversity and flexibility in operation and to make the power accessible to the greatest area, a backbone transmission tie line directly connecting major powerplants of the Colorado River storage project, such as Echo Park and Glen Canyon, except in cases where such interconnections can be more economically and feasibly accomplished through the present and projected transmission systems of the companies, should be an integral part of the generating system, and therefore, should also be built by the Federal Government. The integration of other plants of the project constructed reasonably adjacent to the present and projected transmission systems of the companies should be accomplished through these systems; the benefits of such integration would accrue to the project without additional cost.

3. In order to obtain maximum flexibility and lowest cost in transmission, it is essential that use be made of the then-existing transmission systems of the companies and in addition the companies construct such new transmission lines from the project plants or project interconnecting transmission tie lines to the various load centers of their respective systems as may be required to market project power, the Government or other agencies to construct necessary and nonduplicating transmission lines to other load centers not within the general service areas of these companies.

4. The investor-owned utilities are willing to enter into contracts whereby they will deliver project power to so-called preference customers making such reasonable transmission charges therefor as may be approved by the local regulatory authorities; or, the private utilities are willing to contract directly with the preference customers to supply all their power requirements at rates which will pass on any such savings as are obtained through the purchase of project power.

5. We believe that the financial feasibility of the project depends upon the sale to private utilities of the power output of the project plants not contracted for by such customers as may be entitled to preference, and that such sales should be made at the powerplants or along the backbone transmission tie line upon terms such that the cost of project power will not exceed the cost of power from alternate sources.

6. Each company as to its rates and charges is subject to the jurisdiction of the State utility commission in which it is furnishing electric service to the public. Rates charged by such utilities for electric service, taking into consideration the cost of power purchased from project plants, will be subject to the full jurisdiction of the appropriate State utilities commission.

To carry out successfully the foregoing principles, it is essential that an understanding be reached in order that these companies may henceforth plan, design, and construct new generating and transmission facilities to coordinate with the project development. The general premises of this understanding should be incorporated in the legislation authorizing the project.

Mr. Chairman, that concludes the formal statement, but we both have just a couple of very brief comments we would like to add.

You remember the concluding paragraph of the statement that I just read outlined an area that we think should be incorporated in the legislation.

Therefore, we would like to offer for your consideration the following proposed amendment. At the end of section 1, line 18, page 3, after the word "project" add the following:

Provided, That the authority conferred by Section 1 of this Act to construct transmission lines is limited to:

(1) Backbone transmission tie lines directly interconnecting powerplants in units of the Colorado River storage project, directly interconnecting such plants with powerplants of participating projects, or directly interconnecting plants authorized in this Act with other Federal powerplants, where such interconnections cannot be more economically and feasibly accomplished through the present and projected transmission systems of electric utilities operating in the States of the upper Colorado River Basin;

(2) transmission lines between powerplants of participating projects which cannot be more economically and feasibly interconnected by the extension of present or projected transmission lines of electric utilities operating in the States of the upper Colorado River Basin; and

(3) transmission lines to municipalities or other public corporations or agencies desiring to purchase electricity and having a preference thereto by law where there are not existing or projected transmission lines which may reasonably be connected with the aforementioned powerplants or interconnection transmission tie lines between said plants, and where the Secretary is unable to contract with electric utilities to deliver such electricity at charges therefore approved by him and by local authorities having jurisdiction.

While the House committee did not incorporate any such language in their bill, I feel sure they agree in principle and I would like to call your attention to the House Report No. 1774 on H. R. 4449 and particularly to the top of page 10 and the section entitled "Proposal of the Private Power Companies" on page 23 of their report.

One observation I have made during the course of these hearings is the repeated references to the need for electric power in the upper basin States. Of course, this is not true. There has never been a power shortage in our areas and as far as I have been able to determine no industry has failed to locate in the States of the upper Colorado Basin because of the lack of electric power. These companies we represent are installing generating capacity as fast as the present and anticipated needs of their customers require, and we can continue to do so. Electric power from this project is not a necessity, it can be used and that is our principle for cooperation.

We can contribute to the financial and economic feasibility of the project by construction of transmission lines, marketing the power, and thus through power revenues assist the project.

But I wish to reemphasize that we need water, not power, we need water such as would be available through the central Utah and other participating projects.

Mr. PATTERSON. Senator, in order to save your time, I will file my comments. They deal principally with the fact that this is not an untried field for us, that we have been wheeling Bureau of Reclamation power over our transmission system in the State of Colorado REA's, so we have had a considerable amount of experience in this field.

I believe that you and I have gone over this thing, and I believe that our philosophy on the private utilities and the Government working

together is very similar, so that you are aware of what we have been doing.

If I might file this and have it incorporated into the record as though I had read it, that would save your time.

Senator WATKINS. That will be the order.

(The statement is as follows:)

STATEMENT BY PUBLIC SERVICE CO. OF COLORADO RE COLORADO RIVER STORAGE PROJECT

As stated before, my name is L. R. Patterson and my address is 900 15th Street, Denver, Colo. I am assistant vice president, electric operations, of the Public Service Co. of Colorado.

In my capacity as assistant vice president I am responsible for the future electric power supply and system planning of this company.

In this connection we must very carefully study the future power requirements of our service area and make plans as necessary to meet these requirements when they arise, and on an economically sound basis. We are very proud of our record of meeting these expanding power requirements of our area. We have more than doubled our generating capacity since the end of World War II; and by the end of 1955 we will have tripled our World War II capacity.

The other companies for whom we speak have had generally similar experiences. It is on the basis of this experience that we are able to make the proposal which Mr. Moffat has just submitted; namely, to utilize our existing transmission facilities and to construct such additional transmission facilities from the project powerplants or backbone transmission tie line as are necessary to market electric power from the Colorado River storage project throughout our respective service areas.

In making this proposal, these companies are offering to make a **very substantial investment** in transmission facilities. We estimate that in the earlier phases of the project the combined investment to be made by the private utilities will probably reach \$75 million, and for the ultimate development this investment in transmission facilities may reach \$125 million.

Referring again to Mr. Moffat's statement, the companies involved have offered two suggested methods of handling the power requirements of such customers as are entitled to preference under the law.

The first method mentioned is commonly known as wheeling. Under this plan the preference customer contracts directly with the Federal Government for the project power which the customer desires. The Government in turn contracts with the company whose transmission system is adjacent to the preference customer, to make delivery of or wheel the project power over the company's transmission system. The Government compensates the company for the use of its transmission facilities, and all charges to the preference customer are made in that case directly by the Federal Government.

The Public Service Co. of Colorado had had some 3 years of experience with wheeling. We wheel Colorado Big Thompson power to 6 preference customers at some 18 different points of delivery. One of these points of delivery is 150 miles distant from the location at which we receive the power from the Big Thompson system. Altogether these preference customers are spread out over a very wide

area so that the utilization of our transmission system is a very substantial saving in investment to the Federal Government. We believe that this method has been satisfactory to all parties concerned.

Now, the second means suggested might be called the resale method. Under this the company would purchase the project power from the Government, and the preference customer would contract directly with the company. The company would sell the power to the preference customer at rates which will pass on to the preference customer such savings as are obtained through the purchase of project power. The advantage to the preference customer under this method is that the company will offer open-end contracts which will assure the customer of future power supply without any commitment for a reservation charge.

Now, if this committee reports favorably on our proposal, the respective companies involved will base their future system planning on this premise and make all future transmission-line additions of such capacity as will best fit into this long-range plan. As a result, the companies will begin making substantially higher expenditures for transmission facilities than would be otherwise required.

If the Colorado River storage project is approved by your committee, and your committee believes our proposal merits favorable consideration in the implementation of the project, it is respectfully requested that your committee recognition to our proposal in its report, either by a specific recommendation thereon, or that the basic principles of our proposal be incorporated in the authorizing legislation. This we believe to be essential from the standpoint of the companies involved because of the very substantial financial undertaking on their part, which is encompassed in the proposal, and also because of the necessity for forthwith programing of future transmission construction to coordinate with the project development.

Senator WATKINS. I have a statement of the Delta-Montrose Rural Power Lines Association which will be made a part of the record at this point.

DELTA-MONTROSE RURAL POWER LINES ASSOCIATION,
Delta, Colo., June 10, 1954.

Hon. EUGENE D. MILLIKIN,
Senate Office Building, Washington, D. C.

DEAR SENATOR MILLIKIN: I have received information to the effect that the Subcommittee on Reclamation of the Senate Interior and Insular Affairs Committee will soon hold hearings on S. 1555 which is your bill relating to the upper Colorado River storage project.

It is going to be impossible for me to attend the hearings, but I would like very much to have a few statements inserted in the record of the hearings.

My name is F. M. Peterson. I am 45 years of age and have, except for short periods of time, spent my entire life in the State of Colorado. By profession I am now and have been, for the last 8 years, the superintendent of the Delta-Montrose Rural Power Lines Association, an AEA co-op with offices at Delta, Colo.

My parents owned and operated a farm near Hotchkiss, Colo., so I have spent most of my 45 years on a farm in Delta County, Colo. After the death of my parents I operated the farm and thereon learned to appreciate the use of irrigation water and to realize the damage caused by the lack of water. Many of the years have I had to helplessly stand by as my crops were ruined because of the lack of late season water, although every year the spring brought floods of water down our rivers. I learned by experience an abundance of water in May and June does not provide water in August and September without reservoirs to regulate the streamflows.

I am the director of the Delta County Water Advisory Committee. I represent the county of Delta on the Colorado River Water Conservation District

board and a member of the Western Colorado Water Association which is a committee representing all of western Colorado.

The State of Colorado supplies practically three-fourths of the water that makes up the Colorado River. And by compact agreement Colorado has been allocated over one-half of the total volume of water from the Colorado River allocated to the four upper basin States. I know by experience that without storage reservoirs it matters not how much water is allocated to us by compacts and agreements, we cannot make future use of any part of the allocation as our streams are overdecreed on direct flow. In other words, we cannot even obtain the water we are allowed under present decrees without storage reservoirs as the minimum flows will not provide the necessary water.

If our thousands of acres of fertile soil are to be irrigated and if our vast deposits of oil shale, coal, and uranium are to be processed for the benefit of mankind, we must have storage reservoirs.

In S. 1555 there is one project which is the keystone to the development of water resources in western Colorado and that project is the Curecanti on the Gunnison River. It will store approximately a million acre-feet of water. The percentage of evaporation is less on this proposed reservoir than on any reservoir proposed in the upper Colorado River storage project. Curecanti is located high up on the Gunnison River nearest to the Continental Divide where the waters of the Colorado River originate. This then, means that as the water stored in Curecanti is diverted downstream from the dam, it can be used over and over again, providing the most good to the greatest number of people. Both the water and the power developed from Curecanti can be used to a good advantage in developing and processing of natural resources vital to the safety and success of the United States.

We in western Colorado do not believe the Bureau of Reclamation has investigated all of the possibilities and benefits attributed to the proposed Curecanti project. We know that there are many irrigation, recreation, and flood-control benefits that would be realized if the Curecanti Dam were built. We also feel certain that additional electric-power development can be obtained by utilization of an additional 295 feet of head in the 9-mile stretch between the Curecanti Dam site and the high-water line of the proposed Crystal Reservoir. The utilization of this additional power head and the benefits to irrigation, flood control, and recreation make Curecanti a very desirable project and one that will be economically feasible.

We in Delta County are fully familiar with the necessity of the Paonia participating unit of the upper Colorado River storage project. The project has been authorized in part at two different times in the past. Construction has been completed on the canal to carry water to the farms. The question most often asked locally is, "What water will the canal carry?" Without a reservoir to supply water for the canal, the canal is of no material benefit. We therefore request that favorable action be given the Paonia project now before your committee.

Although I have only set forth a few of the benefits that would result in the authorization and subsequent construction of the Curecanti and Paonia units of the upper Colorado River storage project, we in western Colorado are very anxious to see all of the units, in Senate bill S. 1555, authorized, and we hope the committee will act favorably on this bill as the benefits will accrue to everyone in our great Nation.

Very truly yours,

F. M. PETERSON, *Superintendent.*

Mr. PATTERSON. Thank you, sir.

Senator WATKINS. Thank you, gentlemen. I think we have had all the witnesses now except the witnesses from California. Are they here?

Mr. Ely, would you please come forward.

STATEMENT OF NORTHCUTT ELY, SPECIAL COUNSEL, THE COLORADO RIVER BOARD OF CALIFORNIA

Senator WATKINS. May I inquire how long you will take, Mr. Ely?

Mr. ELY. My statement will take perhaps three-quarters of an hour to present; short of questions, that is.

I am accompanied by Mr. Raymond Matthew, the chief engineer of the Colorado River board. His statement will take about the same time.

I also have a statement to present for Mr. Morris, who is unable to be here, and that will take less time.

Senator WATKINS. The reason I am inquiring is because I must consider, unfortunately, a personal matter affecting me. The session lasted until 12 o'clock last night, and I did not get home until 1 o'clock so I could retire. I have had a long day.

If it is going to take that length of time, I think in the interest of everybody we should recess until tomorrow. Did you want to read it?

Mr. ELY. I will prefer to read it.

Senator WATKINS. It looks like we will have to go until tomorrow. I have taken just about everything that I can take today.

Mr. ELY. Whatever suits you, Mr. Chairman.

Senator KUCHEL. Could we run an hour, Mr. Chairman, and perhaps hear Mr. Ely?

Senator WATKINS. Well, I will do that.

Mr. ELY. Whatever suits you, Senator.

Senator WATKINS. You may proceed, Mr. Ely.

Mr. ELY. Mr. Chairman, my name is Northcutt Ely. I am an attorney, with offices in the Tower Building, Washington, D. C., and appear here as special counsel to the Colorado River Board of California, a branch of the State government.

California, as a party to the Colorado River compact, is affected by this bill in the respects which I shall outline. California is also a party to the pending suit in the Supreme Court entitled "*Arizona v. California et al.*, No. 10 Original, October Term, 1953," as are Nevada, Arizona, and the United States.

I have the honor to represent California in that action as an assistant attorney general, under the direction of Attorney General Edmund G. Brown, of California. Certain of the issues in that suit are directly involved in the assumptions made by the Bureau of Reclamation in planning the project now before you. These will be identified during the course of my statement.

I. The pending project:

The legislation now before the committee, as modified by the explanations given by the Interior Department, would accomplish four general objectives:

First: It would authorize in section 1, page 2, line 19, the construction of 15 reclamation projects—reduced to 11 as recommended to this committee by Under Secretary Tudor. The aggregate consumptive use of these 11 irrigation projects is said to be about 400,000 acre-feet. The evaporation loss on the storage reservoirs, referred to below, is another 600,000 to 700,000 acre-feet. These quantities, added to about 2,500,000 acre-feet, said to be required by projects already constructed or authorized, would represent a total of about 3,500,000 acre-feet in the upper basin.

This total is well within the quantity of 7,500,000 acre-feet per annum, the use of which is apportioned to the upper basin by article III (a) of the Colorado River compact.

Moreover, the engineering studies indicate that this total could be put permanently to use without the construction of any new holdover

storage whatever, and that no holdover storage would be required for about 50 years, even if other projects were added.

Second: The bill nevertheless authorizes, in section 1, page 2, line 12, the construction of 5 storage reservoirs: Echo Park, Flaming Gorge, Glen Canyon, Navaho, and Curecanti—reduced to 3, Glen Canyon, Echo Park, and Curecanti, in Under Secretary Tudor's statement here. The ultimate storage program amounts to over 48 million acre-feet, and these 3 dams account for about 33 million. The purpose of authorizing construction of these reservoirs now, instead of many years from now, is twofold:

(a) Electric energy would be generated and sold and the proceeds pooled to pay out the cost of the storage dams, and thereafter, starting 44 years from completion of Glen Canyon, to subsidize the construction of the power and reclamation projections previously referred to in section 1.

(b) And the proponents of the measure say, if built now the reservoirs could accumulate water with less interference with consumptive uses in both the lower and upper basins than if their construction were delayed until a later time when consumptive uses will be larger.

Third: The bill authorizes, in section 5, page 8, line 1, the construction of other projects, unnamed, provided they meet certain criteria. These are not designated in the bill, but the Department has inventoried over 100 projects in various publications, particularly House Document 419, 80th Congress.

It is not clear from section 5 whether these projects must be brought back to Congress for further authorization, or whether the Secretary is authorized by section 5 to build them.

The House bill, H. R. 4449, in section 1, page 17, line 2, provides that the Secretary need not submit his reports on these projects to the affected States for comment.

In any event, when they are built, the new power projects and the new reclamation projects covered in section 5, commencing some 45 to 50 or more years in the future, will share in the subsidies afforded by the sale of power to be generated at Glen Canyon; and, in addition, and for the first time, a fourth function of the great holdover storage reservoirs will then come into existence. Thus:

Fourth: When, as, and if the additional projects referred to in section 5 are built, it will be necessary to store water in these reservoirs, not for use by these projects—Glen Canyon Reservoir, for example, is so far downstream that no water stored there can ever be used for irrigation or domestic purposes in the upper basin—but for quite a different reason: to enable these section 5 projects to increase the consumptive use in the upper basin above the 3,500,000 acre-feet required by existing projects plus the section 1 projects, without violating the provisions of article III (d) of the Colorado River compact.

That article of the compact stipulates that the States of the upper division—Colorado, Utah, New Mexico, Wyoming—will not cause the flow of the river at Lees Ferry to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years.

In the driest decade so far, the flow at Lees Ferry was well over 100 million acre-feet, during a time when the upper basin projects were using about 2 million acre-feet per year; and engineers tell us

that the upper basin uses can rise to about 4,300,000 acre-feet, which is more than the total of existing uses plus the uses of all the section 1 projects, plus all the projects that the Interior Department testimony has eliminated, before this 100 million total would shrink to 75 million.

Thus the ultimate purpose of Glen Canyon Reservoir, and the other holdover storage reservoirs, is to enable the section 5 projects to be built in the upper basin without violating article III (d) of the compact, and the immediate reason for constructing Glen Canyon Dam now instead of waiting until the section 5 projects are built is (according to proponents of the measure) first, to start paying out the cost of the big reservoirs, then to subsidize the section 1 projects and, second, to fill Glen Canyon and other reservoirs during a time when the filling is easier, presumably, than it will be later on.

The bill, and the testimony here, make clear that this measure is intended to commit Congress to a program for the full utilization of all the water which the upper basin claims under the Colorado River compact. Otherwise, the storage reservoirs are not needed for any water conservation purpose, and are strictly power dams.

As all of the foregoing involves the Colorado River compact, and as California is a party to that compact, California is directly concerned by the interpretations of the compact implicit in the Interior Department's reports which this bill would effectuate, and in the interpretations of the compact which will control the administration of these reservoirs.

This is apparent when it is realized that the total storage capacity planned is enough to intercept the whole flow of the river for several years, and that it is planned to hold over storage in these reservoirs, for more than 20 years, or 5 presidential administrations, in order, for example, to deliver water to the lower basin under article III (d) in the year A. D. 2000 which, in fact, flows into the reservoir in 1980.

During the 50 years that these reservoirs will serve no function except to generate power, they will evaporate some 30 million acre-feet of water.

Some rather firm understandings as to the meaning of the compact are required, especially as the bill now makes no provision for enforcement of the compact by any State against the United States, which will accumulate and hold this water in its reservoirs and release it subject to the decision of a long succession of Secretaries of the Interior as to what the document means.

The meaning of the document is now in controversy in the Supreme Court, in respects which affect the measure now before you. To these issues I now turn.

II. Interpretations of the Colorado River compact involved in the upper storage project legislation and the pending litigation:

1. The method of measurement of consumptive use:

Article III (a) of the Colorado River compact, in a single sentence, apports 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 per annum, which it states shall include all water necessary for the supply of any rights which may now exist.

Manifestly this one sentence must have the same meaning in both the basins to which it refers.

Senator ANDERSON. Do I understand by that that you mean the upper basin has just as much right to 7,500,000 acre-feet as the lower basin has?

Mr. ELY. To 7,500,000 acre-feet, yes, sir.

But there is sharp controversy over the meaning of the term "beneficial consumptive use." The question is whether it means the quantity in fact used, measured at the place of use, or whether it means the effect of that use measured in terms of stream depletion at some point hundreds of miles downstream, in this case Lees Ferry.

The same question arises under the Mexican water treaty's so-called escape clause. This question of interpretation of the Colorado River compact and the Mexican water treaty is directly at issue in the present Supreme Court case. The quantity involved in this dispute, so far as the planning of the upper basin storage project is concerned, is 300,000 to 500,000 acre-feet, according to engineers' estimates.

The Reclamation Bureau assumes that the measurement is to be in terms of downstream depletion in the case of the upper basin project and the central Arizona project, but in terms of diversion minus return flow, measured at the place of use, with respect to California. The Boulder Canyon Project Act defines it in the latter terms, and the Mexican water treaty says (article I (j)):

"Consumptive use" means the use of water by evaporation, plant transpiration, or other manner whereby the water is consumed and does not return to its source of supply. In general it is measured by the amount of water diverted less the part thereof which returns to the stream.

That corresponds with California's allegation of the meaning of the term in *Arizona v. California* (answer to Arizona, par. 8). Arizona denies that this definition applies to her uses (reply, par. 8), and the Reclamation Bureau, in the project before you, assumes that it does not apply to the upper basin, although in section 2, page 4, line 21, the projects to be built under the bill are recognized as being subject to the terms of the Mexican Water Treaty.

Another problem arises if the depletion theory prevails. One of its postulates is that when water is stored in a reservoir the stream below is depleted, and therefore that the consumptive use takes place then and there, in the year when the water is put in storage, not when it is taken out and used.

On that premise, to what years is the 48 million acre-feet of hold-over storage, i. e., of stream depletion, to be charged? And in future operations, how is the storage of more than 7,500,000 acre-feet in any one year to be charged? Is the same principle, whatever it may be, applicable to the lower basin reservoirs?

Senator ANDERSON. How are they done now?

Mr. ELY. Our uses are charged on a per annum basis in the year in which the water is taken out and used, and not the year in which it is put in storage.

In further answer to your question of a moment ago, as to the right of each basin to the use of 7,500,000 acre-feet, Senator Anderson, I should have qualified it to say that I will come to the provisions of article III (d), which contains the 75-million-acre-foot provision, and will comment then, if I may, in answer to the questions you asked me earlier.

2. The meaning of "per annum" in article III.

Article III (a) : Does the apportionment of the use of 7,500,000 acre-feet "per annum" mean an average of that amount over a period of years, or a maximum in any one year? Manifestly, as in the interpretation of "consumptive use," the compact must be given the same interpretation in both basins.

The Reclamation Bureau, in submitting this upper basin storage project, makes the assumption that the apportionment means an average over an extended period, apparently 35 years or more. The effect of this theory is that the upper basin may use, say, 9 million acre-feet or more of water in 1 year, and consider it as apportioned under article III (a), if it uses, say, 6 million or less in some other year, to average 7,500,000 acre-feet.

California alleges in the pending lawsuit that the apportionment means a maximum, like a speed limit on a highway, not an average. If the speed limit says 50 miles per hour, that doesn't mean an average of 50.

We allege (answer to Arizona, par. 8) that the words "per annum" in the compact mean "each year," and not an average of uses over a period of years, whether they are our uses or anyone else's.

Senator ANDERSON. Why didn't they set it that the lower basin would get 7,500,000 acre-feet each year and if the maximum fell below that, well and good? The effect of what you are saying is that California's 7,500,000 feet per year is fixed, and definite, but that 7,500,000 feet for the upper basin States is a maximum, and that deficiencies in dry years must be theirs and not the lower basin's.

Mr. ELY. What I am saying is that identically the same rule must apply to both basins.

Senator ANDERSON. Yes, but because there is a difference of guaranties, they don't apply to both basins if you carry them out. Isn't that right?

Mr. ELY. I will come to the guaranty in a moment.

I am talking about III (a), which, in our opinion, has no relation to the guaranty in III (d).

Senator ANDERSON. You think not?

Mr. ELY. I think not.

Senator ANDERSON. Quite obviously, it has to, if you are guaranteeing 7,500,000 to the lower basin States, and the others must deliver 75 million in 10 years, and they may never use more than the 7 million and a half in their big years and must make up the deficits in the small years, then the treatment is not the same and the guaranty does make some difference; doesn't it?

Mr. ELY. May I postpone comment on that until I come to article III (d)? I will try to answer you then.

Senator ANDERSON. Yes.

Arizona admits that "per annum" means "each year," not "average," but says that the issue is not yet material in the lower basin (reply, par. 8). The effect, if California is right, is that if the upper basin should use in a given year any quantity in excess of 7,500,000 acre-feet, it is using that excess out of unapportioned surplus, in competition with the appropriations of unapportioned excess or surplus waters which may have been made in the lower basin, and subject to the Mexican Treaty burden, which, under article III (c) of the compact, is to be first supplied out of surplus.

The amount involved in this particular issue is very large, of the order of 1,250,000 acre-feet per year. That is, if the compact means what we think it means, the Reclamation Bureau is in error that much in its assumptions as to the quantity of water which the upper basin can lawfully claim under article III (a), and, by the same token, that much more water must be let down to satisfy the Mexican Water Treaty and prior appropriations of surplus in the lower basin.

The same problem arises in the lower basin, but there the Reclamation Bureau has assumed that the limitation imposed upon California's uses by the Boulder Canyon Project Act is a maximum, not an average; so also with its assumptions as to the deliveries to be made under the Mexican Water Treaty and the amounts to be delivered under its water contracts with Arizona, California, and Nevada.

Both assumptions cannot be correct.

This problem of whether the apportionment under article III (a) is of an annual amount, or of an average available over a 20- to 35-year period, has no relation at all to the guaranty in article III (d) that the States of the upper division will not deplete the flow at Lees Ferry below 75 million in each 10 years. That problem is discussed below, in connection with the Mexican Treaty burden.

3. "Rights which may now exist"—

Senator WATKINS. Excuse me, sir. At this moment, Senator Anderson will take over, and we will conclude with the other witnesses tomorrow morning.

I regret having to leave.

Senator ANDERSON. You may proceed.

Mr. ELY. Article III (a) : Does the statement in article III (a) that the apportionment of the use of 7,500,000 acre-feet per annum "shall include all water necessary for the supply of any rights which may now exist" include 2 categories of uses in dispute in *Arizona v. California*: (1) the uses on the lower basin tributaries, particularly those of Arizona on the Gila River, which she says are not to be charged against the lower basin's apportionment of III (a) water, and (2) Indian uses in both basins?

The significance of the Gila appears in connection with the upper basin's obligations under articles III (c) and III (d) of the compact, and that of the Indian uses in connection with article VII, and will be outlined when those articles are reached in numerical order.

4. The Mexican burden :

Articles III (c) and III (d) : Article III (c) provides that the Mexican burden, which is a minimum of 1,500,000 acre-feet per annum measured at the border (and more than that, measured at Lees Ferry), shall be borne first out of surplus, over amounts specified in articles III (a) and III (b) and, if that is insufficient, that the burden of the deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the States of the upper division shall deliver at Lees Ferry water to supply one-half of the deficiency, in addition to that provided in article III (d).

Article III (d) provides that the States of the upper division, that is, Colorado, Utah, Wyoming, and New Mexico, will not cause the flow of the Colorado River at Lees Ferry to be depleted below an aggregate of 75 million acre-feet for any period of 10 consecutive years.

The interpretation of these two clauses is at issue in *Arizona v. California* and is involved in the present bill. The Reclamation

Bureau apparently assumes in its presentation here that there will be available at Lees Ferry, after the section 5 projects are built, only about 75 million acre-feet every 10 years.

Arizona says (reply, pars. 8, 11) that all this 75 million is III (a) water, that is, that this figure is merely 10 times the quantity apportioned to the lower basin by article III (a) of the compact, and that all of the lower basin's III (a) uses can be made from the main stream.

California (answers to Arizona, pars. 8, 11) and Nevada (petition, par. XIV) deny this, and say that Arizona's uses on the Gila, and the uses of Nevada and Utah on the Virgin River, are "rights which may now exist," in the language of article III (a), hence chargeable to (and protected by) article III (a).

Arizona retorts that her uses on the Gila are covered by article III (b) of the compact, an article which says that, in addition to the apportionment in article III (a), the lower basin is given the right to increase its beneficial consumptive use by 1 million acre-feet per annum.

If Arizona is sustained by the court in this position, there is no water for Mexico in the 75 million acre-feet at Lees Ferry referred to in article III (d), and the upper basin, under article III (c), must, in addition, release water to supply one-half of any deficiency in meeting the Mexican burden.

When the Reclamation Bureau reported favorably on the central Arizona project, it was on the assumption that Arizona's interpretations were correct, without, however, indorsing them.

If California and Nevada are correct, a portion of the 75 million acre-feet at Lees Ferry referred to in III (d), equal to the total of the water supply available and used on the Gila, Virgin, and other tributaries under III (a), is excess or surplus water unapportioned by the compact, available in part for the service of the Mexican water treaty and in part for appropriation, contract and use in the lower basin.

We view the 75 million as a minimum of "wet water," unclassified and unrelated to article III (a), and to be met whether or not there remains available to the upper basin, after meeting that obligation, water to sustain a maximum use of 7,500,000 acre-feet per annum of water apportioned by article III (a).

Senator ANDERSON. Isn't that what I was saying a minute ago? That you view this as an obligation whether or not it means any water to the upper basin? If they had to cut off every irrigation project that has prior appropriation, you still think it has to be done to deliver to the lower basin, don't you?

Mr. ELY. The lower basin and Mexico; yes, sir.

Article III (d) takes precedence over III (a); yes, sir.

Senator ANDERSON. In other words, the rights of California to 75 million feet are superior to any of the allocation to the States of Colorado, New Mexico, and Utah?

Mr. ELY. No, sir.

A lot of the water apportioned by III (a) never passes Lees Ferry at all. It appears in the Gila River and other tributaries that enter below Lees Ferry.

Senator ANDERSON. How much is in the Gila?

Mr. ELY. By our reckoning, in excess of 2 million acre-feet, and on the Virgin River in Utah and Nevada, approximately 300,000, and

the Little Colorado, and other tributaries entering below Lees Ferry, perhaps another 300,000.

Senator ANDERSON. Out of the Little Colorado?

Mr. ELY. Yes, sir.

Senator ANDERSON. Have you seen the Little Colorado?

Mr. ELY. Yes.

Senator ANDERSON. How much was in it when you saw it? Was it absolutely dry?

Mr. ELY. It is a highly variable stream, obviously, but it is one of the resources of the lower basin, with whose use we are charged, Senator.

My point is that not all of the lower basin's 7½ million acre-feet per annum is found at Lees Ferry. That is Nevada's position, that is California's position. Arizona says to the contrary, that all of the lower basin's III (a) water is found at Lees Ferry.

If Arizona is right, the upper basin must deliver not only 75 million, but half of the Mexican deficiency. If we are right, the 75 million includes some water for Mexico.

Senator ANDERSON. In either event, the 75 million comes first before any water in the upper basin?

Mr. ELY. Yes, sir.

The upper division's guaranty under article III (d) comes ahead of the upper division's right under III (a) according to our view.

On the other hand, the Under Secretary of the Interior, in response to a question by a Senator in these hearings, appeared to agree that the compact means that if the upper basin lets down 75 million acre-feet in each 10-year period, it is entitled to keep and use what is left. This, in our view, illustrates the erroneous interpretations of the Colorado River compact built into the planning of the Colorado River storage project.

Senator ANDERSON. Are you raising that question to the Supreme Court? Will that question come squarely before the Supreme Court?

Mr. ELY. It will come before the Court, yes, sir. Not directed squarely to the position of the upper basin, as I have stated in answer to your question, but it is involved. The problem is what are the excess and surplus waters of the Colorado River system and what are the rights to appropriate them. That does involve the question of whether the waters above uses of 15 million of apportioned water are subject to appropriation.

Senator ANDERSON. This question of whether or not the compact means if the upper basin lets down 75 million acre-feet each 10-year period it fulfills its obligation is a very important question.

Mr. ELY. Very important, yes, sir.

Senator ANDERSON. Up to the next 75 million acre-feet, the upper Basin States surely do believe that it belongs to them, but no more is guaranteed because there is a provision for the distribution of surplus waters beyond that. But in recent years there certainly have been no surplus waters beyond that, and as far as we can tell from looking at charts now, there probably will never be.

Don't you think this is a very important thing to consider?

Mr. ELY. It is indeed, sir.

Senator ANDERSON. You don't think it will be settled by the current litigation?

Mr. ELY. We would like to have it settled. We hope it will be.

Senator ANDERSON. If California's position is right, then all of these other States that want water, might as well pack up and go home.

Mr. ELY. No, it develops to this, that in our view, to the degree that the upper basin or, for that matter, the lower basin, uses in any year water in excess of $7\frac{1}{2}$ million acre-feet, it is using water which is not reserved by article III (a) as apportioned water, reserved against the law of appropriation, but is using excess or surplus waters to which it can claim a right only by appropriation.

And consequently if in any year the upper Basin States use more than $7\frac{1}{2}$ million acre-feet, which is all that the compact reserved as against the law of competitive appropriation, it is competing for that water as against appropriations in the lower basin.

Senator ANDERSON. I hope you get it to the Supreme Court.

Mr. ELY. I hope you are right, Senator. We would like to get all of these questions disposed of.

Senator ANDERSON. I thought when we had the central Arizona hearing, it was a pretty general understanding that before the matter got to Court we would settle this question. I am shocked to know that we have not settled it, because that means we will not know where we are for another 20 years.

Mr. ELY. I agree with you. It may be that in order to settle all of the questions in the compact that the States—all of them—are necessary and indispensable parties.

Senator ANDERSON. The other way would be to pass the Colorado upper basin bill and let the State of California come in and tackle it. I think I like that better.

Mr. ELY. I think I differ with you as to the route to be followed. I may say after reading Judge Brientein's testimony I am rather convinced that the four upper basin States are necessary and indispensable parties to the present litigation and it is probably to the interest of the entire basin that the upper basin States be included and brought into this suit.

Senator ANDERSON. There is nothing about that in the central Arizona bill. I thought we should all be in the suit in the beginning, and I still think so, but that doesn't matter.

Mr. ELY. Litigation is not a happy method of settling any controversy, but, if it is needed, one lawsuit is better than a series.

5. Reservoir losses:

Nowhere in the compact is specific provision made for accounting for reservoir losses. Arizona says that they are all chargeable against the apportionments made under article III (a). Nevada says that they are all chargeable to surplus. California says that, basin versus basin, they are to be charged with other uses to the basin in which they occur, in the order in which they accrue, whether to III (a), III (b), or other surplus, and that none are chargeable against present perfected rights existing in the lower basin before storage was provided. The upper basin compact (art. IV) charges them against apportionments under article III (a) of the Colorado River compact.

6. The right to demand or withhold water:

Article III (e) of the Colorado River compact provides that the States of the upper division shall not withhold water, and the States of the lower division shall not require the delivery of water, which

cannot reasonably be applied to domestic and agricultural use. Glen Canyon Reservoir and certain other proposed upper basin main-stream reservoirs will be so located physically that no water stored therein can ever be applied to domestic or agricultural uses in the upper basin. All of the water stored in such reservoirs will be required for domestic and agricultural use in the lower basin and Mexico. The 1953 engineering report by Raymond A. Hill to the State of Colorado implies that, if Hoover Dam's reservoir, Lake Mead, is not filled on the day when the gates are closed at Glen Canyon, it may never fill again.

Who is to determine how rapidly storage in these upper basin reservoirs is to be built up, or, putting it another way, to what extent water which would otherwise flow into Lake Mead is to be intercepted and withheld? Who is to determine how rapidly and on what terms releases are to be made? Presumably the Secretary of the Interior. Since the United States cannot be sued without its consent, manifestly some controls are necessary here if the States, both upper and lower, are not to abdicate the administration of their compact to the United States.

Senator ANDERSON. Is this unusual?

What happened when the lower basin would appropriate it? Who decides when water would flow into Lake Mead? I presume it would be the Secretary of the Interior?

Mr. ELY. The inflow into Lake Mead at present is simply the natural flow of the stream.

Senator ANDERSON. Would not the natural flow still flow in the Grand Canyon, then?

Mr. ELY. Yes; at present, but that is the problem, Senator. It flows into Glen Canyon, and when the dam is built, would stop there.

Senator ANDERSON. Isn't it stopped in Lake Mead?

Mr. ELY. Lake Mead is in the lower basin.

Senator ANDERSON. Do you mean it is all right to have rules on stopping the water in the upper basin but no rules on stopping the water in the lower basins?

Mr. ELY. No; I am speaking of a potential conflict, through the Secretary's determination as to how much to let down from the upper basin to the lower, out of Glen Canyon. I would like to avoid those conflicts. If the Secretary of the Interior should decide, for example, that the compact means what some witnesses here have said it means, that if 75 million is let down, that is the end of the matter, and all else can be retained upstream—

Senator ANDERSON. What about that?

Mr. ELY. We would have a very difficult time getting into court to test that question. He is administering property of the United States, the dam, and I think it is likely that the United States would be a necessary party under the ruling in *Arizona v. California* (298 U. S.). Conversely, if the Secretary of the Interior decided that he didn't want to accumulate water as rapidly in Green Canyon as you would like to have him do, that the water ought to come down, I think the upper basin States would have great difficulty getting into court to test whether he was performing the compact or not, for the reason that the United States is a necessary party, and without the consent of Congress cannot be sued.

Senator KUCHEL. To that extent you disagree with the testimony of the Federal judge the other day?

Mr. ELY. Completely.

Senator ANDERSON. And with almost every lawyer who handled this.

Mr. ELY. No. The United States in *Arizona v. California* (298 U. S.) held that the United States was a necessary party in any suit in the lower basin involving Lake Mead.

Senator ANDERSON. Did they rule in that case with reference to the regulation of water where an officer was performing an administrative act, that he could not be brought into court without the consent of the United States Government?

Mr. ELY. It ruled that whatever was done was all subject to the rights of the United States.

Senator ANDERSON. This is a Cabinet officer, performing an administrative act, and it is your contention that nobody can question the performance without the consent of the United States?

Mr. ELY. I do not say it is an administrative act. If the Secretary of the Interior is managing Government property, that dam—

Senator ANDERSON. He is administering the compact between the States.

Mr. ELY. Yes; and if there is a conflict as to whether the compact requires him to let down 75 million or let down more, I would say that a suit to determine how the property of the United States should be administered is one that requires the presence of the United States in court.

Senator KUCHEL. In other words—

Mr. ELY. It is not a matter—

Senator ANDERSON. I think we differ completely as to whether the dam, the water in the dam, and everything connected with it would be the property of the United States. I would think the Secretary would be properly performing an administrative act. If I remember my own personal interest, I found one occasion at that time where a Cabinet officer can be brought into court.

Mr. ELY. The recent decisions with respect to the control of property of the United States, to my mind, confirm the intervals to be drawn from the decision in *Arizona v. California* (298 U. S.) that the United States would be a necessary party.

Senator KUCHEL. Let me make one more comment. If there were dispute on this point, and this constituted one of the questions for the committee to determine in its executive committee meetings on this bill, obviously, this would have to be cleared by an appropriate defense.

Mr. ELY. May I resume?

7. Appropriation of surplus:

Does the provision for a further apportionment, by unanimous consent after October 1, 1963, mean that no State may validly appropriate surplus until a new compact is made? California alleges, in the pending litigation, that any State, including the upper basin States, may appropriate surplus waters unapportioned by the compact, subject only to their being divested by a new compact to which such a State is party, or by court decree.

Senator ANDERSON. How about if they had not acquired them but put them to beneficial use?

Mr. ELY. The United States Supreme Court held in the *Hinderliter* case that a State may, by compact with another State, restrict the use of its own citizens even though they are valid under its laws.

To continue: That surplus waters are subject to appropriation has been the position maintained by representatives of some, at least, of the upper Basin States in previous hearings. Arizona and Nevada say that no State may acquire any right in surplus until a new compact is made. If they are sustained, then the upper basin can acquire no right in the waters it may use in any year in excess of 7,500,000 acre-feet. Actually, under the compact, the Boulder Canyon Project Act and the Mexican water treaty, all excess and surplus water of the Colorado River system has already been appropriated or obligated to uses in the lower basin and Mexico.

Senator ANDERSON. Does that mean that this provision for a further apportionment is void?

Mr. ELY. No; it is entirely permissive, Senator.

No State is required—

Senator ANDERSON. Would it require a unanimous consent among the States?

Mr. ELY. Yes, sir.

Senator ANDERSON. And since California wouldn't give it, it is a null provision?

Mr. ELY. It might be California or any other State. I can't imagine your State, for example, if you had appropriated and put to use certain waters, agreeing to give them up, any more than we would.

Senator ANDERSON. Certainly, when that provision was put in, it was understood that there would be another meeting, and if they figured out what would be done, the water would be divided again. You are not going to try to rewrite the history, are you?

Mr. ELY. No, quite the contrary. But the record is also clear that intervening appropriations would be valid although at the risk of a subsequent reapportionment.

Senator ANDERSON. If the subsequent reapportionment required the unanimous consent of California you know it could never be given in God's green earth.

Mr. ELY. And also if it is attempted to take from New Mexico water appropriated in New Mexico.

Senator ANDERSON. Does any State other than California contend that they all did not agree that in 1963 they would meet again to try to divide up the surplus?

Mr. ELY. What the ultimate position of the other States will be, I don't know. I have been asked at the witness table here at previous hearings whether I conceded the right of the upper basin States to appropriate surplus, and my answer was "Yes."

Senator ANDERSON. How could they appropriate surplus when they are not even starting to get any part of their 7,500,000. You would have to get up to that first, wouldn't you?

Mr. ELY. That is correct.

Senator ANDERSON. And, therefore, it is a foolish thing to talk about going beyond that.

Mr. ELY. My point is, Senator Anderson, that you are going beyond that, on the theory of the Reclamation Bureau's report underlying this bill, because if you use more than 7½ million in any 1 year,

you are using excess or surplus waters and establishing a right thereto by appropriation, not by apportionment.

Senator ANDERSON. Well, they would never put to actual use more than $7\frac{1}{2}$ million. They certainly would have a right to store in order to deliver in their compact.

Mr. ELY. There you put your finger on one of the points which disturbs us. We contend that our right in the lower basin to claim apportioned water, water reserved against competitive appropriation, is a right to use up to $7\frac{1}{2}$ million acre-feet in any 1 year, not an average of that quantity over a period of years. We can't claim in the lower basin 9 million of apportioned water in 1 year, because in some other year we used only 6 million. If we use only 6 million in 1 year, that is too bad. If we use 9 million in some other, then a million and a half of that is excess or surplus waters which we are using at our own risk, acquiring the right by appropriation.

Senator ANDERSON. Let me see if I get that straight.

Mr. ELY. We say the same rule applies exactly in the upper basin. If you use 9 million acre-feet in some year, you are using a million and a half of excess or surplus waters; you are not using $9\frac{1}{2}$ million acre-feet of apportioned waters simply because in some other year you happened to use less than $7\frac{1}{2}$ million.

Senator ANDERSON. Let's see if I can say it another way. If for 10 straight years the upper basin States deliver $7\frac{1}{2}$ million acre-feet of water to you without fail every year, and in 1 of those years they use, say, 6 million acre-feet of water and the next year they use 6 million acre-feet of water but they have a very heavy runoff, and they store another 3 million acre-feet, you contend that that extra million and a half acre-feet, then, is a use of a surplus water to which they are not entitled.

Mr. ELY. No. There we fall apart on two differences, Senator Anderson. First, the 75-million-acre-feet guaranty at Lees Ferry in our mind has no relation whatever to article III (a) in either basin. It includes some III (a) water for the lower basin, it may include III (b) water, it includes water for Mexico, it may include some other surplus. It is so much wet water. It is a floor. It has nothing to do with the apportionment. The lower basin is charged in each of those years with the waters it uses on the Gila River, for example, and whether you measure the Gila at 1 million, 2 million, or some other figure, that is III (a) water, and so also are the old uses on the Virgin River. Consequently, the 75 million referred to in III (d) is just so much wet water, that includes a part of the Mexican burden.

That has nothing to do with how the upper basin uses are to be charged under article III (a). We say, as to article III (a): Charge the uses in the upper basin and in the lower basin exactly alike. Whatever rule you decide on for one applies to the other.

The rule already decided on for the lower basin, by statute, spelled out in the Boulder Canyon Project Act, is the aggregate annual consumptive use. If we use more than $7\frac{1}{2}$ million in the lower basin, that excess is excess or surplus. We say that rule applies in the upper basin.

Senator ANDERSON. You recognize no difference between the two areas, one supplying water and the other receiving it, and if they supply you with 75 million they probably figure they are fulfilling their contract with you.

And if they store in periods of good runoff in order to make water available to you, you think that would be wrong?

Mr. ELY. That is not the problem. There is no relation between III (a) and III (d) in that sense. The water delivered to us under article III (d), the 75 million acre-feet, is not identical with the III (a) water. But the point you raise illustrates the gravity of the problem of interpretation that I am trying to put before you. I am, of course, arguing my side.

Senator ANDERSON. I think what you are trying to say is that no matter how badly the upper basin needs this water, there ought to be some way of interpreting compacts so they can't get it.

Mr. ELY. Not at all. We want to have the compact interpreted so you operate under exactly the same ground rules we do.

Senator ANDERSON. But you don't have the ground rules when you are upper State.

Mr. ELY. We think the interpretation of the compact should be the same in both basins.

Senator ANDERSON. You can turn the world upside down and start pouring a little water in our direction, and we will show you that it doesn't work very well.

Go ahead.

Mr. ELY. Thank you.

8. The impounding of water for power generation:

Article IV (b) of the Colorado River compact authorizes the impounding and use of water for generation of power, but stipulates that—

such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

As elsewhere noted, no water stored in Glen Canyon Dam and certain other main stream reservoirs can ever be used, physically, for agricultural or domestic purposes in the upper basin. Such water is the residue after the uses in the upper basin. It will be stored and used at such reservoirs to generate power to be sold to subsidize irrigation and power projects in the upper basin. The use of these reservoirs appears to be squarely controlled by articles IV (b) and III (e), previously referred to. The right of the Reclamation Bureau to so manipulate them as to maintain power generation, if the waters stored therein are in fact needed for agricultural and domestic use in the lower basin, is subject to challenge.

Senator ANDERSON. That is the first place I have agreed with you for a long time.

Mr. ELY. Thank you, sir.

The sole function of Glen Canyon Reservoir is as part of a hydroelectric project, unless and until the section 5 projects are built, and for a period of 50 years or more even if they are built. Only thereafter does it assume any function under article III (d) of the compact.

As elsewhere pointed out, during this 50-year period, when the sole function of the reservoir is to generate power, they will evaporate over 30 million acre-feet of water, at the cost of power generation and agricultural use in the lower basin. The notion that Glen Canyon is to be built to accommodate the lower basin, and that the lower basin should bear the evaporation losses there, is a little farfetched.

Senator ANDERSON. You say "as elsewhere pointed out, during this 50-year period when the sole function of the reservoir is to generate power." Can you imagine a stretch of 50 years when the sole function will be to generate power?

Mr. ELY. That appears to be the case, Senator, from a Reclamation Bureau study. They concede that for 25 years these dams would not be necessary for any conceivable development in the upper basin. They stop at that point. Our engineers say most likely the period is 50 years, even if all of the projects contemplated in both section 1 and section 5 were built. That is to say that without any regulation at all, the upper basin could deliver 75 million acre-feet every 10 years and retain something like 4,300,000 acre-feet for itself, without Glen Canyon or Echo at all.

Senator ANDERSON. And retain how much for itself?

Mr. ELY. Retain approximately 4,300,000. Beyond that point you need storage of the type contemplated here. The Reclamation Bureau's program of development apparently indicates it is about 25 to 50 years off before anyone would have to build Glen Canyon to perform the obligation of III (d).

Senator ANDERSON. But from the flow of the river, it doesn't look to be 50 years off, does it? That is, if you look at the flow for the last 15 or 20 years.

Mr. ELY. I am speaking of the hydrograph over the last thirty-odd years. If that were repeated again, you still could use 4,300,000 acre-feet, the engineers say, without holdover at all. That is more than existing uses plus all projects referred to in this bill. On these engineering questions, I am a layman and Mr. Matthew will follow me with the figures.

Senator ANDERSON. Along the line of Hoover Dam being useful for 200 years, would that be of any benefit to the lower basin?

Mr. ELY. I think unquestionably.

Senator ANDERSON. If it did prolong the life for Hoover Dam of 200 years, then would the opinions be different?

Mr. ELY. A benefit starting 200 years in the future, Senator, is a little hard to evaluate.

Senator ANDERSON. That is exactly the way I feel about your 50 years.

Mr. ELY. 9. Indian rights:

Article VII of the Colorado River compact provides that nothing in the compact shall be construed as affecting the obligations of the United States to Indian tribes. The upper basin compact provides that use by the United States or its wards shall be charged as a use by the State in which the use is made. California, in the pending suit, takes the same position. The United States denies this and says that—the rights to use the water of the Indians and Indian tribes are in no way subject to or affected by the Colorado River compact.

The Government's petition tabulates 1,747,250 acre-feet of "diversion" claims of Indians in the lower basin of which 1,556,250 are in Arizona.

There are large Indian claims in the upper basin, but they have not been tabulated so far in this suit. Arizona says that—

the obligations of the United States to the Indians or Indian tribes are not material or relevant.

It is known that the Office of Indian Affairs construes article VII of the compact as meaning that (1) the Indian claims come ahead of the compact, are not chargeable to any State, and the compacting States simply divided the residue after the Indian claims; (2) Indian claims relate back to the date of establishment of the reservation, even though not put to use, and take priority over uses by non-Indians even though the uses by non-Indians may in fact long antedate the actual putting of water to use by the Indians.

The Government's pleadings leave it free to make both these assertions. As to the first, Arizona has refused, so far, to disagree with the Indian Bureau's position. Naturally, if Arizona can hope for 1,500,000 acre-feet for Indian diversions, outside the compact, in addition to the 3,800,000 acre-feet she demands under the compact, there is a temptation to try to get it. Just where the water would come from is not very clear. Arizona, at a meeting with the Attorney General of the United States on December 3, 1953, was invited to join the upper Basin States, California and Nevada, in a common statement of position that Indian uses are to be charged under the compact against the State in which they are situated, but declined to do so.

Senator ANDERSON. You would recognize that the State of New Mexico has agreed that the Navaho use, nearly all of our use, is properly chargeable against the State of New Mexico.

Mr. ELY. Yes; I think you are correct. Our uses of Indians in California, which are not large, are charged against our State and required to be so charged under the regulations of the Secretary of the Interior. The existence of the Indian claims, and uncertainty as to their accounting, raises serious questions as to the water supply for the projects in both the upper and lower basins. The United States, in this suit, also claims independent rights for the use of the Bureau of Land Management, the Forest Service, the Park Service, for fish and wildlife, et cetera, and denies that all of its rights are subject to the Colorado River compact. The magnitude of these additional claims is not stated. Those questions will not be resolved until this suit is decided.

10. Present perfected rights:

Article VIII provides that—

present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact.

In the present suit California alleges that "unimpaired" as used in this article means unimpaired as to both the quantity and the quality of the waters to which these perfected rights relate. California alleges that as of the effective date of the compact, her present perfected rights were not less than 4,950,000 acre-feet.

Senator ANDERSON. What was the figure in the so-called Self-Limitation Act?

Mr. ELY. 4,400,000 acre-feet of the waters apportioned by article III (a), plus not to exceed one-half of the excess of surplus waters unapportioned by the Colorado River compact.

The report of the Reclamation Bureau contains no data on the effect of large transmountain diversions coupled with other upper basin uses on the quality of water. Such a study should obviously be made. We know that when the compact was ratified, the Colorado Commissioner's formal report stated that—

natural limitations upon the use of the waters within each of the upper States will always afford ample assurance against undue encroachment upon the flow of Lees Ferry by any one of the four upper States. Colorado cannot divert 5 percent of its portion of the river flow to regions outside the river basin.

Elsewhere he testified that Colorado's transmountain diversions could not exceed 300,000 acre-feet per annum. By contrast, the Colorado transmountain diversion projects inventoried in the Reclamation Bureau's various reports aggregate 2 million acre-feet, or 52 percent of the water allocated to Colorado by the upper basin compact. There would be that much less water to absorb an increasing quantity of salts in passage to Lees Ferry. The effect on the lower basin is one which the lower basin States are entitled to have studied and reported upon, to the end that their present perfected rights, in the language of article VIII, shall remain unimpaired.

Senator ANDERSON. Did you feel that the discussion we had on that, in which we thought it would be interesting to have a study of this question of salinity on other projects was sufficiently broad compared to what you had in mind?

Mr. ELY. I don't think I heard all of that discussion.

Senator ANDERSON. It wasn't completely settled, but I think most of us agreed that it would be desirable to find out what the actual facts were.

Mr. ELY. The suggestion has been made that that study should go throughout the entire basin. I have no objection to that. We just want to know the facts.

III. CONCLUSION

California's basic position is that our State is conforming to the Colorado River compact, the Boulder Canyon Project Act, and the other enactments which comprise the law of the river, and we must insist that the Reclamation Bureau and the upper basin States do likewise in the planning and administration of the Colorado River storage project. The Colorado River storage project, as now planned, is based upon interpretations of the compact which, in our view, are wrong and constitute encroachments upon the compact for the benefit of the upper basin to the extent of about 1,500,000 acre-feet per year. The fact that the initial stages of this project will not use all the water claimed by the upper basin is not important. Thirty-three to forty-eight million acre-feet of storage is to be built now only on the premise that all the water claimed will be ultimately used, and the bill proclaims that it will be so used.

Because the legislation before you encroaches upon the Colorado River compact and upon California's water supply, the Colorado River Board of California has adopted the following resolution, which summarizes our position:

The Colorado River Board of California opposes the enactment of S. 1555 and H. R. 4449, 83d Congress, bills to authorize the Secretary of the Interior to construct, operate, and maintain initial units of the Colorado River storage project and participating projects, and for other purposes.

California favors the continuation of the development of the water resources of the Colorado River Basin on a sound economic basis, as the need for such development occurs. This State recognizes the right of the upper basin States to so utilize the waters apportioned to that basin by the Colorado River compact as approved by the Boulder Canyon Project Act, but subject to the terms and

conditions of those documents as the Supreme Court may construe them in the case of *Arizona v. California*, now pending.

By the same token, California, in the protection of its investment of nearly \$700 million in water-development projects which it has made in reliance upon the Colorado River compact and the Boulder Canyon Project Act, and the economy and population of more than 4 million people dependent upon these works, must resist legislation which would encroach upon the rights recognized in the lower basin States by those documents.

The proposed Colorado River storage project legislation adversely affects the lower basin States in much the same way as would the proposed central Arizona project legislation. Both are based upon interpretations of the Colorado River compact and the Boulder Canyon Project Act, with which California cannot agree and which are now at issue in the United States Supreme Court.

Each of them contemplates developments which would encroach upon the compact and project act, as interpreted at the time of enactment of those laws, to the extent of more than a million acre-feet per year. Both proposals are based upon unrealistic water-supply estimates. Each is in conflict with the presentation made to the Senate by the supporters of the Mexican Water Treaty. Each ignores the legal claims which are in conflict with it, and both ignore the damage which their construction would cause to the investments already made by their neighbors. Each of these proposals is dependent upon Federal subsidies for irrigation amounting to many times the value of the land when fully developed, and most of these subsidies are concealed. Both would commit the Congress to new feasibility standards and pay-out formulas with which this board and other California State agencies have officially expressed disapproval.

Senator ANDERSON. Do you think that is a valid objection to a project of this nature, where one State can get off by itself and say, "We don't approve of the basinwide pool, and, therefore, it is improper for the Federal Government to have that type of legislation"?

Mr. ELY. Aside from the right of any State to express its views, and I suppose we all have a right to do that, in this case our particular objection is that by the aid of these particular subsidies, the overdraft of the water is increased.

The Colorado River storage project would intercept the lower basin's water supply with giant reservoirs at Glen Canyon, Echo Park, and Curecanti, capable of storing several years' flow of the river. In the absence of statutory controls of the operation of such reservoirs designed to protect the output of firm power at Hoover Dam, upon which the United States and the power contractors relied, the use of such large storage could result in seriously curtailing the revenues at Hoover Dam and other dams on the lower river and upon which these lower projects depend for financing. It is against the best interest of both the power users in the lower basin and the Federal Treasury to so legislate.

Both Glen Canyon and Echo Park Reservoirs would be located downstream from any point of use by the proposed irrigation projects in the upper basin and their major purpose would be to provide revenues, commencing almost 50 years hence, to pay the capital cost without interest of the irrigation projects proposed for construction now. This postponement of nearly 50 years of the commencement of repayment of irrigation would result in a Federal subsidy amounting to over \$2,500 per acre of irrigated land—an unwarranted and unjustified burden on the Nation's taxpayers.

California, as a major taxpaying State, is doubly affected, for the amount of the overdraft on the water supply of the Colorado River Basin is directly related to the amount of Federal subsidy to the irrigation projects creating the overdraft.

The bills delegate to the Secretary of the Interior power to resolve the feasibility of the participating irrigation projects. If reclamation

feasibility standards are to be changed, that should be done by Congress, in general legislation after the Hoover Commission has had an opportunity to report upon this very matter, heretofore committed to their study.

The proposed legislation includes some, and foreshadows others, large transmountain diversion projects in the upper basin using several million acre-feet of water annually, thereby impairing the quality as well as the quantity of the water available to the lower basin and to which the lower basin is entitled under the Colorado River compact.

For all these reasons, the Colorado River Board of California respectfully requests the representatives of this State in the Senate and House of Representatives of the United States to oppose the enactment of legislation to authorize construction of the Colorado River storage project and participating projects as proposed in these bills—S. 1555 and H. R. 4449—or similar legislation, and instructs its officers and staff to make the appropriate presentation of the views of this board to the congressional committees and executive agencies concerned with such legislation.

Mr. Chairman, may I ask permission to have printed as a part of my statement (1) the document which comprises the views of the State of California on the proposed Colorado River storage project which was submitted under the provisions of the Flood Control Act of 1944, and (2) a document which is a summary of the controversy in *Arizona v. California et al.*, comprising a portion of our pleadings in that case.

Senator ANDERSON. That will be made a part of the record.

Mr. ELY. And a number of resolutions by California cities and districts, and others, in opposition to this legislation.

Senator ANDERSON. They will be received.

(The documents referred to appear at the end of Mr. Ely's testimony.)

Senator ANDERSON. Senator Kuchel.

Senator KUCHEL. Mr. Chairman, the record so far in the Senate subcommittee apparently lacks some important information about what is involved in irrigation costs. May I, therefore, Mr. Chairman, request that this committee request the Bureau of Reclamation to file for inclusion into the record the following information:

(a) For each participating project included in the bill the average cost per acre, regardless of who pays the cost, for land which would be newly irrigated, for land to be supplied with supplemental water, for the total of the two kinds of lands—

Senator ANDERSON. Do you mean that? The first part is all right, where you say the total for the two kinds of lands per acre. I do not know how can you add new land and supplemental water on the same piece of land.

Senator KUCHEL. For land to be newly irrigated and lands to be supplied with supplemental water.

Senator ANDERSON. When you figure your per-acre cost, you can't figure the per-acre cost of new land and the per-acre cost of supplemental water on land that is not new and say that both go to the same acre, because they cannot be new and supplemental at the same time.

Mr. ELY. I think it would be useful to have the statistics on each type.

Senator ANDERSON. I don't object to that. He said the total of the per-acre cost of new and supplemental water, and they cannot be new and supplemental on the same piece of ground.

Mr. ELY. I think if that were shown for each class it would be the statistics required.

Senator KUCHEL. May that request be made, Mr. Chairman?

Senator ANDERSON. Yes; for each. I am not trying to be critical; I am just saying that it is impossible the other way.

Senator KUCHEL. Mr. Chairman, I would on that point like, with your assistance, to acquaint the representatives of the Bureau of Reclamation with just what is desired.

Senator ANDERSON. Let it be understood that Senator Kuchel will discuss it with Mr. Larson; and if it is possible to furnish the figures he has requested, even though I think they would be difficult to furnish, they will be furnished.

(The following was subsequently received for the record:)

Estimated cost allocated to irrigation projected on an average acre basis for project total, supplemental, and new lands

Participating project	Project area (acres)		Total	Irrigation allocation total
	New	Supplemental		
Central Utah	28,540	131,840	160,380	\$127,354,000
Emery County	3,630	20,450	24,080	9,636,500
Florida	6,300	12,650	18,950	6,503,600
Hammond	3,670		3,670	2,302,000
LaBerge	7,970		7,970	1,673,300
Lyman		40,600	40,600	10,564,000
Navaho ¹	151,000		151,000	232,650,000
Paonia	2,210	14,830	17,040	6,791,600
Pine River extension	15,150		15,150	5,027,000
Seedskadee	60,720		60,720	23,272,000
Silt	1,900	5,400	7,300	3,282,400
Smith Fork	2,270	8,160	10,430	3,343,000

Participating project	Average project cost per acre	Average new land cost per acre	Average supplemental land cost per acre
Central Utah	\$794	\$1,874	\$560
Emery County	400	1,115	273
Florida	343	671	180
Hammond	627	627	(²)
LaBerge	210	210	(²)
Lyman	260	(²)	260
Navaho ¹	1,540	1,540	(²)
Paonia	398	1,229	275
Pine River extension	332	332	(²)
Seedskadee	383	383	(²)
Silt	450	950	272
Smith Fork	321	854	174

¹ Navaho not included in the Department's recommendation in report on the bill.

² All new land.

³ All supplemental land.

Senator KUCHEL. Now, Mr. Chairman, just 1 or 2 questions.

Can you inform the committee, Mr. Ely, of the status of the lawsuit in the Supreme Court? When might a decision be anticipated?

Mr. ELY. The status of the case is this: Arizona filed a bill of complaint against California and the water using agencies in California. She did not join the United States and did not join any other State as defendants. The State of California answered. The United States intervened. The State of Nevada was allowed permission by the court to intervene and is now a party. Arizona has not answered Nevada. Nevada has not answered the United States. A master has been appointed by the court and the case referred to the master. The procedure from now on is in the hands of the master.

How the master will set the case up or how long it will take him to try it and render his report and thereafter for argument to be heard upon it, and an opinion of the court to be handed down is a matter of conjecture.

One of the problems involved, I may say, is as to just what parties are necessary to the determination of this controversy. The State of Nevada has raised the point that Utah and New Mexico are indispensable parties, as being in part within the lower basin. We think Nevada is right about that. From Judge Breitenstein's testimony I draw the conclusion that all four States may very well be indispensable parties. His views and ours as to the interpretation of this document are obviously poles apart. It may consequently be necessary to implead all four of them.

Senator KUCHEL. You are just in the preliminary stages so it would be futile, even, to try to estimate when a decision would be reached?

Mr. ELY. That is correct, sir.

Senator ANDERSON. I think, Mr. Ely, that in the central Arizona hearing, unless my memory is playing me a trick, I was one of those that kept insisting that all of the States had to come in. I desire that.

Mr. ELY. I think that is correct, Senator Anderson.

Senator ANDERSON. I certainly subscribe to that point of view. We might as well all get into court anyway.

Mr. ELY. We do not want a protracted lawsuit and then end up with a decree that we find does not settle the questions, and that sometime in the distant future there is to be another lawsuit involving the upper basin. Let's get it all settled at one time.

Senator KUCHEL. Basically is it the position of the attorney general of California and the Colorado River Board of California that this legislation would violate the rights of California under the Colorado River compact?

Mr. ELY. That is the opinion and view of the Colorado River Board of California and of the State as expressed through the department of public works, which is delegated by the Governor as the responsible agency to render the State's reports under the procedure of the Flood Control Act of 1944.

Attorney General Brown has direction of the lawsuit; and so far as possible, the legislation and the lawsuit have been kept in separate compartments. We have not desired to have the problems of the legislation affect the lawsuit or vice versa, any more than we can help. They converge here in my testimony, as I represent the State's department of justice in our supreme court and represent another branch of the State, the Colorado River Board, with respect to this legislation.

Senator KUCHEL. And it is also the position of the State government that there is no present avenue by which the people of our State could bring into court and have a judicial decision rendered on the alleged violations of the Colorado River project?

Mr. ELY. If this bill should be enacted, without provision for some way to get into court to test the questions I have mentioned, our view is that without an act of Congress granting the consent to join the United States, it is highly doubtful whether any of the seven States could get the matter before the court as to the proper operation of these giant reservoirs.

Senator ANDERSON. I noticed in the House hearings you submitted some amendments.

Mr. ELY. We did, Senator Anderson. I am not submitting them here because of the fact that the bill seems to have taken a considerably different course. It is a little difficult to see just what final form it will have. I don't think any useful service would be performed by my submitting amendments at this stage.

Senator ANDERSON. In the House hearings, you expressed your disapproval of transmountain diversions. When the Colorado-Big Thompson project was constructed, did California object to that in any way?

Mr. ELY. No.

Senator ANDERSON. Has California objected to any of the other transmountain diversions until the State of New Mexico wanted to have a little tiny one?

Mr. ELY. No, Senator. We have, with growing concern, watched the mounting list of transmountain diversions.

Senator ANDERSON. As long as you had a big State like Colorado doing it, you never raised a voice; did you?

Mr. ELY. That is not it. I think that we have taken on the big powerful State of Colorado in connection with the Fryingpan-Arkansas project. It was the first time in which we have seriously raised this question of the effect of transmountain diversions.

Senator ANDERSON. I went through the Fryingpan hearings in the Senate. Did you testify?

Mr. ELY. Yes, sir. I am not sure you were there that day, Senator.

Senator ANDERSON. I may have missed that day. Therefore, you are strongly opposed to the transmountain diversion in Colorado as you are to the one in New Mexico?

Mr. ELY. Yes. There is no distinction between one of the upper States and the others, Senator. We have been reluctant to object to any upper-basin State projects until we felt that this bill presented us with the necessity, whether we like it or not, of raising the issues I have now raised. I would like this opportunity to place in the record a memorandum that summarizes the bills for development in the upper basin and the lower basin that have gone through in the last several years with California's acquiescence. It is frequently said by uninformed people that California's position is to oppose development through the basin; that is not true.

Senator ANDERSON. I say that you pick out your opponents that only have two Congressmen and not very strong representation. We feel kind of sorry that you picked out on us.

Mr. ELY. If we were looking for easy opponents, I think the State of New Mexico would be the last that we would pick, so long as it is represented in the Senate with the representation it has, to say nothing of its representation in the House. I would go a long way to avoid a row with you, Senator.

Senator ANDERSON. I recognize it is a very difficult thing for a State to watch a trend and finally some day speak about it.

Mr. ELY. That is our feeling; yes.

Senator ANDERSON. Revert for us a minute to the House bill, because it will have to be before us some time, either as a document we will consider on the floor or as a matter that might go to conference.

Mr. ELY. Might I interrupt to ask if this could go into the record; this memorandum?

Senator ANDERSON. Yes. That could go into the record at this point.

(The data referred to follow:)

MEMORANDUM—CALIFORNIA AND UPPER BASIN PROJECTS

An idea has been implanted in the minds of some Members of Congress from the States in the upper basin of the Colorado River to the general effect that California has consistently obstructed or opposed the approval of reclamation projects in the upper basin.

California has not only failed to oppose upper basin development; it has in repeated instances supported such development. That fact can be demonstrated.

I. Boulder Project Adjustment Act (54 Stat. 744): In the year 1940 the Boulder Project Adjustment Act was adopted by Congress with the active support of California, and its delegation in both Houses. That act provides that for 15 years there shall be paid out for investigation and construction of projects located exclusively in the upper basin States (Colorado, New Mexico, Utah, and Wyoming) the sum of \$500,000 per year, a total of \$7,500,000. Further, for the next 35 years a like sum each year shall be equitably distributed for the same purposes among the 7 States of the Colorado River Basin. From this it will follow that at least another \$8 or \$9 million will fall to the share of the upper basin States. This money is being derived and will be derived from the rates paid for power produced at Hoover Dam. More than 90 percent of the money is being taken from the pockets of the household and commercial power users in California.

These provisions of the act were not only agreed to by California but vigorously supported in Congress by the California delegation. They confer a special benefit upon the upper basin States, which have these funds available in addition to their fair share of the funds appropriated to the Bureau of Reclamation in general for general investigation of projects throughout the West.

II. Furthermore, in each of the following named projects, the California representatives on the congressional committees voted for the projects and either supported and voted for them on the floor or permitted them to be adopted without objection by unanimous consent. In no case did California oppose any of these projects. The record so shows.

1. Provo (Deer Creek) project, Utah (62 Stat. 92).
2. Mancos project, Colorado (61 Stat. 176). (In this instance, the Colorado River Board of California affirmatively supported reauthorization of the project before congressional committees and with the California delegation.)
3. Paonia project, Colorado (61 Stat. 181). (In this instance California took the same affirmative position as in the case of the Mancos project.)
4. Eden project, Wyoming (Public Law 132, 81st Cong.).
5. Weber Basin project, Utah (Public Law 273, 81st Cong.).
6. Fort Sumner project, New Mexico (Public Law 192, 81st Cong.).
7. Vermejo project, New Mexico (H. R. 3788, 81st Cong.).
8. Big Thompson project, Colorado (H. R. 5134, 81st Cong.).

III. Upper Basin Compact Act (Public Law 37, 81st Cong.): California officially joined with representatives of other States in commending the efforts of the upper basin States to come to an agreement upon an upper basin compact and repeatedly expressed the hope that they would be able to harmonize their views and make such a compact. When the compact had been made and ratified by the legislatures of the upper basin States, it came here for the consent of the Congress. The bill sets up certain criteria for the measurement and administration of the waters of the upper basin States which are distinctly different from those which are applicable to all seven Colorado Basin States under the original Colorado River compact of 1922. In the hearings which were held on the upper basin compact bill before the House Committee on Public Lands representatives of California appeared and testified on one point only. They stated that California had no interest whatever in how the upper basin States proposed to handle their affairs among themselves, but they asked that it be made crystal clear that the action of Congress should not be taken so as to interpret or vary the terms of the original Colorado River Basin compact. It developed then that the official representatives of the upper basin States disclaimed having any such idea, and language was agreed upon between California and the upper basin States which appeared in the House committee report, and properly preserves all questions of interpretation of the Colorado River com-

pact. This being settled, California approved the passage of the bill and it was passed on the Consent Calendar in both Houses.

Certainly no fair-minded person would consider that there was anything in the nature of obstruction or opposition on the part of California in these proceedings. The suggestion made by California was promptly and frankly accepted and agreed to by the upper basin States as being in proper order. The bill was not delayed nor was it jeopardized nor lost.

Senator ANDERSON. Can you show us where in the House bill as it was reported, the bill authorizes anything except the projects and units that are specifically listed?

Mr. ELY. Section 2 of the House bill, H. R. 4449, corresponds in general to section 5 of the Senate bill. It appears at page 17 of the House bill.

Senator ANDERSON. No; I am saying as reported.

Mr. ELY. This is as reported, sir.

Do you have it before you?

Senator ANDERSON. Yes; I do have it.

Mr. ELY. It reads:

In order to achieve such comprehensive development as will assure the consumptive use in the State of the upper Colorado River Basin of waters of the Colorado River system, the use of which is apportioned to the upper Colorado River Basin by the Colorado River compact, and to each State thereof, by the upper Colorado River Basin compact, it is the intent of the Congress in the future to authorize the construction, operation, and maintenance of further units of the Colorado River storage project, of additional phases of participating projects, authorized in this act, and of new participating projects as additional information becomes available and additional needs are indicated.

Thereafter, follow two criteria. There is also in the bill a provision—

Senator ANDERSON. Yes; but that does not authorize it.

Mr. ELY. It is a declaration of intent.

Senator ANDERSON. That is right. I can say that at some future time I intend to pay a certain amount of money to my bank, but unless I come forward with the money, the bank is never going to mark my note paid.

Mr. ELY. My point is there is no need for spending several hundred million dollars for Glen Canyon and Echo Park unless the section 2 projects are going to be built. The section 1 projects require only a half million feet of consumptive use and no storage.

Senator ANDERSON. We do want to get a point in there that we can use if we need to, to build additional projects. May I say, Mr. Ely, I don't know what is in the minds of anybody else, but as far as I am concerned, I do not desire to see the State of California deprived of one drop of water to which it is properly entitled, and I think if we had the cooperation instead of difficulties, I am not referring to the difficulties, it is in the testimony, it would be possible to construct the projects in the upper Colorado River Basin and provide sufficient storage so that when the river was well managed we would have all the water necessary to take care of the lower basin and all of the projects that the upper basin thus far, at least, can envision.

We would do it on the basis of us all being friends together, instead of on a basis where it will develop into a row between the upper and lower basins. I think it can be done. I have been trying during the days of this hearing, to assure other parts of the basins that my State does not have any designs on anybody, on the water of anybody, including either Arizona, California, or Nevada, and I think it might

be possible so to pass this bill and so to word it that those fears ought to be to some degree dissipated.

I do have some pretty strong convictions on what the Colorado compact means. I think anybody that was around at the time it was written can remember some of the history pretty clearly. I can't realize that was thirty-some-odd years ago. Maybe it was. I still like to think it was a short time ago.

I remember the enthusiasm with which Mr. Hoover and others announced the signing of that document.

Mr. ELY. Senator Anderson, I appreciate what you say, and I certainly accept at full value your assurance that you don't want to take water that belongs to California, and we don't want to take water that belongs to you, either. But unhappily we have a disagreement as to what the rights are. If I may make two additional comments—

Senator ANDERSON. Could I say, still with a smile on my face, that we believe in our State, that you don't want to take it away from us, but you certainly would enjoy delaying our getting it.

Mr. ELY. No, I would rather see you get it. I would like to see the meaning of the compact determined and have you, as well as us, get exactly the water we are entitled to. I might make these two comments, and I know it is late:

One is that the House bill on page 17, line 2, contains language that section 1 (c) of the Flood Control Act of 1944 shall not be applicable to such supplemental reports.

In other words, the Secretary does not have to submit to the affected States, including California, the reports on the proposed section 2 projects.

Senator ANDERSON. That is correct. And all that I can say is that so far as the Senate bill is concerned, as to the projects in New Mexico, he does have to submit them to the affected States and he does have to submit them back to the Congress.

Mr. ELY. The other comment I would like to make is that in closing, I think a great deal of the difficulties that we face are due to the Mexican Water Treaty. We said so in 1944. California and Nevada opposed that treaty. As a matter of fact, the water users throughout the Colorado Basin overwhelmingly opposed it, that is, the actual irrigation districts. It was unhappily supported by the State governments of five of the States at that time, in response to a plea of the State Department that they do so, recognizing the Mexican Water Treaty as a war-time agreement, and many considerations supposing to influence it.

To our mind it was the same unhappy breed as a number of wartime agreements: Yalta, on a small scale.

The results of the treaty are absolutely disastrous. They guarantee to Mexico twice what that country has ever used in the state of nature and as you pointed out, Senator, a guaranty on the Colorado River is a very difficult burden to undertake.

How we are going to solve that, I don't know.

Senator ANDERSON. I don't suppose there is any way to solve it. I have said that I think it is one of the most serious mistakes that has ever been made. I think it is the one thing that seems to make difficult the solution of the problems of the Colorado River. At one time, in discussing the Polish Corridor, I said that it wasn't very wide but so long as it was there it was wide enough to bar forever the peace in Europe. And the Mexican treaty, while not very big, is big enough

almost to destroy the hope for peace on the Colorado River as long as it is there. I think it would be well, even at this late date, to try to buy back some of the water bargained away. I think we would have to buy it back, but I would be happy to buy it back. It is worth millions and millions of dollars to us in buying back peace.

Mr. ELY. The treaty is a whole lot worse in operation than it is on its face. It guarantees a million and a half acre-feet and requires us to meet Mexico's nominations of the rate in cubic feet per second at which water shall reach the border, up to 3,500 second-feet. Actually, our Government has found it impossible to gage the releases from Hoover and Davis so as to even approximate the 3,500 second-foot figure. The water reaching the Mexican border, even at times when storage in Lake Mead is being drawn down, when it should not be drawn down, has far exceeded it. There has never been a time when the Mexicans have not received more water than the treaty entitled them to.

What will happen if Lake Mead continues to be drawn down, I cannot tell. I think that is a serious problem that deserves the attention of Congress.

Senator ANDERSON. I think that is one which the upper and lower division might well reach an agreement on.

Thank you.

We will recess now until 9 o'clock tomorrow morning.

Mr. ELY. Before I leave the stand, Senator Anderson, may I express my deep appreciation for the courtesy which I have received at the hands of yourself and the committee. While we may not agree, you have been most attentive and considerate of what I have had to say, and I appreciate it.

(The exhibits accompanying Mr. Ely's testimony are as follows:)

EXHIBIT A

IN THE SUPREME COURT OF THE UNITED STATES

October term, 1953

No. 10 Original

State of Arizona, Complainant, v. State of California, Palo Verde Irrigation District, Imperial Irrigation District, Coachella Valley County Water District, Metropolitan Water District of Southern California, City of Los Angeles, Calif., City of San Diego, Calif., and County of San Diego, Calif., Defendants

United States of America, Intervener

SUMMARY OF THE CONTROVERSY (EXHIBIT A)

(As appended to answer of California defendants to petition of intervention on behalf of the United States)

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EXHIBIT A

SUMMARY OF THE CONTROVERSY

The pleadings filed by Arizona, Nevada, the United States and California, to date, disclose complex questions of fact and law, many of which are interrelated. The summary of principal questions presented below is divided into four parts: (I) the quantities of water in controversy; (II) the ultimate issues, from the standpoint of the respective prayers; (III) a tabulation of factual issues; and (IV) the issues of interpretation of the basic documents involved. Under this division, certain questions reappear and to this extent reflect the interlocking nature of the problem.

I. THE QUANTITIES OF WATER IN CONTROVERSY

The United States seeks to quiet title to rights to the use of water, consumptive and otherwise, "as against the parties to this cause," for federal purposes, in unstated amounts.

Arizona seeks to quiet title to the beneficial consumptive use of 3,800,000 acre-feet per annum of the waters of the Colorado River System (measured by "man-made depletion of the virgin flow of the main stream") and to enjoin California's right to permanently use any water in excess of approximately 3,800,000 acre-feet per annum (measured by "diversions less returns to the river"), that being the effect of (1) reducing 4,400,000 acre-feet of III (a) water by reservoir losses, and (2) denying California any permanent right to use excess or surplus waters.

California asserts a right to the beneficial consumptive use in California of 5,362,000 acre-feet per annum of the waters of the Colorado River System (measured by "diversions less returns to the river") under contracts with the United States, comprising 4,400,000 acre-feet of the waters apportioned by Article III (a) of the Colorado River Compact and 962,000 acre-feet per annum of the excess or surplus waters unapportioned by the Compact, including in such excess or surplus the "increase of use" permitted to the Lower Basin by Article III (b) of the Compact.

Nevada seeks to quiet title to 539,100 acre-feet per annum (measured in part by both methods) of the beneficial consumptive uses apportioned by Article III (a) of the Colorado River Compact, and to not less than a total of 900,000 acre-feet from all classes of water.

As the States differ in their definition of "beneficial consumptive use," their claims require restatement in terms of a common denominator in order to evaluate their effects. Thus:

The quantity to which Arizona seeks to quiet title, 3,800,000 acre-feet per annum, measured by the method she urges, "depletion of the virgin flow of the main stream occasioned by the activities of man," is equivalent to more than 5,000,000 acre-feet measured by consumption at the site of use, or "diversions less returns to the river," the standard established by the Boulder Canyon Project Act and asserted by California. The difference is due primarily to the fact that under Arizona's interpretation, the Compact deals with the virgin flow in the main stream only and that the use of water "salvaged by man" is not charged as a beneficial consumptive use, whereas under California's interpretation the Compact deals with the waters of the entire river system and such salvage is so charged.

Conversely, the aggregate of the California contracts, 5,362,000 acre-feet per annum, measured by "diversions less returns to the river," is equivalent to only about 4,500,000 acre-feet measured by "man-made depletion" (without charge for salvaged water). If Arizona's prayer should be granted, California's rights would be reduced to about 3,800,000 acre-feet per annum, measured by "diversion less returns to the river," or to about 3,000,000 acre-feet measured in terms of "depletion of the virgin flow of the main stream."

The impact of Nevada's claims on those of the other states is not readily evaluated.

II. ULTIMATE ISSUES

The ultimate issues, in the sense of the results sought by each party, may be grouped as follows:

The United States

Does the United States have rights, "as against the parties to this cause, to the use of water in the Colorado River and its tributaries" in the following categories?

- (1) for consumptive use of all projects in the Lower Basin, which it asserts independently of any rights claimed by the States in which such projects are located;
- (2) to fulfill its obligations arising from international treaties and conventions; but this involves, with respect to the burden of the Mexican Water Treaty, the obligations as between the States of the Upper Division and the States of the Lower Division under Articles III (c) and III (d) of the Colorado River Compact, and involves also the effect of the so-called "escape clause" of Article 10 of that Treaty, which allows reduction in the guaranteed deliveries to Mexico, in the event of extraordinary drought, in the same proportion as consumptive uses in the United States are reduced, "consumptive uses" being defined in Article I of the Treaty;
- (3) to fulfill all its contracts for the delivery of water and electric power, *i. e.*, with or in Arizona, California, and Nevada; but it alleges that the water available is not sufficient to satisfy all these obligations;
- (4) to fulfill the Government's obligations to Indians and Indian Tribes; but this involves not only the questions of the magnitude and priorities of these claims but the questions of whether or not they are chargeable under the Colorado River Compact to the Basin and State in which such uses are made, what the obligation of the Upper Division States may be to release water for use by Indians in the Lower Basin, and what rights the United States may have to withhold water in reservoirs in the Upper Basin for use by Indians in both Basins;
- (5) to protect its interests in fish and wildlife, flood control and navigation; but such rights as it may have for these purposes may require the impounding and release of water from reservoirs in both Basins, and not merely reservoirs bordering or within Arizona and California, and again involves the question of accounting under the Compact; and
- (6) for use of the National Park Service, Bureau of Land Management, and Forest Service; but if the United States has claims "as against the parties to this cause" for these functions, such claims apply to all the waters of the Colorado River System in both Basins.

The adjudication of these claims of the United States requires consideration and resolutions of: questions of fact, referred to later; the power of the United States to impound and dispose of water independently of rights derived from the States; the extent of its obligations under treaties and contracts; the impact and effect of its treaties upon rights of domestic water users; how its claims to the use of water shall be measured; the location, magnitude and priorities of In-

dian claims, and claims for other alleged federal purposes; the extent to which its rights and obligations are controlled by the Colorado River Compact; and the extent to which its claims may be exercised *in futuro* in derogation of intervening rights and uses.

Arizona

Is Arizona entitled to a decree:

(1) Quieting title to 2,800,000 acre-feet per annum of the beneficial consumptive uses apportioned to the Lower Basin by Article III (a) of the Colorado River Compact, substantially all to be taken from the main stream, and measured in terms of man-made depletion of the virgin flow of the main stream?

(2) Quieting title to all of the 1,000,000 acre-feet per annum by which the Lower Basin is permitted to "increase its use" by Article III (b) of the Colorado River Compact (notwithstanding the decision of this Court in *Arizona v. California et al.*, 292 U. S. 341 (1934)), to the exclusion of the other States of the Lower Basin, all to be taken from the waters flowing in the Gila River, and to be measured in terms of man-made depletion of the virgin flow of the main stream?

(3) Reducing California's right to the uses apportioned by Article III (a) of the Colorado River Compact to approximately 3,800,000 acre-feet per annum, in consequence of reservoir losses?

(4) Enjoining California's right to receive and permanently use under its government contracts 962,000 acre-feet per annum, or any part thereof, in excess of 4,400,000 acre-feet per annum?

The determination of Arizona's claims involves: the questions of fact, later referred to; the standing of Arizona to seek a declaratory decree quieting title to a "block" of water for projects not yet constructed or authorized (about 1,600,000 acre-feet per annum of the 2,800,000 claimed from the main stream); the source of title to Arizona's claims to 2,800,000 acre-feet of III (a) water and 1,000,000 acre-feet of III (b) water; the status of the uses on the Gila; the measurement of uses thereof and of the main stream; whether Arizona's status is that of a party to the Colorado River Compact or that of a third party beneficiary of the Statutory Compact between the United States and California, and if so, whether Arizona is bound by the interpretations placed thereon by the principal parties thereto in its formulation and administration; and the validity and effect of Arizona's water delivery contract with the United States.

Most of the questions posed by Arizona's claims revolve around the issue of whether the Gila River shall be treated as a part of the Colorado River System for all purposes, or shall receive special treatment in respect of (1) the identification of uses thereon with the waters referred to in Article III (b); (2) the corollary exemption from "rights which may now exist" on the Gila from any charge under Article III (a); and (3) the devaluation of the charge for beneficial consumptive uses from the quantity which is in fact consumed on the Gila (alleged by California to be about 2,000,000 acre-feet per annum) to the lesser quantity represented by the resulting depletion in the virgin flow of the main stream (alleged by Arizona to be about 1,000,000 acre-feet per annum).

California

Are the contracts between the United States and the defendant public agencies of California for the storage and delivery of water valid and enforceable? Inasmuch as these contracts are, in terms, for permanent service but subject to the Colorado River Compact, the Boulder Canyon Project Act and the California Limitation Act, the issue is whether these enactments, considered together as a Statutory Compact established by reciprocal legislation, authorize and permit the Secretary of the Interior to presently contract for the storage and delivery for permanent beneficial consumptive use in California, of 4,400,000 acre-feet per annum of the waters apportioned by Article III (a) of the Colorado River Compact plus one-half of the excess or surplus waters unapportioned by the Compact, including in such excess or surplus the "increase of use" permitted to the Lower Basin by Article III (b) of the Compact. The aggregate of these contracted quantities, subject to physical availability of the amounts of excess or surplus waters, which vary from year to year, is 5,362,000 acre-feet per annum.

The determination of California's claims involves: the questions of fact, later referred to; the extent to which rights have vested in both the United States and California under the Statutory Compact; whether Arizona is estopped by her previous conduct from asserting her present position; whether the limitation is net of reservoir losses; how California's uses shall be measured; whether California is chargeable with the use of salvaged water; the effect of California's

appropriations, in their relation to the expressions "rights which may now exist" and "present perfected rights" in the Compact and Project Act; the definition of the Project Act term, "excess or surplus waters unapportioned by" the Colorado River Compact; the availability of such waters for permanent service; the intent of Congress with respect to the waters referred to in Article III (b); and the relation between California's contracts and the later agreements which the Secretary of the Interior has entered into with others.

Nevada

Is Nevada entitled to a decree:

(1) Quietting title to 539,100 acre-feet per annum of the beneficial consumptive uses apportioned to the Lower Basin by Article III (a) of the Colorado River Compact?

(2) Reserving for a future agreement the disposition of the use of the 1,000,000 acre-feet referred to in Article III (b) of the Colorado River Compact, and preserving to Nevada an equitable share thereof?

(3) Assuring Nevada the ultimate beneficial consumptive use of not less than 900,000 acre-feet per annum, from all classes of water?

The determination of Nevada's claims requires the consideration and resolution of: the questions of fact later referred to; the questions of interpretation previously mentioned; the question of whether Nevada's share of III (a) waters has been determined or limited to 300,000 acre-feet per annum; whether, as to stored waters, Nevada may claim any quantity in excess of her contracts with the United States; and the source of title to her claims to 539,100 acre-feet per annum of III (a) water and not less than 900,000 acre-feet per annum from all sources.

Interests of other States

There remains the question whether the claims of the United States, Arizona, California, and Nevada can be effectively determined without concurrently determining the rights and obligations of Utah and New Mexico with respect to the waters of the Lower Basin, and the rights and obligations of those states and Colorado and Wyoming with respect to other waters of the Colorado River System, to the extent that they are affected by the issues in controversy here.

In more detail, these "ultimate issues" depend upon the resolution of the following questions of fact and of the interpretation of the Colorado River Compact, the Boulder Canyon Project Act, the Statutory Compact between the United States and California, and the Mexican Water Treaty.

III. FACTUAL ISSUES

There are substantial issues of fact, raised by the pleadings to date. These include, but are not limited to, determination of:

(1) the investments and obligations undertaken by the parties in the construction of works and in the performance of their contracts with the United States, and the investments and obligations undertaken by the United States in reliance upon such contracts;

(2) the location, magnitude and priorities of the water rights necessary to enable the United States to perform its obligations to Indians and Indian tribes pursuant to Article VII of the Compact;

(3) the requirements of the United States for (a) flood control, (b) navigation, (c) fish and wildlife, and (d) the other claims which it makes;

(4) the quantities of water physically available for beneficial consumptive use in the Lower Basin, assuming full use by the Upper Basin of its Compact apportionment, full regulation of the supply available to the Lower Basin, and full performance of the Mexican Water Treaty;

(5) the uses, present and potential, on the main stream and on each tributary, determined as of the place of use, as California contends is the proper method, and the effect of those uses in terms of manmade depletion of the virgin flow of the main stream as Arizona contends is the proper method;

(6) the quantities of water "salvaged" by the activities of man, on the main stream and on the tributaries;

(7) reservoir losses, present and potential, gross and net;

(8) appropriative rights, priorities, and uses thereunder, on the main stream and tributaries;

(9) the extent and place of use of "rights which may now exist" and which, under Article III (a) of the Compact, are to be charged as uses of water appor-

tioned by Article III (a), and of "rights which may now exist" in California, within the meaning of Section 4 (a) of the Project Act; and

(10) the extent and place of use of "present perfected rights" protected by Article VIII of the Compact and directed by the Boulder Canyon Project Act to be satisfied in the operation and management of the Project.

IV. THE ISSUES OF INTERPRETATION OF THE COLORADO RIVER COMPACT, THE BOULDER CANYON PROJECT ACT, THE STATUTORY COMPACT, AND THE MEXICAN WATER TREATY

Questions relating primarily to Article III (a) of the Colorado River Compact include the following: Whether the Colorado River Compact deals only with the main stream or treats with Colorado River System waters wherever they may be found; whether the uses apportioned by Article III (a) to the Lower Basin are to be taken only from "water present in the main stream and flowing at Lee Ferry," as Arizona contends, or from the tributaries as well, as California and Nevada contend; whether the 7,500,000 acre-feet referred to in Article III (a) is related to the 75,000,000 acre-feet referred to in Article III (d), as Arizona contends, or whether the latter figure includes excess or surplus waters unapportioned by the Compact, as California contends; by what process Arizona claims to have acquired an apportionment of 2,800,000 acre-feet of III (a) water, to be taken from the main stream; whether the apportionment of 7,500,000 acre-feet "per annum" is a statement of a maximum, or of an average, and, if the latter, over what period of years; the definition and measurement of "beneficial consumptive use"; the accounting for water added to and withdrawn from storage on the main stream and tributaries; whether the use of water salvaged by man on the main stream and tributaries is to be charged under the Compact; the definition of "rights which may now exist," which are to be included in charges to water apportioned by Article III (a) and their magnitude on the main stream and tributaries; the date to which this last expression refers; whether, in the absence of a compact among the Lower Basin States, the division of water among them is to be affected by appropriative rights, *i. e.*, "rights which may now exist"; whether Indian rights, and other federal claims to consumptive use, are included within that expression and are to be charged under the Compact; whether reservoir losses are chargeable as beneficial consumptive uses, and if so, their classification under the Compact and their relation to other uses.

Questions relating primarily to Article III (b) of the Colorado River Compact include the following: The questions relating to the definition of "beneficial consumptive use" and "per annum" previously stated in connection with Article III (a); whether the "increase of use" permitted to the Lower Basin by Article III (b) is an apportionment in perpetuity as in Article III (a), as Arizona contends, or a license to acquire rights by appropriation and contracts under the Project Act in excess or surplus waters unapportioned by the Compact, as California contends; whether this right to increased use is identified solely with the water found flowing in the Gila River, as Arizona contends, or is identified with the first 1,000,000 acre-feet of increased use (above 7,500,000) per annum throughout the Lower Basin, as California and Nevada contend; whether this right is available to all five States of the Lower Basin, or to Arizona alone, as she contends (notwithstanding the decision of this court in *Arizona v. California et al.*, 292 U. S. 341 (1934)); the status of uses in New Mexico on the Gila; the status of uses on other tributaries; and to what degree reservoir losses are chargeable to this increase of use. Reference to the relation of the Mexican Treaty burden to the uses under Article III (b) appears below in connection with Article III (c).

Questions relating primarily to Article III (c) of the Colorado River Compact include the following: Whether the waters to be supplied Mexico are "apportioned" thereby (this bears upon the determination of the meaning of the expression "excess or surplus waters unapportioned by" the Colorado River Compact, appearing in the Boulder Canyon Project Act, *infra*); whether, if the quantities in excess of those specified in Articles III (a) and III (b) are insufficient to supply the deliveries to Mexico, the burden, with respect to the Lower Basin, falls first upon the uses referred to in Article III (b), as California contends, or upon those referred to in Article III (a), as Arizona contends; and the relation of the "escape clause" in Article 10 of the Treaty, which permits reduction in deliveries to Mexico in case of extraordinary drought in proportion to the reduction in consumptive uses in the United States. The relation of

Article III (c) to Articles III (d) and III (a), with respect to the obligations of the Upper Division States, is referred to below in connection with Article III (d).

Questions relating primarily to Article III (d) of the Colorado River Compact include the following: As a corollary to one of the questions stated with reference to Article III (a), whether the 75,000,000 acre-feet referred to in Article III (d) is related to the 7,500,000 acre-feet apportioned by Article III (a) to the Lower Basin, or whether the 75,000,000 acre-feet include excess or surplus waters available for delivery to Mexico or use in the Lower Basin; the resulting effect on the obligation of the States of the Upper Division stated in Article III (c) to furnish additional water to meet the deficiency if surplus above the quantities specified in Articles III (a) and III (b) is insufficient to supply Mexico; and whether the Lower Basin is entitled to demand release of this 75,000,000 acre-feet notwithstanding the consequent inability of the Upper Basin to make beneficial consumptive use of 7,500,000 acre-feet per annum.

Questions relating primarily to Article III (e) of the Colorado River Compact include the following: Whether, if excess or surplus waters are appropriated (or contracted for) in the Lower Basin, their release from storage in the Upper Basin may be required; whether, if Indians uses are not subject to the Colorado River Compact, the United States may require release of water from reservoirs in the Upper Basin to satisfy them, in addition to the water which the States of the Upper Division are required to release in performance of Articles III (c) and III (d) of the Compact; so also with respect to the other federal claims asserted by the United States "as against the parties to this cause," for use of water in the Lower Basin.

Questions relating primarily to Articles III (f) and III (g) of the Colorado River Compact include the following: Whether the provisions in these articles with reference to a compact to be made after October 1, 1963, are permissive or mandatory; whether, in the light of the Statutory Compact, these provisions preclude the acquisition of rights in excess or surplus waters by appropriation and by contract with the United States in the interim, subject only to further apportionment as between Basins by such a future compact; and whether, in the event of competing interstate claims to such excess or surplus waters, in the absence of a compact apportioning them, priority of appropriation, including contracts with the United States, controls.

Questions relating to Article VII of the Colorado River Compact include the following: Whether uses by Indians are subject to the Colorado River Compact; whether Indian uses are chargeable under the Compact to the Basin and the State in which they are situate; if not, whether they are prior and superior to the apportionments made by the Compact, or are in competition with appropriations of others which are subject to the Compact; the location, magnitude, and asserted priority of Indian claims; their effect upon the quantities available to non-Indian users under Articles III (a), III (b), etc.; their effect on the distribution of the Mexican Treaty burden; and their effect on the obligations of the States of the Upper Division under Articles III (c) and III (d).

Questions relating primarily to Article VIII of the Colorado River Compact include the following: The date to which the expression "present perfected rights" relates, *i. e.*, 1922, 1929, or some other date; the definition of said term; whether such definition is to be determined under the law of the State under which the right arose; whether the assurance against impairment extends to quality as well as quantity; the extent of these rights in each State; their relation to the expression "rights which may now exist," as used in Article III (a) of the Compact and Section 4 (a) of the Project Act; and the impact of reservoir losses when present "perfected rights" attach to, and are satisfied from stored waters, pursuant to the direction in Article VIII.

Questions relating primarily to the Boulder Canyon Project Act and the resulting Statutory Compact between the United States and California include the following: Whether the alternative consent given in the Project Act to a Seven-State or Six-State Compact became final on June 25, 1929, in establishing the latter; whether Arizona could, or did, effectively ratify a Seven-State Compact thereafter; if so, whether the Statutory Compact authorized by the Project Act as a corollary to a Six-State Compact remains in effect; if it does, whether Arizona can claim the benefits of both; whether the Statutory Compact authorized contracts to be made with the California defendants for the permanent service (in addition to 4,400,000 acre-feet of III (a) waters) of one-half of the excess or surplus waters unapportioned by the Compact for use in California; whether it included therein the waters referred to in Article III (b), or precluded California from use of such waters; whether the "excess or surplus," of which

California may use one-half, is to be reckoned before or after deduction of the quantity required to be delivered to Mexico; the effect on California's right to "excess or surplus" of a future compact apportioning such waters; whether the limitation "for use in California" is net of reservoir losses, or is subject to further reduction in consequence of such losses; whether the definition of consumptive uses applicable to California is applicable to Arizona, and vice versa; whether California is free to make use of salvaged waters without charge under the Compact or the Limitation Act; the effect of California's appropriations; the meaning and effect of the reference to "rights which may now exist" in Section 4 (a) of the Project Act; the extent of California's "present perfected rights" as referred to in Section 6 of the Project Act; whether by the Project Act, or otherwise, the shares of Nevada or Arizona in the waters of the Colorado River System have been determined; and the construction and effect of the water delivery contracts held by those States.

GOODWIN J. KNIGHT, GOVERNOR, STATE OF CALIFORNIA

DEPARTMENT OF PUBLIC WORKS,
OFFICE OF THE DIRECTOR,
Sacramento, February 15, 1954.

HON. DOUGLAS MCKAY,
*Secretary of the Interior, Department of the Interior,
Washington, D. C.*

DEAR SIR: Your proposed supplemental report on the Colorado River storage project and participating projects, transmitted to the President on December 10, 1953, was received in this office on December 23, 1953, with letter of transmittal from the Acting Commissioner of Reclamation to Governor Goodwin J. Knight, and forwarded to the division of water resources of this department for study and review.

On February 2, 1954, a request was sent to you for additional detailed substantiating information in order to permit a thorough analysis and appraisal of the proposed developments.

Since it appears that the proposed developments are now under active consideration by the executive departments and the Congress, looking toward an early decision, it is understood that comments of all interested States are desired without delay. Accordingly, a report has been prepared by the division of water resources in collaboration with the Colorado River Board of California, setting forth the general views of the State of California; subject, however, to such modifications as are deemed necessary when and if detailed substantiating information has been received and the proposals have been given further consideration. This report has been received and is transmitted herewith.

I concur in the comments submitted and request that they be considered as expressing the views of the State of California on your proposed report. It is further respectfully requested that the report, dated February 15, 1954, 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.

Very truly yours,

FRANK B. DURKEE, *Director of Public Works.*

STATEMENT OF THE STATE OF CALIFORNIA ON PROPOSED SUPPLEMENTAL REPORT OF THE SECRETARY OF THE INTERIOR ON COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS, DATED DECEMBER 10, 1953

INTRODUCTION

Reference is made to letter of December 15, 1953, by Acting Commissioner of Reclamation H. F. McPhail to Gov. Goodwin J. Knight, of California, transmitting copies of a supplemental report of the Secretary of the Interior, dated December 10, 1953, on the Colorado River storage project and participating projects, and inviting comments. The project was originally reported upon by the Bureau of Reclamation in Project Planning Report No. 4-8a.81-1 dated December 1950. That report is incorporated, with modifications, in the Secretary's supplemental report.

The 1950 report presented a plan of development of the upper Colorado River Basin comprising 10 major dams and reservoirs with hydroelectric plants on the Colorado River and principal tributaries above Lee Ferry, and an indefinite

number of water-using projects designated "participating projects." That report recommended approval of the overall plan and initial authorization and construction of 5 units of the storage project and 10 new participating projects, and inclusion as participating projects of 2 irrigation developments already authorized and under construction.

The supplemental report of December 1953 recommends approval of the overall plan, initial authorization and construction of the Glen Canyon and Echo Park units of the storage project, authorization for immediate construction of the same 10 new participating projects, inclusion of the same 2 previously authorized projects as participating projects and authorization of the Shiprock division of the Navaho project, including Navaho Dam and Reservoir, with actual construction of the Navaho project to be referred until a report thereon has been approved by the Congress.

Cost estimates for the storage units and the participating projects in the Secretary's supplemental report are revised upward as compared to the estimates in the 1950 report. There also appears to be some revision in the assumptions as to power output and revenues and allocation of costs of the storage project, although no explanation is given.

A proposed repayment program is recommended which would involve postponement of repayment of the irrigation costs beyond the ability of the water users to repay until after the power investment in the storage units is repaid with interest. It is estimated in the financial operation study attached to the report that it would take 56 years to pay off the power investment with interest.

This proposal differs from the repayment program proposed in the 1950 report, under which it was planned to divert and use the interest charged on power investment to repay the portion of the irrigation costs beyond the ability of the water users to repay.

PREVIOUS VIEWS AND RECOMMENDATIONS

Under date of June 14, 1951, the State of California submitted to former Secretary of the Interior Oscar L. Chapman its views and recommendations on the original project planning report dated December 1950. From those views and recommendations the following is quoted :

"Therefore, the State of California favors congressional authorization of the specific projects set forth in the proposed report of the Secretary of the Interior or as may be modified, and their construction with Federal funds consistent with national welfare if (a) such projects qualify under criteria, policies, and procedures of the Congress, and (b) the diversion and utilization of the waters of the Colorado River system by and through these projects will not impair the rights of the State of California or any of its agencies to the waters of that system as defined and set forth in the Colorado River compact and related laws and documents."

It was further stated that the phrase "criteria, policies, and procedures of the Congress" was intended to refer to "uniform criteria, policies, and procedures to be established by the Congress."

COMMENTS ON SUPPLEMENTAL REPORT

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. It is the duty of the State to protect and preserve those rights of its citizens. California is, therefore, rightfully concerned in proposals for the further development of the water resources of the Colorado River Basin wherever such developments may be. For this reason it is necessary for the State to analyze thoroughly any proposals for further development and take whatever steps appear required to insure that such developments would not impair the rights of California and its agencies in and to the waters of the Colorado River system.

The Colorado River storage project and participating projects as proposed in the report under review would obviously have substantial effect upon the available water supply and the operation of facilities in the lower basin and California. Furthermore, the plan of financial operation of the project as proposed by the Department of the Interior departs materially from existing reclamation law and is not in accordance with sound standards and policies.

The comments herein are directed, first, to the effects of the proposed project on California's rights to Colorado River water and, secondly, to basic questions of criteria, policies, and procedures involved in the proposals. These have been prepared by the division of water resources in collaboration with the Colorado River Board of California.

Because of the lack of supporting detail in the supplemental report under review, the comments are necessarily based largely on the substantiating material presented in the original 1950 report and the accompanying special reports on individual participating projects.

Effects on California's rights to Colorado River water

The engineering studies presented in the original 1950 report and the related special reports on participating projects and the supplemental report of the Secretary of the Interior are vague and uncertain with respect to the effects of proposed upper basin developments on the water supply available to the lower basin, the rights of California thereto, and the operation of facilities in the lower basin. The plans for construction and operation of the proposed developments, insofar as revealed in these reports, give no proper or adequate consideration to the interests of the lower basin States. Furthermore, the studies involve or imply what California considers to be erroneous interpretations of the Colorado River compact.

The erroneous interpretations of the compact include: (1) that article III (a) apportions to the upper basin a water use of 7,500,000 acre-feet a year in terms of depletion of the virgin flow at Lee Ferry instead of a beneficial consumptive use of 7,500,000 acre-feet a year at places of use; (2) that the upper basin would be entitled to the consumptive use of an average annual amount of 7,500,000 acre-feet instead of a maximum of 7,500,000 acre-feet in any one year. Because of these erroneous interpretations, the report is invalid as regards the showing of how soon and how much holdover storage will be needed and as regards the ultimate quantity and pattern of residual flow into the lower basin at Lee Ferry.

There are at least 10 serious questions of interpretation of the compact which would be involved in and affect the proposed storage project and related reclamation developments. (See statement of Northcutt Ely on behalf of Colorado River Board of California at hearings on H. R. 4449 before Subcommittee on Irrigation and Reclamation of Committee on Interior and Insular Affairs of House of Representatives, January 26, 1954.) All of these questions are at issue in the pending case of *Arizona v. California, et al.*; United States Supreme Court, October term, 1953, No. 10 original.

California's basic position is that this State is conforming to the Colorado River compact and must insist that the Bureau of Reclamation and the States of the upper basin do so in the planning and administration of the Colorado River storage project and participating projects.

As to annual variation in consumptive use requirements, there appears to be no justification for the assumption in the report that under full development, with a regulated water supply and with practically all the irrigated land receiving a full supply each year, the water requirement and use would be highest in wet years and lowest in dry years. This assumption cannot be reconciled with the results of the latest scientific investigations of the subject, and therefore is a probable source of further error in the findings in the reports on the storage project and participating projects.

It is evident that the building, filling and operation of the proposed main-stream reservoirs, with an ultimate total capacity of about 48 million acre-feet, would have substantial effect upon lower basin facilities and operations. Even the filling of the two reservoirs, Glen Canyon and Echo Park, now proposed for initial authorization with combined capacity of 32 million acre-feet, would have a material effect and would present serious problems.

Who is to have the final decision and control as to the operation of these holdover reservoirs, including storage and release of water? Article III (e) of the Colorado River compact provides that the States of the upper division shall not withhold water and the States of the lower division shall not require the delivery of water which cannot reasonably be applied to domestic and agricultural use. Glen Canyon Reservoir and certain other proposed upper basin main-stream reservoirs will be so located physically that no water stored therein can ever be applied to domestic or agricultural uses in the upper basin. All of the water stored in such reservoirs will be required for domestic and agricultural use in the lower basin and Mexico. Furthermore, consideration

must be given to the Government's obligations to maintain the contracted firm power output at Hoover Dam.

No discussion of such problems, including the inevitable reduction in power output at lower basin plants and its economic effect from a national standpoint, is presented in the reports. Insofar as the original basic report or the 1953 supplement indicate, there is no evidence that the effects on operation of lower basin storage and power facilities have been given due consideration in planning the schedules of constructing, filling, and operating the proposed upper basin storage and power facilities.

Of equal concern to the problems of quantity and fluctuation of flow into the lower basin at Lee Ferry is the problem of quality of water. This problem concerns water users throughout the basin, but especially those in the lower basin States. Increased consumptive use of the waters of the Colorado River and its tributaries in the upper basin, particularly the relatively pure water of the headwater streams, will result in higher concentrations of mineral salts in the residual flow downstream.

The provisions in the Colorado River compact of water for the lower basin would be largely nullified if the supply were unsuited in quality for all beneficial purposes. Furthermore, article VIII of the compact provides: "Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact." Certainly, this means unimpaired in quality as well as quantity.

The reports are completely lacking of information that would provide answers to the questions concerning quality of water. It is California's position that before development proceeds on any additional large scale consumptive use projects in the upper basin, the entire problem of quality of water should be fully explored; that determination should be made as to the effects of increased upper basin uses up to full development, upon the quality of the flow at Lee Ferry; and that authorization of such additional projects, particularly transmountain diversion projects, in the upper basin should be deferred until satisfactory evidence is presented that such projects, in combination with existing projects and other projects contemplated under full development, would not have harmful effects on the quality of water remaining for use in the lower basin.

It is evident from the foregoing that there are a number of unknowns remaining to be determined as to water supply and use in the upper basin, and as to the amount of water that would be expected to be available to the lower basin passing Lee Ferry under conditions of ultimate development in the upper basin with full practicable utilization of the water supply apportioned to the upper basin under the Colorado River compact. This points up the need for a comprehensive system of gaging and sampling stations to measure both quantity and quality of water throughout the basin in order to determine the water supply available and the actual use of water. It is considered essential that more adequate measurements and records of water supply and use be obtained which will permit reliable studies to be made of the operation of existing and proposed developments in the upper basin and of the resulting available water supply, both as to quantity and quality, passing Lee Ferry for the lower basin.

Criteria, policies, and procedures

The laws governing Federal reclamation development are embodied in the original Reclamation Project Act of 1902 and the Reclamation Project Act of 1939, as amended. Therein are set forth the criteria, policies, and procedures of general application which may be collectively designated as existing reclamation law. For the purposes of this review, only certain features of the law will be referred to.

Existing reclamation law provides that the reimbursable construction costs of irrigation reclamation projects shall be repaid within a period of 40 years, without interest, in 40 equal annual installments. In the case of a project for irrigation of new lands, it permits a development period not to exceed 10 years, during which no repayment may be required.

Where a project includes facilities for municipal water supplies, the law provides that the reimbursable cost chargeable thereto shall be repaid in 40 years, with interest if deemed proper by the Secretary of the Interior.

Where a reclamation project includes hydroelectric power features, the law provides for reimbursable cost to be repaid with interest within a period of 40 to 50 years.

Present law permits nonreimbursable allocations of reclamation project costs for flood control, navigation, and fish and wildlife in the case of projects which include features to perform these purposes.

The repayment program recommended by the Secretary in the supplemental report constitutes a material departure from established criteria, policies, and procedures of general application in existing reclamation law.

It appears to be similar to that authorized by the Congress specifically for the Collbran project, Colorado (Public Law 445, 82d Cong., approved July 3, 1952). The special repayment provisions in that act are set forth as exceptions to existing reclamation law. It was stated at recent hearings before the House Interior and Insular Affairs Committee that at the time the committee passed upon the Collbran project bill, approval of the repayment formula therein was specifically for that project alone and was not to be considered as establishing a precedent for other reclamation projects.

The proposed repayment program, if adopted, would involve the postponement of the repayment of the costs allocated to irrigation on the storage units and on a major portion of the irrigation costs of the participating projects, for a period of about 50 years. These irrigation costs for which repayment would be deferred would comprise, according to the report, a minimum of about \$268 million, plus an unknown amount for the Navaho project.

Studies of the original reports on the participating projects indicate that about 85 percent of the irrigation costs would be repaid without interest by power revenues. Considering the time value of money, the postponement for about 50 years of repayment of a large part of the construction cost of the proposed development would obviously require a subsidy from the Federal Treasury that would have to be paid out of Federal taxes. The interest charges on the funds borrowed by the Federal Government to defray the irrigation costs of the project would never be repaid from project revenues and would have to be paid out of taxes even if the capital investments were eventually repaid.

It is recognized that the provision, under existing law, of interest-free money for irrigation reclamation projects involves a substantial subsidy from the Federal Treasury which must be borne out of taxes, comprising the cost of interest on funds advanced, which in a period of 40 years would aggregate an amount almost equal to the original capital investment even though the principal be fully repaid in equal annual installments during the 40-year period.

It would appear that the Secretary's proposal in the report under review, for repayment would in effect extend the development period, during which no repayment would be made on a major portion of the investment, to about 50 years for both new land and old lands receiving a supplemental water supply. Such a postponement in repayment obviously would greatly multiply the amount of the Federal subsidy involved.

Owing to the lack of detailed information on the revised costs, no exact figure for the amount of the subsidy that would be involved in the proposed repayment program can be given. However, it could be readily calculated if detailed information on costs were available. In any case, the accumulated debt or total subsidy would amount to several times the original investment. Whether this would be in the national interest is for the Executive and the Congress to determine. However, it is believed that a report should be made as to the true cost of the Federal subsidy involved under the proposed repayment program, so that the Executive and the Congress will be fully informed before making a decision with respect thereto.

Under the proposed program and method of financing, it appears that justification of the initially proposed participating irrigation projects and future decisions to build additional participating irrigation projects would depend not so much upon the merits of the individual projects as upon the availability of revenues, 50 or more years in the future, from power projects generally unrelated thereto physically. None of the participating projects recommended for initial construction would be in themselves financially sound according to information in the basic storage project report and the reports of 1950 and 1951 on the individual participating projects.

On the average the water users would be able to pay only about 15 percent of the irrigation investment on the 12 participating projects. The balance of the cost would have to be subsidized—the capital investment by power revenue and the interest charges in even greater amount for an indefinite period by the Federal Treasury through taxes.

To the extent that high power rates could and would be maintained for the next 75 to 100 years or more to subsidize additional participating irrigation projects, authorization of the overall plan of upper basin development as proposed in the report, with such program and procedure would constitute an advance appropriation of funds for the construction of future projects of unknown engineering and financial feasibility.

The Colorado River storage project appears to be basically a hydroelectric power project. The only showing of economic justification in the report is based solely on power revenues. Considered in this light, the financial feasibility of the storage project appears open to question for several reasons. Repayment of the reimbursable construction costs within the periods and at the power rates proposed would depend entirely upon: (1) Allocation of a large portion of the construction cost to irrigation on an interest-free basis; (2) postponement of the starting of repayment of the irrigation allocation for about 50 years; and (3) subsidization of the more costly units with surplus power revenues earned by the less costly units.

No clear and adequate justification is shown in support of the allocation of a large part of the cost of the storage project to irrigation. Justification for the allocation to irrigation of several hundred million dollars (over \$98 million for the initial 2 units) depends upon the future authorization of projects for consumptive use of water in the upper basin. Only minor use could be made of the regulatory reservoirs of the storage project directly for water-consuming projects. Future irrigation projects as a rule would require individual storage facilities.

The one reason given for the proposed allocation to irrigation on the storage project is that the storage units would provide holdover capacity so that the upper basin can proceed with the development and use of water without violating the Colorado River compact. Information in the basic report shows that at the present and anticipated future rate of upper basin development, Glen Canyon alone would suffice for this purpose for 40 to 50 years hence. Furthermore, it appears that the additional consumptive use estimated for the participating reclamation projects proposed for initial authorization in the Secretary's report could be made even without Glen Canyon Reservoir.

However, the early construction of Glen Canyon Reservoir would be justified from other considerations and advantages. Based upon the cost analyses in the report, the Glen Canyon Reservoir and power development could be constructed and operated on a sound financial basis and, therefore, merits authorization at this time.

Analyses indicate that the cost of power from most of the other proposed units of the storage project, considered individually and on the basis of either the total cost or the power allocations alone, would be greater than the proposed selling price, and that, in fact, power revenues from the Glen Canyon unit would have to subsidize most, if not all, of the other storage units in addition to subsidizing participating irrigation projects. It appears questionable, therefore, whether certain of the storage units would be justified or needed, from the standpoint of either the holdover storage requirements or the value of the power produced.

The original 1950 report indicates an intent to market the power output of the upper-basin storage and power units in the upper-basin States, with little regard to potential market and needs for electric power in the lower-basin States. This question of power disposal is referred to in the supplemental report as a matter of policy to be determined.

There appears to be some question in the report as to the ability of the power market in the upper-basin States to absorb all of the power output, even of the initial two storage and power units, for a number of years in the future. Glen Canyon power could be readily disposed of in the lower basin, where there is a great need for additional power. It is believed that the question of policy on disposal of power, particularly from Glen Canyon, merits the special consideration of the Executive and the Congress.

CONCLUDING COMMENTS

1. California agencies have established rights in and to the waters of the Colorado River system under the Colorado River compact and related documents. The State of California has the duty of protecting and preserving those rights. Obviously, construction and operation of the proposed Colorado River storage project and participating projects would have substantial effect upon the quantity and quality of the available water supply and the operation of facilities in the lower basin and in California. The State is concerned that such developments shall not impair the established rights of California and its agencies in and to Colorado River water.

2. There are at least 10 major questions of interpretation of the compact which would be involved in and affect the proposed storage project and related reclamation developments. With respect to several of these questions the report under review is based upon what California believes are erroneous inter-

pretations of the compact. All of the questions are at issue in the pending case of *Arizona v. California et al.*, in the United States Supreme Court. California's basic position is that this State is conforming to the Colorado River compact and must insist that the Bureau of Reclamation and the States of the upper basin do so in the planning and administration of the Colorado River storage project and participating projects.

3. Revised analyses should be made and reported upon, based upon proper interpretation of the Colorado River compact, as to the need for holdover storage and as to the probable effects of its construction, filling, and operation upon the quantity and pattern of flow into the lower basin at Lee Ferry and upon the operation of lower-basin facilities.

4. Before development proceeds on any additional large-scale consumptive-use projects in the upper basin, a determination should be made as to the effects of increased upper-basin uses up to full development, upon the quality of the flow at Lee Ferry; and authorization of such additional projects, particularly transmountain diversion projects, in the upper basin should be deferred until satisfactory evidence is presented that such projects, in combination with existing projects and other projects contemplated under full development, would not have harmful effects on the quality of water remaining for use in the lower basin.

5. The plans for construction and operation of the upper-basin storage project and related reclamation projects, insofar as revealed in the original 1950 report and the Secretary's supplemental report under review, give no proper or adequate consideration to the effect of the proposals on the lower-basin developments and evidence little, if any, regard to the interests of the lower basin. Moreover, the engineering studies are vague and uncertain with respect to the effect of proposed upper-basin developments on the lower basin and additional studies are essential with respect thereto. The State of California desires full information as to what the effect of the proposed plan will be on existing and future developments below Lee Ferry and particularly on the quality and quantity of water available for use in California.

6. There are many problems that should and must be carefully studied and solved before authorizing or proceeding with any overall plan of development in the upper basin. In the meantime, some additional development could proceed if found justified for authorization by the Congress. However, it is the position of the State of California that the interests of the lower basin, and of California in particular, must be fully protected with proper safeguards in connection with any legislation for authorizing of additional development in the upper basin to the end that the construction and operation of the proposed projects shall fully conform with the Colorado River compact and related laws and documents.

7. The plan of financial operation of the project recommended by the Secretary departs materially from existing reclamation law and is not in accord with sound standards and policies. The proposed postponement for about 50 years of the repayment of a large part of the cost would result in a substantial increase in the national debt, constituting a subsidy to irrigation on the part of the Nation's taxpayers far beyond the subsidy contemplated under existing law. The magnitude of such subsidy should be clearly stated and explained in the report.

8. None of the participating reclamation projects recommended for initial authorization would be in themselves financially feasible. The water users could repay only small proportions of the reimbursable construction costs. The balance of the cost would have to be subsidized—the capital investment by power revenue and the interest charges in even greater amount for an indefinite period by the Federal Treasury through taxes.

9. No clear and adequate justification is shown in support of the allocation of a large part of the storage-project cost to irrigation on an interest-free basis. Only minor use could be made of the regulatory reservoirs of the storage project directly for water-consuming projects. The report indicates that the proposed allocation to irrigation on the storage project is based upon the need of holdover capacity to permit the upper basin to develop and use the water without violating the compact. However, it appears from the report that the additional consumptive use estimated for the reclamation projects proposed for initial authorization could be made without holdover storage, and that at the anticipated rate of development Glen Canyon Reservoir alone would suffice for this purpose for 40 to 50 years hence. Therefore, the justification for immediate construction of initial units of the storage project would be based upon other considerations and purposes to be served.

10. The early construction of Glen Canyon Reservoir would be justified from the standpoint of other immediate advantages. Based upon the cost analyses in the report, the Glen Canyon Reservoir and power development could be constructed and operated on a sound financial basis and therefore merits authorization at this time.

11. Glen Canyon power could be readily disposed of in the lower basin where there is a great need for additional power. The question of policy regarding its disposal merits the special consideration of the Executive and the Congress.

12. The cost of power for most of the proposed major storage and power units, other than Glen Canyon, would be greater than the proposed selling price for power, and interunit subsidies would be required principally from Glen Canyon power revenues to support the other units. It appears questionable, therefore, whether certain of the storage units would be justified or needed, from the standpoint of either the holdover storage requirements or the value of the power produced.

13. The proposal recommended by the Secretary for the Colorado River storage project and participating projects raises basic questions as to the proper criteria to determine the financial feasibility and economic justification of new reclamation developments, and particularly the criteria, policies, and procedures for repayment, and the amount of Federal subsidy that is justified. These basic questions are a matter of national policy which must and should be decided by the Executive and the Congress.

14. The State of California, in analyzing its own projects and in reviewing proposed Federal reclamation projects in California, has consistently stood for sound financial and economic standards upon which proposed developments should be evaluated and qualified for approval and authorization. It is the view of the State of California that all water-development projects, including the proposed projects under review herein, should qualify under sound criteria of feasibility and repayment as a matter of national policy in the best public interest.

Submitted by :

A. D. EDMONSTON,
State Engineer.

Approval recommended.

RAYMOND MATTHEW,
Chief Engineer, Colorado River Board of California.

Approved.

FRED W. SIMPSON,
Chairman, Colorado River Board of California.

SACRAMENTO, CALIF., *February 15, 1954.*

EXHIBIT C

(Accompanying testimony of Northcutt Ely)

Resolutions opposing S. 1555 and H. R. 4449, the Colorado River storage project bills in the 83d Congress, have been adopted by the following :

Colorado River Board of California
Imperial Irrigation District
Metropolitan Water District of Southern California
Los Angeles City Council
Central Labor Council of Los Angeles
Department of Water and Power of the City of Los Angeles
San Diego County Water Authority
San Diego City Council
Imperial County Board of Supervisors
Imperial County Farm Bureau
Holtville, Calif., Chamber of Commerce
Calexico, Calif., Chamber of Commerce
Calexico City Council
Coachella Valley County Water District
Rainbow Municipal Water District, San Diego County, Calif.
California State Chamber of Commerce, southern California council
Brawley, Calif., Chamber of Commerce
Brawley City Council
Calipatria, Calif., Chamber of Commerce

Westmorland, Calif., City Council
Council of the City of Burbank
Board of Supervisors of Orange County
Board of Directors of the City of Pasadena.

RESOLUTION OF COLORADO RIVER BOARD OF CALIFORNIA OPPOSING PENDING LEGISLATION AUTHORIZING COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

The Colorado River Board of California opposes the enactment of S. 1555 and H. R. 4449, 83d Congress, bills to authorize the Secretary of the Interior to construct, operate, and maintain initial units of the Colorado River storage project and participating projects, and for other purposes.

California favors the continuation of the development of the water resources of the Colorado River Basin on a sound economic basis, as the need for such development occurs. This State recognizes the right of the upper-basin States to so utilize the waters apportioned to that basin by the Colorado River compact as approved by the Boulder Canyon Project Act, but subject to the terms and conditions of those documents as the Supreme Court may construe them in the case of *Arizona v. California* now pending.

By the same token, California, in the protection of its investment of nearly \$700 million in water-development projects which it has made in reliance upon the Colorado River compact and the Boulder Canyon Project Act, and the economy and population of more than 4 million people dependent upon these works, must resist legislation which would encroach upon the rights recognized in the lower basin States by those documents.

The proposed Colorado River storage project legislation adversely affects the lower basin States in much the same way as would the proposed central Arizona project legislation. Both are based upon interpretations of the Colorado River Compact and the Boulder Canyon Project Act with which California cannot agree and which are now at issue in the United States Supreme Court. Each of them contemplates developments which would encroach upon the compact and project act, as interpreted at the time of enactment of those laws, to the extent of more than a million acre-feet per year. Both proposals are based upon unrealistic water supply estimates. Each is in conflict with the presentation made to the Senate by the supporters of the Mexican Water Treaty. Each ignores the legal claims which are in conflict with it, and both ignore the damage which their construction would cause to the investments already made by their neighbors. Each of these proposals is dependent upon Federal subsidies for irrigation amounting to many times the value of the land when fully developed, and most of these subsidies are concealed. Both would commit the Congress to new feasibility standards and payout formulas with which this board and other California State agencies have officially expressed disapproval.

The Colorado River storage project would intercept the lower basin's water supply with giant reservoirs at Glen Canyon, Echo Park, and Curecanti, capable of storing several years' flow of the river. In the absence of statutory controls of the operation of such reservoirs designed to protect the output of firm power at Hoover Dam, upon which the United States and the power contractors relied, the use of such large storage could result in seriously curtailing the revenues at Hoover Dam and other dams on the lower river and upon which these lower projects depend for financing. It is against the best interest of both the power users in the lower basin and the Federal Treasury to so legislate.

Both Glen Canyon and Echo Park Reservoirs would be located downstream from any point of use by the proposed irrigation projects in the upper basin, and their major purpose would be to provide revenues, commencing almost 50 years hence, to pay the capital cost without interest of the irrigation projects proposed for construction now. This postponement for nearly 50 years of the commencement of repayment of irrigation would result in a Federal subsidy amounting to over \$2,500 per acre of irrigated land—an unwarranted and unjustified burden on the Nation's taxpayers.

California, as a major taxpaying State, is doubly affected, for the amount of the overdraft on the water supply of the Colorado River Basin is directly related to the amount of Federal subsidy to the irrigation projects creating the overdraft.

The bills delegate to the Secretary of the Interior power to resolve the feasibility of the participating irrigation projects. If reclamation feasibility standards are to be changed, that should be done by Congress, in general legislation.

after the Hoover Commission has had an opportunity to report upon this very matter, heretofore committed to their study.

The proposed legislation includes some, and foreshadows other, large trans-mountain diversion projects in the upper basin using several million acre-feet of water annually, thereby impairing the quality as well as the quantity of the water available to the lower basin, and to which the lower basin is entitled under the Colorado River compact.

For all these reasons, the Colorado River Board of California respectfully requests the Representatives of this State in the Senate and House of Representatives of the United States to oppose the enactment of legislation to authorize construction of the Colorado River storage project and participating projects as proposed in these bills, S. 1555 and H. R. 4449, or similar legislation, and instructs its officers and staff to make the appropriate presentation of the views of this board to the congressional committees and executive agencies concerned with such legislation.

STATE OF CALIFORNIA,
County of Los Angeles, ss:

I, Harold F. Pellegrin, executive secretary of the Colorado River Board, do hereby certify that the foregoing is a true copy of a resolution unanimously adopted by said board at a regular meeting thereof, duly convened and held at its office in Los Angeles on the 2d day of June 1954, at which a quorum of said board was present and acting throughout.

Dated this 2d day of June 1954.

HAROLD F. PELLEGRIN,
Executive Secretary,

RESOLUTION OF IMPERIAL IRRIGATION DISTRICT, APPROVING TWO RESOLUTIONS OF COLORADO RIVER BOARD OF CALIFORNIA, AND EXPRESSING CONFIDENCE IN SAID BOARD AND ITS REPRESENTATIVES AND ADVISERS

RESOLUTION NO. 137-54

Whereas there has been called to the attention of the directors of Imperial Irrigation District, an irrigation district organized and existing under the laws of California, and serving in excess of one-half million acres of land in Imperial County, Calif., two certain resolutions of Colorado River Board of California, passed and adopted on June 2, 1954, which resolutions oppose S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas Imperial Irrigation District is a member agency and represented upon said Colorado River Board, and said Colorado River Board is an agency created by the legislature of the State of California to protect the interests of the State of California in and to the use and uses of waters of the Colorado River system; and

Whereas said two resolutions opposing Senate bills 964 and 1555 and House of Representative bills 236 and 4449, 83d Congress, which bills would authorize that certain project in California designated as the Frying Pan-Arkansas project, and would authorize a Colorado River storage project and participating project, all as more particularly outlined in said bills; and

Whereas the State of California and the Colorado River Board, representing the water users in California of the waters of the Colorado River system, have a vital interest in the waters of the Colorado River system; and

Whereas it is the honest belief of the board of directors of Imperial Irrigation District that said two resolutions of June 2, 1954, of the Colorado River Board opposing said pending legislation for the reasons and to the extent in said resolutions indicated are not only justified but are essential to the protection of the interests of the State of California and California's use of the waters of the Colorado River system; and

Whereas the board of directors is fully familiar with the organization and activities of said Colorado River Board, and has full confidence in this district's representation upon said Colorado River Board and in the advisers and representatives of this district, cooperating with and advising said Colorado River Board;

Now, therefore, on motion of Director Watton and seconded by Director McFarland, be it hereby resolved as follows:

1. That this board of directors does hereby go on record as expressing its confidence in the sincerity and purpose and activities of said Colorado River Board of California.

2. That this board expressed its confidence in the sincerity and purpose and activities of its representatives and advisers on and to said Colorado River Board of California.

3. That this board expresses its approval of said two resolutions which are hereto attached as passed by said Colorado River Board, and does hereby authorize and direct the secretary of this board to give full distribution to this resolution, including the mailing of copies of said resolutions to all Members of Congress in the State of California.

Passed and adopted June 8, 1954, by unanimous vote of this body.

IMPERIAL IRRIGATION DISTRICT,
By EVAN T. HEWES, *President*.
By MAHLON I. MATHIS, *Secretary*.

[SEAL]

IMPERIAL IRRIGATION DISTRICT,
Office of the Secretary, ss:

This is to certify that the foregoing is a full, true, and correct copy of resolution No. 137-54 passed by the board of directors of Imperial Irrigation District at its regular session on the 8th day of June 1954.

In witness whereof, I have hereunto set my hand and affixed my seal of said district this 8th day of June 1954.

[SEAL]

MAHLON I. MATHIS, *Secretary*.

BOARD OF DIRECTORS, THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

RESOLUTION 4438

Whereas the Metropolitan Water District of Southern California is one of the principal contractors, under the Boulder Canyon Project Act, for the storage and delivery of water from Lake Mead and for the delivery of electrical energy from the Hoover powerplant, and has a vital interest in the water available to the lower basin of the Colorado River under the Colorado River Compact, both as to quality and quantity, and also has a vital interest in the continued production of electrical energy from the Hoover powerplant in accord with estimates upon which the United States and California agencies relied in financing the project; and

Whereas there are pending in the Congress of the United States certain bills, to wit, S. 1555, H. R. 4449, S. 964, and H. R. 236, which, if enacted, would authorize large storage reservoirs and irrigation works in the upper basin of the Colorado River; and

Whereas the estimates of water available for the projects so sought to be authorized are based on erroneous interpretations of the Colorado River compact—these erroneous interpretations are adverse to the interests of millions of people in southern California whose lives and economy have been established upon the assurance that they would retain their share of Colorado River water; these erroneous interpretations are now under attack in the Supreme Court of the United States; and

Whereas said bills do not contain adequate provisions safeguarding the quality of water in the lower basin and do not contain adequate controls of the operation of the vast storage reservoirs proposed needed to protect the energy output from the Hoover power project; and

Whereas the Colorado River Board of California has adopted resolutions opposing the said bills and stating the reasons for its opposition: Now, therefore, be it

Resolved, That the enactment of said bills is against the interests of the Metropolitan Water District and other California agencies, and should be opposed; be it further

Resolved, That the Metropolitan Water District respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of the said bills or similar legislation, and further requests the municipalities and other agencies constituting the area of the Metropolitan Water District to join in requesting and urging such opposition.

I hereby certify, that the foregoing is a full, true, and correct copy of a resolution adopted by the board of directors of the Metropolitan Water District of Southern California, at its meeting held June 9, 1954.

A. L. GRAM,
Executive Secretary,
The Metropolitan Water District of Southern California.

CITY OF LOS ANGELES

RESOLUTION

Whereas the city of Los Angeles and the more than 2 million persons who now reside here are dependent upon the Colorado River for vitally important quantities of water and power for civic needs, as well as for residential and industrial uses; and

Whereas the share of Colorado River water and power for which this city has contracted and which it must continue to have to sustain its economy is threatened under the provisions of bills S. 1555 and H. R. 4449 now pending in Congress, which bills would authorize the initial units of the Colorado River storage project and participating projects: Now, therefore, be it

Resolved, That the Los Angeles City Council, acting for the welfare of the city and its residents, expresses its strong opposition to bills S. 1555 and H. R. 4449 and urges the Senators and Representatives in Congress from the State of California to oppose the enactment of that legislation; be it further

Resolved, That a copy of this resolution be sent to Vice President Richard M. Nixon, Senators William F. Knowland, and Thomas H. Kuchel, all Members of Congress from the State of California, and all members of the Rules Committee of the House of Representatives.

HAROLD A. HENRY,
 CHARLES NAVARRO.

JUNE 23, 1954.

RESOLUTION

Whereas the Central Labor Council has consistently opposed legislation injurious to the welfare of the citizens of this city and the Nation; and

Whereas the Colorado River storage project bill (H. R. 4449), now pending before the Congress, would inflict on all American taxpayers an unjustifiable new burden; and

Whereas the economy of this city, the State of California, and the Nation would be seriously impaired by this costly and unnecessary project: Now, therefore, be it

Resolved, That the Central Labor Council vigorously oppose passage of H. R. 4449 by the Congress.

Adopted in regular session of the Los Angeles Central Labor Council, June 21, 1954.

[SEAL]

W. J. BASSETT, *Secretary.*

RESOLUTION No. 1003

Whereas the Department of Water and Power of the City of Los Angeles has the obligation to provide for the water and power needs of the present population of this city, now numbering more than 2 million persons, and for the additional population that will have to be served as the city continues to grow; and

Whereas the Colorado River is depended upon as the sole source of water supply available now to meet that daily increasing need, all other sources of supply available to Los Angeles already being used to their limits; and

Whereas the Colorado River, through the Hoover Dam powerplant, is the largest single source of power supply for the city of Los Angeles and, in addition, generates hydroelectric power for other cities and utilities of this State, including the Metropolitan Water District, as well as for the States of Arizona and Nevada; and

Whereas the long-planned use by California of its fair share of the natural resources of the Colorado River is jeopardized by bills S. 1555 and H. R. 4449

now pending in Congress, which bills would "authorize the Secretary of the Interior to construct, operate, and maintain initial units of the Colorado River storage project and participating projects, and for other purposes"; and

Whereas premature and hasty action on those bills, while the Hoover Commission is still conducting its comprehensive studies on a national water resources policy program, would make drastic and piecemeal changes in reclamation law and would deprive the Congress of the benefit of a "yardstick" to measure the true economic costs and values of the proposed projects; and

Whereas California is vitally concerned with the proper management of the Colorado River so that all of the States entitled to share in its resources, under the terms of the "law of the river," may do so with greatest possible benefits to the respective States and to the United States: Now, therefore, be it

Resolved, That bills S. 1555 and H. R. 4449 in their present form be opposed because further engineering, legal, and economic studies, including the findings of the Hoover Commission, are essential for the guidance of all interests, local and national, that have the responsibility of making sound decisions respecting the future development of the resources of the Colorado River.

I hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held June 15, 1954.

JOSEPH L. WILLIAMS, *Secretary*.

A RESOLUTION OF MEMBERS OF THE BOARD OF DIRECTORS OF THE SAN DIEGO COUNTY WATER AUTHORITY OPPOSING COLORADO RIVER STORAGE PROJECT AND FRYINGPAN-ARKANSAS PROJECT, AND ENDORSING ACTION OF COLORADO RIVER BOARD OF CALIFORNIA IN RESPECT THEREOF

RESOLUTION NO. 318

The San Diego County Water Authority is the distributor of Colorado River water to the city and county of San Diego, Calif. Its citizens and taxpayers have obligated themselves for the payment of many millions of dollars the full cost of the works constructed for that purpose. The economy of the area and the water supply of its inhabitants depend upon the continued availability of water from the Colorado River in the quantity and of the quality to which California is entitled under the Colorado River compact and the Boulder Canyon Project Act.

The citizens of San Diego County, and, in fact, all of California, pay a very large proportion of taxes collected by the Federal Government, and consequently have a serious concern that Federal funds be not expended on projects of questionable economic feasibility or which must be financed by heavily subsidized formulas—with the result that California taxpayers are financing both their own projects and those for other areas that may result in diminishing the quantity and quality of the water upon which large sections of the State must depend.

The Colorado River Board of California opposes the enactment of the acts authorizing the Colorado River storage project (S. 1555 and H. R. 4449, 83d Cong.) and the Fryingpan-Arkansas project (S. 964 and H. R. 236, 83d Cong.) for the reasons that the projects would adversely affect the quantity and quality of the water to which this State is entitled, and could not be constructed without unwarranted Federal subsidies and financed upon a formula lacking economic feasibility.

The San Diego County Water Authority endorses and approves the position taken by the Colorado River Board, and joins in respectfully urging the representatives of this State in the Senate and House of Representatives to stand united in opposition to the enactment of legislation authorizing these projects—and to exert every effort to protect the people of this State from improper invasion of their water rights and unfair tax burdens to finance unsound projects.

STATE OF CALIFORNIA.

County of San Diego, ss:

I, Dorothy D. Miller, executive secretary of the San Diego County Water Authority, hereby certify that the foregoing is a true copy of a resolution approved by a majority of the members of the board of directors of said San Diego County Water Authority this 9th day of June 1954.

Executive Secretary of the Board of Directors, San Diego County Water Authority.

RESOLUTION No. 118512

Whereas the city of San Diego is a member of the San Diego County Water Authority and as such is a distributor of water to the city of San Diego, Calif. Its citizens and taxpayers have obligated themselves for the payment of many millions of dollars as the full cost of the works constructed for that purpose. The economy of the area and the water supply of its inhabitants depend upon the continued availability of water from the Colorado River in the quantity and of the quality to which California is entitled under the Colorado River compact and the Boulder Canyon Project Act.

Whereas the citizens of San Diego and, in fact, all of California, pay a very large proportion of taxes collected by the Federal Government, and consequently have a serious concern that Federal funds be not expended on projects of questionable economic feasibility or which must be financed by heavily subsidized formulas—with the result that California taxpayers are financing both their own projects and those for other areas that may result in diminishing the quantity and quality of the water upon which large sections of the State must depend.

Whereas the Colorado River Board of California opposes the enactment of the acts authorizing the Colorado River storage project (S. 1555 and H. R. 4449, 83d Cong.) and the Fryingpan-Arkansas project (S. 964 and H. R. 236, 83d Cong.) for the reasons that the projects would adversely affect the quantity and quality of the water to which this State is entitled, and could not be constructed without unwarranted Federal subsidies and financed upon a formula lacking economic feasibility: Now, therefore, be it

Resolved by the Council of the City of San Diego, as follows:

That the city of San Diego endorses and approves the position taken by the Colorado River Board, and joins in respectfully urging the representatives of this State in the Senate and House of Representatives to stand united in opposition to the enactment of legislation authorizing these projects—and to exert every effort to protect the people of this State from improper invasion of their water rights and unfair tax burdens to finance unsound projects.

Adopted June 10, 1954.

Presented _____.

Approved as to form by _____.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE TO COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the Board of Supervisors of the County of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555, and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said board opposes said pending legislation for the reasons and to the extent as in said resolution indicated, and this body feels that said Colorado River Board is justified in its position: Now, therefore, on motion of Supervisor Snyder, seconded by Supervisor Cavanah, there is hereby

Resolved as follows, on the affirmative rollcall vote of Supervisors Cavanah, Boley, Fifield, and Snyder, Supervisor Osborne being absent, 1. That we do

hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board, and authorize the county clerk to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 21st day of June 1954, by the unanimous action of this body.

BOARD OF SUPERVISORS OF THE COUNTY OF IMPERIAL,
STATE OF CALIFORNIA,
By THOMAS J. BOLEY, *Chairman*.
By HARRY M. FREE, *County Clerk*.

The foregoing is a correct copy of a resolution adopted by the board of supervisors, Imperial County, Calif., on June 21, 1954.

Dated June 22, 1954.

HARRY M. FREE,
Clerk of Said Board of Supervisors.
By E. W. DEMONEY, *Deputy*.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the Imperial County Farm Bureau, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River board was authorized and created and provided for by the Legislature of the State of California as an agency to protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas as evidenced by the said two resolutions of June 2, 1954, of the Colorado River board, said board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River board is justified in its position: Now, therefore,

On motion of Baater Loveland, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River board, and authorize the secretary to mail copies of said resolution to all California Members of Congress.

Passed and adopted June 1954, by the unanimous action of this body.

IMPERIAL COUNTY FARM BUREAU,
By D. M. MIDDLETON, *President*.
By VERA PARKER, *Acting Secretary*.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE TO COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the chamber of commerce of the city of Holtville, county of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River

Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that a certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas, as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River Board is justified in its position: Now, therefore,

On motion of Arthur Lockie, seconded by C. L. Martin, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board, and authorize the secretary of this body to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 21st day of June 1954, by the unanimous action of this body.

CHAMBER OF COMMERCE OF THE CITY OF HOLTVILLE,
COUNTY OF IMPERIAL, STATE OF CALIFORNIA,
PAULE J. NICK, *Secretary*.

I, Paule J. Nick, secretary of the Holtville Chamber of Commerce, do hereby certify that the foregoing resolution was unanimously passed and adopted by the board of directors of the Holtville Chamber of Commerce, at a regular meeting thereof, held the 21st day of June 1954, at which a quorum of said board was present and acting throughout.

Dated June 21, 1954.

PAULE J. NICK, *Secretary*.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE TO COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the chamber of commerce of the city of Calexico, county of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555, and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas, as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said board opposes said pending legislation for the

reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River Board is justified in its position: Now, therefore,

On motion of Earl Cavanah, seconded by Dexter Wright, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board, and authorize the secretary of this body to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 17th day of June 1954, by the unanimous action of this body.

CHAMBER OF COMMERCE OF THE CITY
OF CALEXICO, COUNTY OF IMPERIAL,
STATE OF CALIFORNIA,

By HUGH E. JAMISON, *President*.
By DAN KLEIN, *Secretary*.

[SEAL]

RESOLUTION No. 1251, CITY OF CALEXICO, CALIF.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the city council of the city of Calexico, county of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress, and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River System, and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills, and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River board was authorized and created and provided for by the Legislature of the State of California as an agency to protest the interests of the State of California in and to the waters of the Colorado River system, and

Whereas as evidenced by the said two resolutions of June 2, 1954, of the Colorado River board, said board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River board is justified in its position;

Now, therefore, on motion of Carrillo, seconded by Barnes, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River board, and authorize the city clerk to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 15th day of June 1954, by the unanimous action of this body.

CITY COUNCIL OF THE CITY OF CALIFORNIA, COUNTY
OF IMPERIAL, STATE OF CALIFORNIA,

By WM J. OSBORN, *Mayor*.
By RICHARD S. EMERSON, *City Clerk*.

STATE OF CALIFORNIA,
County of Imperial, ss:

I, Richard S. Emerson, city clerk of the city of Calexico do hereby certify that the above and foregoing Resolution No. 1251 was duly passed and adopted by the city council of the city of Calexico in regular session on the 15th day of June 1954 by the following vote to wit:

Ayes: Osborn, Reed, Barnes, Carillo.

Noes: None.

Absent: Jackson.

[SEAL]

RICHARD S. EMERSON,
City Clerk, City of Calexico.

RESOLUTION No. 54-29 OF THE BOARD OF DIRECTORS OF COACHELLA VALLEY COUNTY WATER DISTRICT

Be it resolved by the board of directors of the Coachella Valley County Water District, as a public agency of the State of California and a user of Colorado River water, in regular meeting assembled this 8th day of June 1954, That those two certain resolutions adopted by the Colorado River Board of the State of California on the 2d day of June 1954, entitled "Resolution of Colorado River Board of California Opposing Pending Legislation Authorizing Colorado River Storage Project and Participating Projects" and "Resolution of Colorado River Board of California Opposing Pending Legislation Authorizing Fryingpan-Arkansas Project in Colorado" be and the same are hereby approved and concurred in by this district with the same force and effect as if set out verbatim herein: Be it further

Resolved. That the secretary of this district be and she is hereby instructed to immediately forward to each Member of the United States Congress representing the State of California a certified copy of this resolution, together with a copy of each of the two resolutions of the Colorado River Board of the State of California, as hereinabove mentioned, attached hereto.

STATE OF CALIFORNIA,
County of Riverside, ss:

I, Barbara K. Schmid, secretary of the Coachella Valley County Water District, hereby certify that the foregoing is a true copy of a resolution unanimously adopted by the board of directors of said district at a regular meeting of said board of directors held on the 8th day of June 1954.

Dated this 10th day of June 1954.

[SEAL]

BARBARA K. SCHMID,
Secretary, Coachella Valley County Water District.

RESOLUTION OF THE RAINBOW MUNICIPAL WATER DISTRICT OPPOSING THE COLORADO RIVER STORAGE PROJECT AND FRYINGPAN-ARKANSAS PROJECT, AND ENDOSSING THE ACTION OF THE COLORADO RIVER BOARD OF CALIFORNIA IN RESPECT THERETO

RESOLUTION NO. 8

Whereas the Rainbow Municipal Water District is a distributor of Colorado River water to the residents, citizens, and taxpayers located within the corporate area of the Rainbow Municipal Water District, and its citizens and taxpayers have obligated themselves for the payment of large sums of money used and to be used to defray the cost of works constructed for that purpose; and

Whereas the economy of its area and the water supply of its inhabitants depend upon the continued availability of water from the Colorado River in a quantity and of a quality to which California is entitled under the Colorado River compact and the Boulder Canyon Project Act; and

Whereas the citizens of the Rainbow Municipal Water District pay taxes collected by the Federal Government, and consequently have a serious concern that Federal funds be not expended on projects of questionable economic feasibility or which must be financed by heavily subsidized formulas with the result that its taxpayers are financing both their own projects and those of other areas, that may result in diminishing the quantity and quality of the water upon which this district and large sections of the county of San Diego and the State of California must depend; and

Whereas the Colorado River Board of California opposes the enactment of the acts authorizing the Colorado River storage project (S. 1555 and H. R. 4449, 83d Cong.) and the Fryngpan-Arkansas project (S. 964 and H. R. 236, 83d Cong.) for the reasons that the projects would adversely affect the quantity and quality of the water to which the State of California is entitled, and could not be constructed without unwarranted Federal subsidies and financed upon a formula lacking economic feasibility: Now, therefore, it is

Resolved, That the Rainbow Municipal Water District endorses and approves the position taken by the Colorado River Board of California, and joins in respectfully urging the representatives of this State in the Senate and House of Representatives to stand united in opposition to the enactment of legislation authorizing these projects, and to exert every effort to protect the people of this district, of the county of San Diego and of the State of California from improper invasion of their water rights and unfair tax burdens to finance unsound projects.

STATE OF CALIFORNIA,

County of San Diego, Rainbow Municipal Water District, ss:

I, Ben G. Martin, secretary of the Rainbow Municipal Water District, hereby certify that the foregoing is a true and correct copy of a resolution duly and regularly passed by unanimous vote of all of the directors of said district at a meeting held on the 11th day of June 1954.

BEN G. MARTIN,

Secretary of the Board of Directors and of the Rainbow Municipal Water District.

CALIFORNIA STATE CHAMBER OF COMMERCE,
Los Angeles, Calif., June 1954.

RECOMMENDATIONS OF THE SOUTHERN CALIFORNIA COUNCIL SEMI-ANNUAL MEETING
AT LOS ANGELES, MAY 26, 1954

Twenty subjects of current concern to business were considered by seven committees of the Southern California Council meeting at the Statler Hotel, Los Angeles, on May 26, 1954. Following are recommendations of the council adopted at the general luncheon session, which are referred to the appropriate statewide committees and to the board of directors for approval and final implementation by the State chamber organization.

Background data respecting any of these recommendations or other items on the program sent to council members may be obtained by contacting the southern California regional office.

The agricultural committee, Donald A. Stevning, chairman, considered problems in the marketing of agricultural products and discussion of possible entry into the United States from northern Mexico of the Mexican fruitfly resulted in the following recommendation:

That the appropriate committees of Congress be fully advised of this situation with the request that funds be made available to carry on the work of the United States Department of Agriculture in attempting to prevent entry of this pest into California; and, further, that the United States Government urge the Government of Mexico to instigate adequate control measures against this pest in Mexico.

The natural resources committee, Frederick W. Simpson, chairman, heard comment on offshore oil development and the current thinking on best use of State tidelands funds. Regarding the threat to southern California's Colorado River water supply contained in two legislative bills now before Congress calling for almost complete development of the upper Colorado River Basin in Wyoming, Utah, and Colorado, and the proposed creation of a new State water department, the committee made the following recommendations:

That the State chamber of commerce support the position of the Colorado River Board of California and oppose the present upper Colorado River Basin projects as provided in H. R. 4449 and S. 1555 and the so-called Arkansas-Fryngpan project in H. R. 236 and S. 964.

That the State chamber of commerce support legislation in the next session of the legislature to create a new and independent State water department.

The highway committee, Frank G. Forward, chairman, was informed of State freeway location policies and studied assembly constitutional amendment 32, which proposes use of highway-tax funds for parking facilities, and problems

in connection with proposed bus turnouts on freeways, resulting in the following recommendations:

That the Southern California Council recommends that the California State Chamber of Commerce oppose assembly constitutional amendment No. 32, which will appear as a ballot proposition at the November 1954 general election.

That the Southern California Council recommends that the California State Chamber of Commerce set up a special study committee within the statewide highway committee for the purpose of studying all aspects of the proposal that bus turnouts be provided upon metropolitan freeways.

The tax committee, Clarence A. Rogers, vice chairman, regarded the State budget for 1954-55, separation of taxation from liquor administration (S. C. A. 4), and State finance of public-school construction (S. C. A. 3), adopting the following recommendations:

That the Southern Council approve senate constitutional amendment No. 4, which would establish a department of alcoholic-beverage control and an appeal board.

That the Southern Council approve the senate constitutional amendment No. 3 which will authorize the issuance of \$100 million by the State for grants and loans to school districts for school construction.

The travel and recreation committee, H. H. (Bob) Roberts, chairman, received reports on the 1953-54 southern California winter-sports season, some proposals for development of beaches and parks with State tidelands funds, southern California's current roadside-cleanup and roadside-rests programs, and developed the following recommendations:

That the Southern California Council urge the State chamber to continue to give top priority to the roadside cleanup campaign.

That the Southern California Council urge the State chamber to take steps to get house action on bills now before the House Committee on Agriculture to provide funds for sanitation and improved recreation facilities in national forests.

The industrial and industrial insurance committees (in joint session), Edward Mills, chairman of latter group, presiding, reviewed pension plans and collective bargaining, legislative studies on unemployment insurance, and the future of workmen's compensation insurance, and discussed trends in Federal and State labor-management legislation. No recommendations were made.

An industrial survey workshop, George N. Hawley presiding, was held to provide chamber of commerce managers and local industrial development interests with practical aids and answers on the best procedures and methods to employ in compiling community industrial surveys.

ATTENDANCE AT SOUTHERN CALIFORNIA COUNCIL MEETING, STATLER HOTEL,
LOS ANGELES, MAY 26, 1954

IMPERIAL COUNTY	ORANGE COUNTY—CON.	RIVERSIDE COUNTY—CON.
Bill Duffock	H. F. Kenny	G. R. Gough
Leonard McClintock	Allen S. Koch	A. C. Keith
	Stephen F. Michalec	Donald Stevning
INYO COUNTY	H. G. Osborne	Tyler Suess
Bertha Horine	Walter Schmid	Walter E. Vaughn, Jr.
	Ross A. Shafer	R. H. Westbrook
	Donald S. Smiley	A. Chesnaye Woodill
ORANGE COUNTY	Willard Smith	
Herb Alleman	H. Sprenger	SAN BERNARDINO COUNTY
A. A. Beard	Harry Welch	Donald DeMent
J. A. Bradley	C. L. Young	John H. Fairweather
J. H. Bray		J. Clay Garrison
P. H. Budd	RIVERSIDE COUNTY	Max H. Green
Robert L. Clark	L. M. Backstrand	William F. Hauser
Ted Craig	D. R. Crane	Horace P. Hinckley
Eric E. Eastman	Stuart A. Cundiff	C. V. Kane
Selim H. Franklin	Sam Dictor	George McCarthy
Clint Flynn	Nelson S. Dilworth	Frank H. Mogle
William Gallienne	R. R. Drake	Frank E. Mosher
Mrs. G. R. Gough	Dennis P. Flanagan	Mrs. Pearl Pettis
George Kellogg	George C. Gerwing	J. J. Prendergast

ATTENDANCE AT SOUTHERN CALIFORNIA COUNCIL MEETING, STATLER HOTEL,
LOS ANGELES, MAY 26, 1954—Continued

SAN BERNARDINO COUNTY—
continued

George W. Savage
George R. Seals
H. P. Shawlee
Maj. L. A. Silvernail
E. Q. Sullivan
John W. Swoap
Floyd A. Taylor
D. M. Tucker
A. W. Walker
Robert L. Walker
R. V. Ward

SAN DIEGO COUNTY

John F. Borchers
Frank G. Forward
Robert Hays
J. F. Jorgensen
R. M. Levy
J. H. Mack
Albert E. Matlack
Bob Rundell
M. J. Shelton
Ray E. Schafer
Frederick C. Sherman
Fred Simpson
E. E. Wallace
Gilbert S. Wright

SANTA BARBARA COUNTY

C. Leo Preisker
Clarence A. Rogers
Stanley T. Tomlinson
O. V. Wilson

VENTURA COUNTY

Clifford F. Ahlers
Al Albinger
Thomas L. Bailey
Edwin C. Bixby
John S. Broome
Mrs. Ina E. Clifton
Joseph F. Daly
A. C. Hardison
Robert W. Lefever
Lloyd E. McCampbell
L. S. Peterman
James F. Shiells
Alma K. Stark
William H. Tolbert

OUT OF DISTRICT

R. W. Bruce
Stanley Burke
Thomas W. Caldecott
Frank P. Gomez
E. S. Gregory
C. N. Gustafson
Carter Harrison

OUT OF DISTRICT—CON.

Carl Lloyd
William J. Losh
A. F. Mather
S. E. Wood
C. W. Weinberger
Victor H. Owen, Jr.
E. J. L. Peterson

LOS ANGELES COUNTY

R. F. Ahern
Howard P. Allen
J. C. Allen
Frederic L. Alexander
W. E. Alworth
George O. Alloway
A. W. Althouse
William Andrews
E. R. Arner
H. G. Arnold
Jim Armstrong
Wesley S. Bagby
Harrison R. Baker
L. D. "Joe" Bale
Hugh Barnes
Stuart M. Bate
Fdwyn Bates
Frank D. Battistini
R. H. Beaton
Ed Beaty

E. E. Benedict
E. Maxwell Benton
Sidney H. Bierly
C. D. Bishop
Harry F. Blaney
Thomas W. Blazey
Russell S. Bock
Max Bookman
R. E. Boyden
George E. Boyson
John R. Brainard, Jr.
Calvin E. Bream
William Breiby
Milton Breivogel
Harold U. Brown
I. E. Brown
Mrs. Nedra Brown
Ralph Buffon
G. S. Bulkley
Lewis Burke
T. S. Burnett
Norman E. Burns
Carl Bush
John D. Bushnell
Curtis C. Byrne
John C. C. Byrne
Leo Carrillo
Homer F. Caswell
Jim R. Chaffee
Bernard E. Chamberlain
Robert L. Chambers
Chuck Chandler
Larry Chandler

LOS ANGELES COUNTY—CON.

Felix Chappellet
A. L. Chavannes
Dale V. Clanton
Harry Cheshire
Ralph O. Chick
N. L. Clarine
D. E. Cole
Guthrie Collins
M. E. Collins
J. William Connor
Elmer Cook
Lawrence T. Cooper
F. W. Converse
C. W. Coughlin
William F. Cowan
Charles J. Cox
Glenn A. Crawford
William B. Crowell
Art Curry
A. N. Curtiss
Roger H. Davis
M. M. Davore
Mrs. Stanley D. Decker
Arthur H. Deibert
Louis F. DeMartini, Jr.
Anthony J. DiStasi
James A. Doherty
Homer L. Duffy
Ralph C. Durke
E. E. East
William J. Edelhauser
L. E. Edwards
Mrs. Liston M. Edwards
W. E. Elleson
Matt English
Garabed Eznirlian
W. L. Fahey
Paul S. Farr
H. G. Feraud
L. W. Ferguson
Ralph V. Fitting
Ben S. French, Jr.
V. F. Frizzell
L. E. Fuller
Lamar W. Gardner
R. V. Garrod
Douglas G. Gittins
Wesley J. Gordon
Theodore Grant
Robert Greenwald
H. V. Griffiths
John D. Hackstaff
Frank B. Hagan
Mrs. Jean W. Haley
Mrs. Waldo E. Handy
Phil Townsend Hanna
George B. Hanson
Allen D. Harper
Mrs. John H. Harris
Paul Harvey
Earl A. Hawkes
George N. Hawley
Edwin C. Heath

ATTENDANCE AT SOUTHERN CALIFORNIA COUNCIL MEETING, STATLER HOTEL,
LOS ANGELES, MAY 26, 1954—Continued

LOS ANGELES COUNTY—CON. LOS ANGELES COUNTY—CON. LOS ANGELES COUNTY—CON.

Mrs. Robert G. Hees
 F. R. Herrmann
 Miss Jo Anne Hewitt
 Charles J. Higson
 H. F. Holley
 L. W. Hood
 R. S. Horne
 E. Horsfall
 F. J. Hortig
 C. H. Howard
 James S. Howie
 H. R. Hudson
 L. A. Irvin
 W. M. Jacobs
 Hayden F. Jones
 Robert L. Jordan
 Waldo Johns
 W. H. Johnson
 Ken Kendrick
 Howard Kennedy
 Sam R. Kennedy
 Boyd Kern
 M. William Killars
 Alfred H. King
 S. E. Kingsley
 Raymond W. Kinne
 Don J. Kinsey
 LeRoy G. Kline
 George Klimmer
 Mrs. George Klimmer
 L. E. Knox
 Charles L. Kopp
 O. John Krause
 Dr. J. R. Lacayo
 C. L. LaForce
 Stanley M. Lanham
 Frank Lanterman
 Lloyd Lanterman
 Howard F. LeBaron
 Charles T. Leeds
 C. R. Leslie
 Harold K. Levering
 A. M. Levy
 C. C. Lincoln
 W. R. Lindersmith
 Ernest L. Leon
 Leonard Longacre
 Thomas L. Lowe
 Mrs. J. M. Luney
 F. C. Lynch
 LeRoy E. Lyon, Sr.
 R. F. MacNally
 Joe Manning
 Merth E. Martenson
 George E. Martin
 Fels Matheny

C. Chris Matthews
 Jack Matthews
 Raymond Matthew
 J. C. E. McClure
 Robert McClure
 Harold McGlynn
 A. D. McLennan
 John A. McNeil
 DeWitt Meredith
 Ruth E. Meilandt
 Earl O. Miller
 Howard A. Miller
 Jack Miller
 Edward Mills
 Robert L. Minckler
 R. A. Moody
 C. B. Moore
 R. E. Moon
 Howard V. More
 Tom T. Morris
 Beatrice Mozanoff
 Karl R. Naumann
 Lynn Newcomb
 Luther A. Nichols
 William Howard Nicholas
 T. S. Norton
 R. A. Olmsted
 Elmer Olsen
 Emery E. Olson
 L. W. Olson
 Robert F. O'Neill
 LeRoy D. Owen
 Don Packer
 G. R. Pahlman
 Charles H. Palmer
 Kyle Palmer
 W. J. Palmer
 John G. Payson
 Everett B. Peck
 H. H. Peters
 W. F. Peterson
 Everett A. Philipp
 O. V. Pope
 W. R. Powell
 C. L. Prow
 William A. Pixley
 Walter L. Reynolds
 H. C. Rice
 J. E. Richardson
 Lyman P. Robertson
 H. H. Roberts
 Stewart J. Rogers
 L. D. Romig
 R. W. Rood
 Leigh Russell
 W. D. Shaw

James G. Shea
 David G. Shearer
 George H. Shellenberger
 M. B. Silberberg
 John A. Simpson
 John E. Skelton
 Charles K. Slack
 Francis M. Small
 Earl A. Smith
 Clarence L. Smith
 William French Smith
 F. W. Spencer
 Marvin J. Stacy
 Charles R. Stapleton
 Dave Starr
 John B. Steinweden
 Kenneth C. Stever
 Ron Stever
 Bryant Stirdivant
 M. Stockwell
 Erich F. Stuewe
 D. F. Swartling
 E. Wood Tebbe
 Edward T. Telford
 W. C. Tesche
 Calvin T. Thomas
 John M. Thompson
 Thomas W. Tily
 George W. Trefts
 N. Bradford Trenham
 George N. Tucker
 Thomas F. Tugwell
 R. C. Trygstad
 Max Eddy Utt
 James E. Umfrid
 T. L. Van Law
 Clark F. Waite
 F. C. Walker
 Paul D. Walker
 Jack Wallace
 A. G. Walsworth
 Paul K. Webster
 Earl M. Welty
 S. F. Whaley
 David L. Williams
 J. S. Willmarth, Jr.
 Melvin D. Wilson
 Hugo H. Winter
 Floyd Wohlwend
 L. H. Wohlwend
 Homer H. Woodling
 D. W. Woods
 Harold W. Wright
 Mildred Younger
 Richard H. Zeller

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE TO COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the Chamber of Commerce of the City of Brawley, County of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River Board is justified in its position: Now, therefore,

On motion of William Dillard, seconded by Gene Bryant, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board, and authorize the secretary of this body to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 10th day of June 1954 by the unanimous action of this body.

CHAMBER OF COMMERCE OF THE CITY OF
BRAWLEY, COUNTY OF IMPERIAL, STATE OF
CALIFORNIA,
By D. E. WEBB, *President*,
By D. WAYNE ROBERTSON, *Secretary*.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the City Council of the city of Brawley, county of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to

protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said Board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River Board is justified in its position: Now, therefore,

On motion of W. L. Powell, seconded by Joe Rodriguez, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board, and authorize the city clerk to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 21st day of June 1954, by the unanimous action of this body.

CITY COUNCIL OF THE CITY OF BRAWLEY, COUNTY
OF IMPERIAL, STATE OF CALIFORNIA,

By PAT WILLIAMS, *Mayor*.

By CHARLES A. WARREN, *City Clerk*.

[SEAL]

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-KANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE TO COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the chamber of commerce of the city of Calipatria, county of Imperial, State of California, copies of which are hereto attached and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 449, 83d Congress; and

Whereas this body is familiar with the organization, functions and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 449, 83d Congress, which bills would authorize that certain project in Colorado designated at the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to protest the interests of the State of California in and to the waters of the Colorado River System; and

Whereas as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River Board is justified in its position.

Now, therefore, on motion of William H. Sorenson, seconded by Harry Momita, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board, and authorize the secretary of this body to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 16th day of June 1954, by the unanimous action of this body.

CHAMBER OF COMMERCE OF THE CITY OF CALIPATRIA,
COUNTY OF IMPERIAL, STATE OF CALIFORNIA.

By GORDON B. BARRINGTON, *President*.

By R. M. CHAPMAN, *Secretary*.

RESOLUTION APPROVING THE COLORADO RIVER BOARD OF CALIFORNIA AND ITS POSITION OPPOSING PENDING LEGISLATION AUTHORIZING THE FRYINGPAN-ARKANSAS PROJECT IN COLORADO AND ITS RESOLUTION OPPOSING PENDING LEGISLATION RELATIVE COLORADO RIVER STORAGE PROJECTS

Whereas two resolutions have been called to the attention of the City Council of the City of Westmorland, County of Imperial, State of California, copies of which are hereto attached, and which have been passed by the Colorado River Board of California on June 2, 1954, opposing S. 964 and H. R. 236, and S. 1555 and H. R. 4449, 83d Congress; and

Whereas this body is familiar with the organization, functions, and activities of the Colorado River Board of California and its representation of California in connection with matters relating to the Colorado River system; and

Whereas said two resolutions oppose Senate bills 964 and 1555 and House of Representatives bills 236 and 4449, 83d Congress, which bills would authorize that certain project in Colorado designated as the Fryingpan-Arkansas project and would authorize a Colorado River storage project and participating projects, more particularly set forth in said bills; and

Whereas the State of California has a vital interest in the waters of the Colorado River system and said Colorado River Board was authorized and created and provided for by the Legislature of the State of California as an agency to protect the interests of the State of California in and to the waters of the Colorado River system; and

Whereas, as evidenced by the said two resolutions of June 2, 1954, of the Colorado River Board, said board opposes said pending legislation for the reasons and to the extent as in said resolutions indicated, and this body feels that said Colorado River Board is justified in its position: Now, therefore, on motion of Councilman Stuart, seconded by Councilman Martin, there is hereby resolved as follows:

1. That we do hereby express our confidence in the Colorado River Board of California as representing the interests of California as to the Colorado River system and the waters thereof.

2. We do hereby expressly approve said two resolutions which are hereto attached as the action of said Colorado River Board and authorize the city clerk to mail copies of said resolution to all California Members of Congress.

Passed and adopted this 14th day of June 1954 by the unanimous action of this body.

[SEAL]

CITY COUNCIL OF THE CITY OF WESTMORLAND,
 COUNTY OF IMPERIAL, STATE OF CALIFORNIA,
 By BEULA A. RUSSELL, *Mayor*.
 By ELIZABETH HUFFINER, *City Clerk*.

RESOLUTION No. 9780, OPPOSING SENATE BILL 1555; HOUSE BILL 4449; S. 964 AND H. R. 236 OR SIMILAR LEGISLATION PENDING IN THE CONGRESS OF THE UNITED STATES

Whereas the city of Burbank is vitally dependent upon a water supply obtained from the Colorado River; and

Whereas the Colorado River storage project as proposed in S. 1555 and H. R. 4449 and the Fryingpan-Arkansas project as proposed in S. 964 and H. R. 236, now pending in the Congress of the United States of America, would jeopardize the water rights and the water supply of the city of Burbank, Calif.; and

Whereas the aforementioned projects would inflict on the taxpayers of the city of Burbank and on the entire Nation an unjustifiable burden: Therefore be it *Resolved*, That the enactment of these project bills is against the interest of the city of Burbank and should be opposed; and be it further

Resolved, That the city council of the city of Burbank, Calif., respectfully request the representatives of the State of California in the Congress of the United States to oppose the enactment of the above-mentioned bills or any similar legislation and that copies of this resolution be forwarded by the city clerk forthwith to the Hon. William F. Knowland and Hon. Thomas H. Kuchel, United

States Senators, and to all the California Representatives in the Congress of the United States.

Passed and adopted this 25th day of June 1954.

CARL M. KING,

President of the Council of the City of Burbank.

Attest:

NAOMI G. PUTNAM,

City Clerk.

STATE OF CALIFORNIA,

County of Los Angeles, City of Burbank, ss:

I, Naomi G. Putnam, city clerk of the city of Burbank, do hereby certify that the foregoing resolution was duly and regularly passed and adopted by the council of the city of Burbank at its regular adjourned meeting held on the 25th day of June 1954 by the following votes:

Ayes: Councilmen Bank, Blais, Hilton, and King.

Noes: None.

Absent: Councilman Jolley.

NAOMI G. PUTNAM,

City Clerk.

RESOLUTION OF THE BOARD OF SUPERVISORS OF ORANGE COUNTY, CALIF.,
JUNE 15, 1954

On motion of supervisor Featherly, duly seconded and carried, the following resolution was adopted:

Whereas the county of Orange in the State of California is vitally dependent on a water supply obtained from the Colorado River:

Whereas the Colorado River storage project bill (H. R. 4449), now pending in the Congress, would jeopardize the water rights and the water supply of the county of Orange:

Whereas the Colorado River storage project would inflict on the taxpayers of this county and the Nation an unjustifiable burden: Therefore be it

Resolved by the Board of Supervisors of Orange County. That the enactment of the Colorado River storage project bill is against the interests of the county of Orange and should be opposed; be it further

Resolved. That the county of Orange respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of this bill or any similar legislation.

Ayes: Supervisors C. M. Featherly, Willard Smith, Ralph J. McFadden, Heinz Kaiser, and Willis H. Warner.

Noes: None.

Absent: None.

STATE OF CALIFORNIA,

County of Orange, ss:

I, B. J. Smith, county clerk and ex-officio clerk of the Board of Supervisors of Orange County, Calif., hereby certify that the above and foregoing resolution was duly and regularly adopted by the said board at a regular meeting thereof held on the 15th day of June 1954 and passed by a unanimous vote of said board.

In witness whereof, I have hereunto set my hand and seal this 15th day of June 1954.

B. J. SMITH,

County Clerk and ex-officio Clerk of the Board of Supervisors of Orange County, Calif.

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE CITY OF PASADENA OPPOSING
FEDERAL LEGISLATION AUTHORIZING COLORADO RIVER STORAGE PROJECTS

Whereas the city of Pasadena is dependent on a water supply obtained from the Colorado River; and

Whereas the Colorado River storage project as proposed in S. 1555 and H. R. 4449 and the Fryingpan-Arkansas project as proposed in S. 964 and H. R. 236, now pending in the Congress, would jeopardize the water rights and the water supply of the city of Pasadena; and

Whereas the projects aforesaid would inflict on the taxpayers of this city and the Nation an unjustifiable burden: Therefore be it

Resolved, That the enactment of these project bills is against the interest of the city of Pasadena and should be opposed: be it further

Resolved, That the city of Pasadena respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of the bills aforesaid or any similar legislation.

EXHIBIT D

RESOLUTIONS OF THE AMERICAN PUBLIC POWER ASSOCIATION, MAY 1954, OPPOSING THE USE OF THE COLLBRAN FORMULA AND EXCESSIVE SUBSIDIES TO IRRIGATION

RESOLUTION NO. 8.—INTEREST COMPONENT—COLLBRAN FORMULA

Whereas the American Public Power Association, composed of the principal locally owned public power systems of the United States, has a direct concern in the standard of financial operations established for Federal power projects, as any public discredit resulting from uneconomic Federal power policies reflects in a degree upon the locally owned public power systems; and

Whereas the American Public Power Association disapproves the Federal power practice of diverting from the Federal Treasury the interest component of revenues derived from the power investment portion of Bureau of Reclamation projects, and using the interest so collected for retirement of capital amounts invested in irrigation projects instead of for paying interest on the resulting national debt; and

Whereas the Collbran formula proposed by the Bureau of Reclamation indirectly effects the same result, by postponing the commencement of repayment of the irrigation investment until the power investment is first retired, and is equally unsound; and

Whereas in the aggregate the sums involved in diversion of the interest component and Collbran formula would require the replacement through added taxes of many billions of dollars for the numerous reclamation projects now proposed, and

Whereas this association has been on record since 1946 as not opposing a reasonable subsidy to irrigation from power revenues, but insists as a matter of principle and sound economics, that any irrigation subsidy believed to be in the public interest should be clearly set forth and be specifically recognized and approved as such in authorization of the project by the Congress; and

Whereas as stated in this association's statement of power policy, total capital costs paid from power revenues shall not exceed the amount for which a comparable supply of power could have been developed had irrigation not been one of the purposes of the project: Now, therefore, be it

Resolved, That the American Public Power Association condemns these practices and recommends that they not be employed in future Reclamation Bureau projects. This recommendation is made in the best interests of the American taxpayer, of the public power industry, and of the public it serves. Adoption of such a reform would avoid a concealed subsidy, the benefits of which go to only a limited number of persons at the expense of the Federal Treasury.

RESOLUTION NO. 8 (A)—EXCESSIVE SUBSIDIES TO RECLAMATION

Be it resolved. The American Public Power Association is opposed to the increasing burden which is being placed upon the power users in order to subsidize irrigation projects. In some projects recently proposed by the Bureau of Reclamation the irrigators are required to pay less than 15 percent of the costs allocated to irrigation, and the power users are required to pay more than 85 percent thereof plus all the costs allocated to power. In other cases the subsidy to be exacted from the power users would amount to the equivalent of nearly \$100,000 for each 160-acre farm. This practice is not in the public interest.

This association's declaration of "Federal power policy" states that when irrigation is one of the joint purposes of a project, power revenues may be used to pay that portion of the capital costs properly chargeable to irrigation which is beyond the ability of the irrigators to pay, but that the total capital

costs to be paid from power revenues shall never exceed the amount for which a comparable supply of power could have been developed had irrigation not been one of the purposes of the project. This formula concedes fair and adequate subsidies to irrigation from the power users. If a reclamation project is sufficiently meritorious to justify greater subsidies, they should be fully disclosed, and paid from the general treasury.

(Copied from Public Power, vol. 12, No. 6, dated June, 1954.)

CITY OF SAN JACINTO

RESOLUTION NO. 448—A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SAN JACINTO, RESPECTING SENATE BILL 1555 AND H. R. 4449 IN RESPECT TO STORAGE WATER PROJECTS IN THE COLORADO RIVER BASIN

Whereas the city of San Jacinto is vitally dependent on a water supply obtained from the Colorado River;

Whereas the Colorado River storage project as proposed in S. 1555 and H. R. 4449 and the Fryingpan-Arkansas project as proposed in S. 964 and H. R. 236, now pending in the Congress, would jeopardize the water rights and the water supply of the city of San Jacinto;

Whereas the aforementioned projects would inflict on the taxpayers of this city and the Nation an unjustifiable burden: Therefore be it

Resolved, That the enactment of these project bills is against the interest of the city of San Jacinto and should be opposed; and be it further

Resolved, That the city of San Jacinto respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of the above-mentioned bills or any similar legislation.

Moved, passed, and adopted at a special meeting of the City Council of the City of San Jacinto, a California municipality, duly called and held on June 30, 1954.

Dated June 30, 1954.

W. M. KOLB,
Mayor, City of San Jacinto.

Attest:

MARGARET D. BELTZNER,
City Clerk, City of San Jacinto.

RESOLUTION No. 54-91—EXPRESSING OPPOSITION TO H. R. 4449

Whereas the city of Santa Ana, Calif., is vitally dependent on a water supply obtained from the Colorado River;

Whereas the Colorado River storage project bill (H. R. 4449), now pending in the Congress, would jeopardize the water rights and the water supply of the city of Santa Ana;

Whereas the Colorado River storage project would inflict on the taxpayers of this city and the Nation an unjustifiable burden: Therefore be it

Resolved by the City Council of the City of Santa Ana, That the enactment of the Colorado River storage project bill is against the interests of the city of Santa Ana and the county of Orange and should be opposed; be it further

Resolved, That the city of Santa Ana respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of this bill or any similar legislation.

Passed and adopted by the City Council of the City of Santa Ana at its regular meeting held on the 21st day of June 1954.

COURTNEY R. CHANDLER, *Mayor.*

Attest:
[SEAL]

ERMA KEELER,
Clerk of the Council.

RESOLUTION No. 2595

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TORRANCE OPPOSING S. 1555 AND H. R. 4449 AND THE FRYINGPAN-ARKANSAS PROJECT AS PROPOSED IN S. 964 AND H. R. 236, NOW PENDING IN THE CONGRESS

The City Council of the City of Torrance does resolve as follows:

Whereas the city of Torrance is vitally dependent on a water supply obtained from the Colorado River; and

Whereas the Colorado River storage project as proposed in S. 1555 and H. R. 4449 and the Fryngpan-Arkansas project as proposed in S. 964 and H. R. 236, now pending in the Congress, would jeopardize the water rights and the water supply of the city of Torrance; and

Whereas the aforementioned projects would inflict on the taxpayers of this city and the Nation an unjustifiable burden: Now, therefore, be it

Resolved by the City Council of the City of Torrance, That the enactment of these project bills is against the interest of the city of Torrance and should be opposed; be it further

Resolved, That the City Council of the City of Torrance respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of the above-mentioned bills or any similar legislation.

Introduced, approved, and adopted this 29th day of June 1954.

NICKOLAS O. DRALÉ,
Mayor of the City of Torrance.

Attest:

A. H. BARTLETT,
City Clerk of the City of Torrance.

RESOLUTION No. 541—A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF HEMET, RESPECTING SENATE BILL 1555 AND H. R. 4449 IN RESPECT TO STORAGE WATER PROJECTS IN THE COLORADO RIVER BASIN

Whereas the city of Hemet is vitally dependent on a water supply obtained from the Colorado River;

Whereas the Colorado River storage project as proposed in S. 1555 and H. R. 4449 and the Fryngpan-Arkansas project as proposed in S. 964 and H. R. 236, now pending in the Congress, would jeopardize the water rights and the water supply of the city of Hemet;

Whereas the aforementioned projects would inflict on the taxpayers of this city and the Nation an unjustifiable burden: Therefore be it

Resolved, That the enactment of these project bills is against the interest of the city of Hemet and should be opposed; be it further

Resolved, That the city of Hemet respectfully requests the representatives of the State of California in the Congress of the United States to oppose the enactment of the above-mentioned bills or any similar legislation.

Moved, passed, and adopted at a special meeting of the City Council of the City of Hemet, a California municipality, duly called and held on July 2, 1954.

Dated July 2, 1954.

JAMES S. SIMPSON,
Mayor, City of Hemet.

Attest:
[SEAL]

MARY E. HENLEY,
City Clerk, City of Hemet.

A RESOLUTION OF THE COUNCIL OF THE CITY OF GLENDALE OPPOSING PENDING LEGISLATION AUTHORIZING COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

Whereas the city of Glendale is vitally dependent on a water supply obtained from the Colorado River; and

Whereas the Colorado River storage project as proposed in S. 1555 and H. R. 4449 and the Fryngpan-Arkansas project as proposed in S. 964 and H. R. 236, now pending in the Congress, would jeopardize the water rights and the water supply of the city of Glendale; and

Whereas the aforementioned projects would inflict on the taxpayers of this city and the Nation an unjustifiable burden: Now, therefore, be it

Resolved by the Council of the City of Glendale, That the enactment of these project bills is against the interest of the city of Glendale and should be opposed, and that the Council of the City of Glendale respectfully request the representatives of the State of California in the Congress of the United States to oppose the enactment of the above mentioned bills or any similar legislation; and be it further

Resolved, That the city clerk be and is hereby instructed to transmit copies of this resolution to the Senators and Representatives of the State of California in the Congress of the United States.

I, G. E. Chapman, city clerk of the city of Glendale, do hereby certify that the foregoing is a true and correct copy of resolution adopted by the Council of the City of Glendale, Calif., on the 24th day of June 1954.

[SEAL]

G. E. CHAPMAN,
City Clerk of the City of Glendale.

THE RAILROAD BROTHERHOODS
JOINT LEGISLATURE COUNCIL OF CALIFORNIA,
Los Angeles, Calif., June 21, 1954.

MY DEAR MR. CONGRESSMAN: The Railroad Brotherhoods Joint Legislative Council of California, after due consideration of the effects of the enactment of the Colorado River storage bill (H. R. 4449), feel that the enactment of this legislation would not be in the public interest, and I am therefore directed to advise you of the position of our membership as outlined in the following resolution setting forth our position on this matter:

Whereas the Railroad Brotherhoods Joint Legislative Council is vitally interested in any legislation affecting the welfare of the citizens of this country; and

Whereas the Colorado River storage project bill (H. R. 4449), now pending before the Congress, would impose upon all American taxpayers an enormous additional burden; and

Whereas the economy of the Nation would be seriously impaired by construction of this expensive and unjustifiable project: Now, therefore, be it

Resolved, That the Railroad Brotherhoods Joint Legislative Council vigorously opposes passage of H. R. 4449 by the Congress;

And we further urge that you do all possible to prevent this legislation from being enacted.

Adopted June 21, 1954, by the legislative representatives of the several organizations of the Railroad Brotherhoods Joint Legislative Council of California, upon behalf of the organizations and the membership thereof.

LEROY H. MORGAN,
Chairman, Railroad Brotherhoods Joint Legislative Council of California.

(Whereupon, at 6:35 p. m., the committee was recessed, to reconvene at 9 a. m. the following day, Saturday, July 3, 1954.)

COLORADO RIVER STORAGE PROJECT

SATURDAY, JULY 3, 1954

UNITED STATES SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS,
Washington, D. C.

The subcommittee met, pursuant to recess, at 9 a. m., in room 457, Senate Office Building, Senator Arthur V. Watkins presiding.

Present: Senator Arthur V. Watkins, Utah.

Present also: Elmer K. Nelson, staff consulting engineer, and N. D. McSherry, assistant chief clerk.

Senator WATKINS. The subcommittee will be in session.

Mr. Matthew will be the first witness.

STATEMENT OF RAYMOND MATTHEW, CHIEF ENGINEER, COLORADO RIVER BOARD OF CALIFORNIA

Mr. MATTHEW. My name is Raymond Matthew. I am chief engineer of the Colorado River Board of California. I appear here on behalf of the Colorado River Board of California, which is a State agency created by act of the legislature in 1937. The board is charged with the responsibility for protecting the interests of California in the waters of the Colorado River. It is composed of 6 members appointed by the Governor, each representing 1 of the public agencies having established rights to the use of water or power from the Colorado River.

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. It is the duty of the State to protect and preserve those rights of its citizens. California is, therefore, rightfully concerned in proposals for the further development of the water resources of the Colorado River Basin wherever such development may be. For this reason, it is necessary for the State to analyze thoroughly any proposals for further development and take whatever steps appear required to insure that such developments would not impair the rights of California and its agencies in and to the waters of the Colorado River system.

California favors the continuation of the development of the water resources of the Colorado River Basin on a sound economic basis as the need for such development occurs. This State recognizes the right of the upper basin States to so utilize the waters apportioned to that basin by the Colorado River compact as approved by the Boulder

Canyon Project Act, but subject to the terms and conditions of those documents as the Supreme Court may construe them in the case of *Arizona v. California*, now pending.

By the same token, California, in the protection of its investment of nearly \$700 million in water-development projects which it has made in reliance upon the Colorado River compact and the Boulder Canyon Project Act, and the economy and population of more than 4 million people dependent upon these works, must resist legislation which would encroach upon the rights recognized in the lower basin States by those documents.

The Colorado River Board of California opposes the enactment of S. 1555 to authorize the Colorado River storage projects and participating projects, for the following reasons:

1. The plans for construction and operation of the projects as proposed in the bill and set forth in the reports of the Bureau of Reclamation would adversely affect to a material extent the rights of California agencies to Colorado River Water, which have been established by prior appropriation and by contract with the Secretary of the Interior under the Boulder Canyon Project Act.

2. The feasibility standards and the financial plan proposed for the developments depart materially from existing reclamation law of general application, and are unsound from the standpoint of national public interest.

It is understood that the projects and the units and features of projects specified in the bill are those reported upon by the Bureau of Reclamation in Project Planning Report No. 4-8A.81-1, dated December 1950, and entitled "Colorado River Storage Project and Participating Projects" (referred to in sec. 10 of S. 1555), supplemented by a number of special reports on participating projects.

The Secretary of the Interior and the Commissioner of Reclamation have prepared supplemental reports (transmitted to the President on December 10, 1953) which supersede and modify these previous reports in a number of particulars, including cost estimates and program of repayment. However, the original planning report is incorporated, with modifications, in the supplemental reports referred to and still constitutes the only source of basic engineering studies. These Bureau of Reclamation reports collectively contain all of the original basic data and studies on engineering, financial, and legal aspects of the proposed developments.

The bill before the committee does not conform to either the original project planning report of December 1950, or the more recent supplemental reports referred to. The Secretary now recommends authorization at this time of only 2 out of 10 of the originally proposed storage units; namely, Glen Canyon and Echo Park, and conditional authorization of some 11 participating projects.

The pending bill would authorize several more initial units of the storage project and participating reclamation projects, and it now appears that several additional projects are or will be proposed for authorization. Furthermore, the bill, H. R. 4449, reported by the House Committee on Interior and Insular Affairs, the provisions of which were completely revised in response to suggestions by the Secretary of the Interior and the Bureau of the Budget, differs materially from S. 1555. It is uncertain, therefore, just what is or will be the proposal before the committee.

However, it is understood that a progressive plan of development is envisaged that would have as its final objective the construction and operation of storage units and of participating reclamation projects to consumptively use up to 7,500,000 acre-feet annually of the Colorado River system waters apportioned to the upper basin under the Colorado River compact. The Colorado River Board of California is therefore especially concerned with the overall development as ultimately projected, particularly in respect to its effect upon and relation to the water supply available to the lower basin and particularly to California.

WATER SUPPLY AND USE

The engineering studies of water supply and use in the project planning report are vague and uncertain, involving or implying what are considered to be erroneous interpretations of the Colorado River compact, and do not clearly show what the effect of the proposed developments will be on the water supply and operations in the lower basin. The studies are directed almost entirely to estimates of the flow of the Colorado River at Lee Ferry and depletion of that flow by upstream use.

The erroneous interpretations of the compact include: (1) that article III (a) apportions to the upper basin a water use of 7,500,000 acre-feet a year in terms of depletion of the virgin flow at Lee Ferry instead of a beneficial consumptive use of 7,500,000 acre-feet a year at places of use; (2) that the upper basin would be entitled to the consumption use of an average annual amount of 7,500,000 acre-feet of apportioned water instead of a maximum of 7,500,000 acre-feet in any one year. Coupled with the foregoing, the assumption is made that the irrigation water requirement would be highest in wet years and lowest in dry years, which appears to be an unreasonable and illogical premise.

Furthermore, the Bureau appears to assume, insofar as the lower basin is concerned, that the storage reservoirs could and would be operated primarily to satisfy the obligation under article III (d) of the Colorado River compact, which requires that the flow at Lee Ferry shall not be reduced below 75 million acre-feet in any consecutive 10 years. This apparently reflects the general view of representatives of the upper basin States that the only obligation of the upper basin to the lower basin under the compact is that required by article III (d). This view is based upon a misconception of the compact. The lower basin States are entitled to receive at Lee Ferry all waters of the Colorado River system over and above the compact apportionment of 7,500,000 acre-feet for consumptive use in the upper basin. Estimates of available water supply for the lower basin have been predicated upon this basis, indicating an expectation of an average annual water supply at Lee Ferry at 8.5 to 9 million acre-feet. Rights thereto long since have been established by appropriation and by contract in the lower basin.

Estimates in the report (p. 62) of the ultimate depletion at Lee Ferry by upstream use range from 4,480,000 acre-feet in a year such as 1934, the driest on record, to 9,530,000 acre-feet in a year such as 1917, the year of greatest recorded streamflow, and average 7,500,000

acre-feet annually for a period such as 1914-45. Under proper interpretation of the compact, the maximum ultimate consumptive use of water apportioned by article III (a) of the Colorado River compact in the upper basin would be not more than 7,500,000 acre-feet in any one year, measured at places of use.

The 7,500,000 acre-feet of maximum permissible consumptive use of apportioned water at places of use would limit and thus determine the area that could be permanently developed for irrigation, after due allowance for reservoir losses chargeable to consumptive use. Assuming no shortages of water, the actual irrigated acreage that could be served permanently would be determined by the estimated consumptive use requirements per acre in the year of maximum requirement. Consequently, if the irrigated acreage remained substantially the same, as limited by the year of maximum requirement, the consumptive-use requirements in all other years, and hence the long-time average, would necessarily be less than 7,500,000 acre-feet a year.

As to annual variation in consumptive-use requirements, there appears to be no justification for the assumption in the report that, under full development with a regulated water supply and with practically all the irrigated land receiving a full supply each year, the water requirement and use would be highest in wet years and lowest in dry years. This assumption apparently stems from the erroneous concept that consumptive use of irrigation water depends solely upon the relative availability of streamflow. Investigations by the United States Department of Agriculture demonstrate that consumptive use varies with temperature, precipitation, wind movement, soil conditions, and other natural phenomena, and is likely to be higher in dry seasons than in wet seasons.

Based upon the application of the United States Department of Agriculture formula for determining consumptive-use rates, and assuming that local project storage facilities could and would be provided in aggregate quantity sufficient to regulate the water supply to the requirements of the ultimate irrigated acreage; and further assuming some permissible shortage in supply during years of maximum requirements, it appears that the average annual consumptive use of apportioned water, that would be possible under conditions of ultimate development in the upper basin, will be substantially less than 7,500,000 acre-feet a year as a long-time average.

The maximum permissible use in any one year in the upper basin under the compact apportionment under article III (a) would be 7,500,000 acre-feet, and any water used in excess of 7,500,000 acre-feet per annum would be surplus water under the compact, to which rights and obligations are now attached in the lower basin and for Mexico under the Mexican Water Treaty.

The indicated combined effect of assumptions predicated upon erroneous interpretations of the compact, on which the Bureau's engineering studies of water supply and use and reservoir operation are based, is to reduce the water supply, which the lower basin States expect and are entitled to receive at Lee Ferry under the compact, by about 1,500,000 acre-feet as a long-time average.

Quality of water: Of equal concern to quantity is the matter of quality of water. This is a problem which concerns water users throughout the basin but especially those in the lower basin. No information is presented in the project planning report concerning the

present or future quality of water at either places of use in the upper basin, or delivered to the lower basin at Lee Ferry.

Regional Director E. O. Larson, in his statement made to the House committee on January 18, said:

Careful study of all available data shows that the depletion resulting from all the projects contained in the bill would have no appreciable effect on the quality of the streamflow passing Lee Ferry.

In response to questions Mr. Larson and his assistant subsequently stated that their study showed that the increase in salt content resulting from the operations of the proposed initial projects (Glen and Echo and 12 participating projects including Shiprock) was estimated at 12 percent. Whether such an increase is appreciable or not is a question of judgment.

In response to a question by Congressman Craig Hosmer, the Secretary of the Interior, on May 14, 1954, reported that under full development in the upper basin, a—

very preliminary study indicates that with a repetition of the critical 1931-47 period the mean concentration of total dissolved solids (at Lee Ferry) would be 1.20 tons per acre-foot (880 parts per million).

Considering the corresponding salinity in the lower Colorado River might be at least 25 percent greater, approaching a salt concentration that would make the water supply of questionable quality for irrigation, this preliminary study points up the seriousness of this problem. It appears to have been overlooked in the Reclamation Bureau's planning in the past, but can be no longer ignored.

It is the position of the Colorado River Board of California that the Colorado River compact intends that water available for use in the lower basin shall be suitable in quality for all necessary purposes. This is required by article VIII of the compact, which provides:

Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact.

Certainly this means unimpaired as to quality as well as quantity.

It is further the Board's position that authorization of additional projects involving large-scale consumptive use of water from the upper Colorado River system be deferred until satisfactory evidence is presented that there will not be a harmful effect on the quality of water available for use in the lower basin.

EFFECT OF UPPER BASIN PROJECT OPERATIONS ON LOWER BASIN

The Bureau's project planning report of December 1950, contains only brief and vague allusions to the lower basin, and to the possible effects of the plan of operation of the proposed reservoirs upon the available water supply and the operations of the reservoirs and powerplants in the lower basin. It is evident that the filling of the proposed reservoirs with an ultimate capacity of about 48 million acre-feet would have a material effect upon the lower basin facilities and operations. Even the filling of the reservoirs proposed in the bill for initial authorization with the combined capacity of 38.5 million acre-feet would have a material effect and would present serious problems.

Insofar as information in the report is concerned, it appears that during the assumed 20-year filling period, at least 48,555,000 acre-

feet of water in addition to reservoir evaporation losses estimated at 9,730,000 acre-feet, or a total of about 58,290,000 acre-feet, would not be available during that period for the production of power at lower basin installations or to meet consumptive-use requirements and the Mexican Treaty obligations.

A major part of the water and power thus lost to the lower basin would never be recovered, since a large part of the water retained in the upper basin during the reservoir-filling period would never reach the lower basin, because of upper basin reservoir losses and because the upper basin reservoirs, once filled, probably would never again be emptied, at least below the dead-storage level (11 million acre-feet). The 58,290,000 acre-feet retained or lost in upper basin reservoirs would amount to an average of more than 2,900,000 acre-feet a year for 20 years. On the basis of the average effective heads at the lower basin power projects and assuming overall efficiencies of 80 percent, it is estimated that the reduction in electrical energy production at the lower-basin plants, that would be caused by retention of that volume of water in the upper basin, would aggregate 62.4 billion kilowatt-hours.

Assuming that such a potential loss of output would be valued at only 3 mills a kilowatt-hours, the total loss involved to the Government would be about \$187 million. Any substantial loss in power output in the lower basin would greatly aggravate the problem of meeting the power demands in that region. This potential loss in lower-basin power output and revenues is significant and should be evaluated and taken into account in the appraisal of benefits and costs of the upper-basin project. That has not been done.

In addition, the lower basin would be materially affected by the apparent assumption in the Bureau's studies of upper basin operations that the only obligation required to be met at Lees Ferry would be the delivery of 75 million acre-feet in any consecutive 10-year period. If during the filling period of upper basin reservoirs or during subsequent operation, the flow were to be reduced at Lees Ferry to an average of 7,500,000 acre-feet annually for several years, the firm power output at Hoover Dam would be reduced about 25 percent. The output of other downstream powerplants would also be reduced similarly. It does not appear that proper consideration has been given to this situation which involves contractual obligations with power users throughout the lower basin States, who are depending on obtaining full power output from these lower basin plants to meet their power demands. Provision should be made for proper safeguards to assure delivery at Lees Ferry at all times of sufficient water for maintaining full firm power production at Hoover Dam and at other plants downstream.

Furthermore, if under such assumed operation water were used or withheld in the upper basin in excess of the apportionment of 7,500,000 acre-feet for consumptive use in any one year, such would be surplus water under the compact, to which rights and obligations are now attached in the lower basin and for Mexico under the Mexican water treaty. It appears that proper consideration has not been given to these established rights and obligations for surplus water in the lower basin.

ECONOMIC AND FINANCIAL ASPECTS

Ostensibly, the primary purpose of the Colorado River storage project, as set forth in the Bureau's project planning report, would be to so regulate the runoff of the Colorado River system above Lees Ferry as to permit full utilization of the 7,500,000 acre-feet per annum of consumptive use of water apportioned to the upper basin by article III (a) of the Colorado River compact, and at the same time assure that, under article III (d), the flow of Colorado River at Lees Ferry would not be depleted below 75 million acre-feet in any 10 consecutive years.

However, the Colorado River storage project appears to be basically a hydroelectric power project. The only showing of economic justification in the report is based solely on power revenues. Considered in this light, the financial feasibility of the storage project appears open to question for several reasons. Repayment of the reimbursable construction costs within the periods and at the power rates proposed would depend entirely upon: (1) allocation of a large portion of the construction cost to irrigation on an interest-free basis; (2) postponement of the starting of repayment of the irrigation allocation for about 50 years; and (3) subsidization of the more costly power units with surplus power revenues earned by the least costly Glen Canyon power unit.

No clear and adequate justification is shown in support of the allocation of a large part of the cost of the dams included in the storage project to irrigation. Justification for such allocation to irrigation would apparently depend upon the future authorization of projects for consumptive use of water in the upper basin. Only minor use could be made of the regulatory reservoirs of the storage project directly for water-consuming projects. Future irrigation projects as a rule would require individual storage facilities.

The one reason given for the proposed allocation to irrigation on the storage project is that the storage units would provide holdover capacity so that the upper basin can proceed with the development and use of water without violating the Colorado River compact. Information in the basic report shows that at the present and anticipated future rate of the upper basin development, Glen Canyon Reservoir alone would suffice for this purpose for 40 to 50 years hence. Furthermore, it appears that the additional consumptive use estimated for the participating reclamation projects proposed for initial authorization by the Secretary could be made even without Glen Canyon Reservoir.

Of all the proposed units of the storage project, the Glen Canyon Reservoir and power development is the only one that can clearly stand on its own feet as a financially sound project unit. Analyses indicate that the cost of power from most of the other proposed units of the storage project, considered individually and on the basis of either the total cost or the power allocations alone, would be greater than the proposed selling price, and that, in fact, power revenues from the Glen Canyon unit would have to subsidize most, if not all, of the other storage units in addition to subsidizing participating irrigation projects. It appears questionable, therefore, whether other storage units would be justified or needed, from the standpoint of either the holdover storage requirements or the value of the power

produced, now or for many years in the future. In view of the large evaporation losses involved which would reduce the available water supply for present economic uses downstream, storage units should not be built in the upper basin in advance of their need in connection with consumptive use projects.

It is evident that the primary purpose of the storage units proposed for initial authorization would be to provide a source of revenue (which, however, would not be available for 45 to 50 years) to finance a major portion of the cost of the participating irrigation reclamation projects. None of the participating projects recommended for initial construction would be in themselves financially sound. On the average the water users would be able to pay only about 15 percent of the irrigation investment ranging from \$200 to \$800 an acre on the 11 initial participating projects.

Under the proposed program and method of financing, it appears that justification of the initially proposed participating irrigation projects and future decision to build additional participating irrigation projects would depend not so much upon the merits of the individual projects as upon the availability of revenues, 50 or more years in the future, from power projects generally unrelated thereto physically.

It is proposed by the Secretary and provided in the bill that the portion of the irrigation costs of participating reclamation projects beyond the ability of the water users to repay (about 85 percent of the total) would be repaid from net power revenues of the storage units, after repayment was completed on the power investment of the storage units. According to financial operation studies made by the Bureau of Reclamation, a period of about 45 to 50 years or more would be required to repay the power investment with interest at 2½ percent, at the proposed power rate of 6 mills per kilowatt-hour. Thereafter, under the proposed repayment program, net power revenues would be devoted to repaying, without interest, the costs of the storage projects allocated to irrigation and the major portion of the irrigation investment of participating projects.

Thus, the proposed repayment program, if adopted, would involve the postponement of starting the repayment of the costs allocated to irrigation on the storage units and on a major portion of the irrigation costs of the participating projects, for a period of about 50 years. These irrigation costs for which repayment would be deferred would comprise, according to Bureau estimates, a minimum of about \$268 million, for the projects recommended for initial authorization by the Secretary and about \$375 million with inclusion of the Navaho project.

It is recognized that the provision, under existing law, of interest-free money for irrigation reclamation projects involves a substantial subsidy from the Federal Treasury which must be borne out of general taxes, comprising the cost of interest on funds advanced. This interest subsidy, during a repayment period of 40 years under existing reclamation law, would aggregate an amount almost equal to the original capital investment even though the principal be fully repaid in equal annual installments during the 40-year period.

Considering the time value of money, the postponement for about 50 years of starting repayment of such a large part of the construc-

tion cost of the proposed development would obviously greatly increase the subsidy from the Federal Treasury in interest costs on the funds advanced, that would have to be paid out of Federal taxes. The accumulated interest charges on the funds borrowed by the Federal Government to defray the costs of the project allocated to irrigation could and would never be repaid from project revenues and would have to be paid out of general taxes even though the capital investments were eventually repaid. The resulting national debt would keep on increasing indefinitely unless or until paid off by general taxes.

The increases in the national debt resulting from the Federal subsidy in accumulated interest charges would be several times the original irrigation investment. Based upon the projects proposed for initial authorization by the Secretary of the Interior, the Federal subsidy in these accumulated interest costs at the end of the overall repayment period set forth by the Bureau of Reclamation (p. 192, House committee hearings, H. R. 4449) would amount to over \$2,500 per acre on the area to be irrigated of 366,000 acres; and would be over \$4,000 per acre with the Navaho-Shiprock project included. As compared to such subsidy, the average value of fully developed irrigated land in these proposed projects is reported to be \$150 per acre.

The proposed financial plan and repayment program for the Colorado River storage project and participating projects constitute a material departure from existing reclamation law. It is not in accord with sound standards and policies for reclamation development, and in the light of the greatly increased Federal subsidy involved is not in the national public interest.

Senator WATKINS. Thank you.

Mr. MATTHEW. Thank you, Senator. I am annexing to my statement a letter dated March 2, 1954, from Assistant Secretary of the Interior Aandahl to Budget Director Dodge, relative to the irrigation allocation on the Echo Park storage unit.

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., March 2, 1954.

Mr. JOSEPH M. DODGE,
*Director, Bureau of the Budget,
Executive Office Building, Washington, D. C.*

MY DEAR MR. DODGE: Members of your staff have been reviewing the Colorado River storage project report and have suggested, in discussion with staff members of the Bureau of Reclamation that the cost of the alternative single-purpose reservoirs for irrigation be discontinued for purposes of cost allocation in order to reflect the fact that the irrigation storage probably will not be actually required for a number of years. This Department recognizes that the suggestion is a refinement of the broad assumptions which the Bureau found necessary to make. Any estimates of the time when the various units of storage will be required for irrigation will necessarily have to be quite arbitrary, but inasmuch as an allowance for time is technically correct, the Bureau of Reclamation has made preliminary estimates of the probable effect of the suggested recalculation based on a deferred period of 25 years. Those estimates indicate that the allocation to power would be increased about \$34 million and a corresponding decrease in the allocation to irrigation. The repayment period for the project would be extended from 44 years to 46 years without any increase in power rates, or the 44-year pay-out period could be retained by increasing power rates from 6 mills to about 6.25 mills.

It is our opinion that since the proposed project would be feasible even with the lesser allocation to irrigation, and since the practical effect of following the technically correct suggestion of your staff would result in relatively little change

in the project pay-out analysis, the report should not be revised for that minor correction. If the storage project is authorized, the suggestion made by your staff can be readily incorporated in definite plan reports prepared in advance of construction.

If your staff feels that additional information on this matter is necessary, the Bureau of Reclamation will be glad to supply such material.

Sincerely yours,

FRED G. AANDAHL,
Assistant Secretary of the Interior.

Mr. ELY. Mr. Chairman, I have a statement here of Samuel B. Morris, of Los Angeles, general manager and chief engineer of the Los Angeles Department of Water and Power, who had planned to be here but is detained. It is relatively short, and with the Chair's permission, I would like to read it.

Senator WATKINS. How long is it going to take?

Mr. ELY. It will take approximately 20 minutes.

Senator WATKINS. You may proceed.

Mr. ELY. Thank you.

Mr. Morris is general manager and chief engineer of the Department of Water and Power of the City of Los Angeles, Calif.

He is a graduate in civil engineering from Stanford University and holds an honorary LL. D. from the University of California. He has had over 40 years' experience in the management of municipally owned public utilities—water, electric, and gas. He served as a consultant to National Resources Committee, National Resources Planning Board, War Department, Bonneville Power Administration, and a number of cities and districts in connection with water-resource developments. For several years he was dean of the School of Engineering of Stanford University. During this period he was chairman of the Board of Public Works of the City of Palo Alto. He served for 3 years as chairman of the American Society of Civil Engineers' committee on cost allocation of multiple-purpose water projects and now represents the American Society for Engineering Education on the engineers' joint council's national water policy panel. He also served on the President's Water Resources Policy Commission in 1950-51. For 8 years he was a member of the Committee on Geophysics and Geography of the Research and Development Board. He is a director of the American Society of Civil Engineers and a member of the American Institute of Electrical Engineers, and a past president of both the American Water Works Association and the American Public Power Association.

STATEMENT OF SAMUEL B. MORRIS, GENERAL MANAGER AND CHIEF ENGINEER, LOS ANGELES DEPARTMENT OF WATER AND POWER, AND MEMBER, COLORADO RIVER BOARD OF CALIFORNIA

Mr. MORRIS. My name is Samuel B. Morris. I am general manager and chief engineer of the Los Angeles Department of Water and Power and a member of the Colorado River Board of California. The department of water and power furnishes water and electricity to all of the 2,125,000 residents of the city of Los Angeles. The department has contracts with the Secretary of the Interior for nearly 18 percent of the firm power produced at Hoover Dam and is one of the agencies which guaranteed to purchase and pay for power if not used by the

States of Nevada, Arizona, and certain other users. It was such contracts with the department and other California agencies which made Hoover Dam and powerplant possible on a wholly reimbursable basis with 3-percent interest in 50 years. The department also operates most of the generating equipment at Hoover Dam as the operating agent of the United States. The department generates power for the States of Arizona and Nevada, the Metropolitan Water District of Southern California, and the cities of Pasadena, Glendale, and Burbank, as well as Los Angeles. Prior to recent withdrawals of power by Arizona and Nevada in accordance with these contracts the department has received about one-half of the power output from Hoover Dam. Accordingly, the Los Angeles Department of Water and Power is deeply interested in the maintenance of its 50-year contracts for purchase of power, which continue until the year 1987.

The department of water and power initiated surveys of an aqueduct from the Colorado River in 1923 and later transferred its surveys and data to the Metropolitan Water District of Southern California. The city represents roughly 50 percent of the population and assessed value of the Metropolitan Water District and is therefore vitally interested in the continued availability of the 5,362,000 acre-feet per annum of water of the Colorado River system under which California agencies have contracts with the United States, and especially of the 1,212,000 acre-feet contract of the Metropolitan Water District, included in the above contracts.

Since 1923 Los Angeles and its department of water and power have looked to the Colorado River and its membership in the Metropolitan Water District having contracts with the United States to assure dependable domestic power supply for its future growth beyond a population of 2 million, which can be met from other water supplies under control of the department, and up to the full maximum contract right of the district of 1,212,000 acre-feet.

In this statement I shall not attempt complete review of the projects which would be authorized by these proposed bills. In fact I do not find in reports and records adequate information to clearly define the total effect of the upper Colorado River storage and participating projects upon the water and power available from already constructed works in the lower basin upon which the more than 4 million people are dependent. I shall discuss only two aspects of the problem: (1) the cost and fiscal arrangement for reimbursement of the Federal Treasury; and (2) the threatened diminution of power and consequent revenues affecting these constructed works on the lower Colorado River, including the Hoover Dam, Davis Dam, Parker Dam, and the Colorado River aqueduct.

Before discussing the cost and fiscal program involved in S. 1555 I should like to state that I have long been interested in fiscal problems related to the construction of multiple-purpose water projects, particularly on our major rivers. Over a near 20-year period I have been a consultant to National Resources Committee, National Resources Planning Board, Bonneville Power Administration; have served as a member of the President's Water Resources Policy Commission; as a consultant to the Bureau of the Budget; and have testified before Congress in opposition to the use of the interest component from power revenues to repay irrigation capital charges. Accordingly, I cannot

refrain from expressing my views in opposition to the provisions of S. 1555. It is noteworthy that the bill is a major departure from existing reclamation law and that it has been introduced into the Congress and is being pressed for passage on the eve of the anticipated report from the Hoover Commission which has been wisely set up by this Congress to report on matters of administration of natural resources in the very field of activity proposed in this bill.

On May 3, 1954, I had the privilege of submitting a statement on water policy to the water resources and power generation task force of the Hoover Commission. In this statement I pointed out that with a national debt approaching \$300 billion, on which the citizens of the Nation are paying interest, I favored the inclusion of interest in determination of the cost on all federally financed or constructed water projects. I also favored 50 years as the maximum period for repayment to the United States. It seems to me that 50 years is a good limiting period for the financial commitments of a family, a State, or the Nation. There will be plenty of demand for capital for public and private investment 50 years from now. The present worth of \$1 due in 50 years at 3 percent interest is less than 23 cents; in 100 years is only 5 cents. Furthermore, economic conditions even during periods well under 50 years are uncertain; beyond 50 years, are quite unpredictable.

S. 1555 provides for the inclusion of so called participation projects to irrigate 370,000 acres of land of which 240,000 acres would receive only a supplemental water supply. In the House minority report computations indicate that interest and capital charges will amount to as high as \$2,500 per acre, whereas fully developed land is worth about \$150 an acre. The bill provides in the average that about 15 percent of the capital cost shall be returned without interest by the irrigators and under the so called Collbran formula some 85 percent of the cost will be returned to the Federal Treasury without interest from power revenues after power has repaid its cost with interest at the average rate of long-time borrowings by the United States. Current interest on long-time Government bonds, I understand, is roughly 2.5 percent.

Under existing reclamation law irrigation projects are authorized under which the irrigation repayments are made in substantially equal installments over a 40-year period after a 10-year development period. Under the Collbran formula approximate equal payments would be made by the irrigators over the 50-year period following a construction period and 10-year development period. However, the 85 percent of the cost to be returned from power revenues would not be returned until after a 40- or 50-year period required to retire the power investment. Consequently there is a tremendous piling up of cost to the general taxpayers of the Nation represented by the interest charges being carried on the irrigation investment before any substantial repayments without interest begin after 40 or 50 years.

The committee may not be fully aware of the tremendous magnitude of the subsidies achieved by the use of this simple technique; that is, construction funds carried without interest over the long periods proposed for these projects.

I believe that a single example—the Navaho project (Shiprock division)—will serve to put the matter in proper perspective.

The total construction costs of this project is estimated to be \$178,825,000, with a construction and development period from 1958 to

1985. (All construction cost and repayment figures with respect to this project are taken from a tabulation introduced with the testimony presented by Mr. W. A. Dexheimer, Commissioner of Reclamation, at a hearing before the Committee on Interior and Insular Affairs of the House of Representatives on H. R. 4449, H. R. 4443, and H. R. 4463. (The table is inserted facing page 192 of the printed report of that hearing.))

Of this cost, some \$13,300,000 is to be repaid by the irrigators, without interest, during the period 1970-2035.

The balance, \$165,525,000, is to be repaid during the period—and I ask that you note carefully the date of the commencement of this period—2020-35.

If we recognize, as we must, that the taxpayers of the United States must pay interest on the public debt and that \$178,825,000 of this public debt will represent money borrowed to construct this project, we reach a rather startling but very realistic result:

If every dollar of repayment anticipated in the estimates of the Bureau of Reclamation is received in full at the time anticipated, then this project will have cost the taxpayers of the United States, in interest at 2½ percent per annum, compounded semiannually, the sum of \$782,393,000, no part of which will ever be returned.

In other words, after full repayment the taxpayers must still bear this burden of \$782,393,000—more than 4 times the total construction cost. Such is the inexorable effect of the necessity of paying interest on borrowed capital—an effect which every man financing or operating a business, public or private, must recognize and face squarely.

Another sin of concealed subsidy and lack of proper accounting is that different figures are derived by proponents and opponents of such a project. Proper accounting would so define the costs of a project, including interest costs, and spell out the funds to be returned to the United States and the amount of subsidy involved so that opponents and proponents alike would use the same figures. Also, there should then be available proper comparisons between projects in the same State or in various States which would enable determination of the most economical and desirable projects.

Existing reclamation law provides that the standard of feasibility shall be reimbursability. S. 1555 provides that the standard shall be the benefit-to-cost ratio—again a major departure from existing reclamation law. While S. 1555 provides for projects to cost approximately \$1 billion, it initiates a program which the Bureau of Reclamation has estimated to cost at least \$5 billion. This would provide for full beneficial and consumptive use of not to exceed 7,500,000 acre-feet apportioned by the Colorado River compact to the upper basin. Under the Collbran formula which shoulders interest charges onto the general taxpayers for prolonged periods, such method of subsidy would make every conceivable irrigation project feasible, no matter how high the cost. With power revenues continuing a sufficient number of years the cost of any project can be repaid without interest. The taxpayer, however, continues to carry the interest subsidy.

It has been stated by E. O. Larson before the House Interior and Insular Affairs Committee, that Glen Canyon power can be produced for 4.70 mills per kilowatt-hour, retiring all Government investment charged to power, including transmission facilities, in 50 years with

interest. It is a good policy enforced by all public utility rate-fixing agencies that only actual costs shall be included in determining the price of power. It seems to me extremely unwise that the bill should provide the high charge of 6 mills per kilowatt-hour for Glen Canyon power and that this charge should continue not only until complete reimbursement with interest on the power investment but thereafter in order to subsidize irrigation projects continuing 50, 60, or 70, or perhaps 100 years. This continuance of high power charges in spite of the reasonably anticipated reduction in cost of power through atomic energy appears indefensible. There may well be no market for 6-mill power after 50 years.

I might also point out that the United States is offering the "partnership program" under which local public or private agencies would pay the cost of separable power features and contribute to the joint cost of multiple-purpose water projects, thus relieving the Federal taxpayer of making the power investment. It would appear clear under such "partnership program" that a local public or private agency having constructed such powerplant would expect to make no further capital-charge payments after it had retired its bond obligations for construction of such works. We thus have on one hand the "partnership program" project freed from capital charges after retirement of capital and the Colorado River storage project and participating projects continuing on for additional decades of time past repayment of the power capital with rates remaining at the 6-mill charge to subsidize irrigation projects included in S. 1555 and others later to be authorized in decades hence.

An examination of the reports pertaining to the projects in the upper basin to be authorized under S. 1555 will reveal that no specialized report has been made contemplating the initial developments proposed in the bill. A most important consideration on which the information is inadequate is the establishment of a proper program and policy for the filling of the upper basin reservoirs. A variety of programs of water use should be studied in receiving and releasing water and noting their effects on the lower basin powerplants at Hoover, Davis, and Parker.

It is generally impossible to forecast whether the initial filling of these reservoirs will occur during a prevailing wet period of years or a prevailing dry period.

It can be understood that if over 37 million acre-feet of storage plus additional evaporation losses are to be subtracted from the flow to the lower plants, less energy will be generated for that filling period than would have been the case without such filling. This reduction would be spread over a period of many years but would involve a loss of energy of the order of the total generated in lower basin plants in about 6 years. Assuming a filling period of 15 years the energy production would be about 60 percent of normal during this period. Whether this energy loss was secondary energy or further would affect firm energy would depend on the amount of runoff and the duration of the filling period. If the runoff was similar to that experienced during the dry period from 1931-50 the filling period would be greatly extended or else the energy diversion would include a substantial amount of firm energy.

In view of the discussion herein we respectfully urge that S. 1555 be held in committee pending the report of the Hoover Commission

and the definition of accumulation of storage in relation to the Government's existing powerplants and financial commitments therefor in the lower basin.

Senator WATKINS. Thank you.

A resolution adopted by the All-Pueblo Council of New Mexico offered by Senator Anderson will be placed in the record at the conclusion of the testimony offered by the representatives of the State of New Mexico.

(The resolution referred to is as follows:)

RESOLUTION

Whereas for many years the problems of drought at one time and floods at another have plagued the Pueblo Indians and their neighbors in the Rio Grande Valley, and

Whereas the United States has authorized the execution of the comprehensive plan for the Rio Grande Valley looking toward the rehabilitation of the works of the conservancy district and of the river channels which should conserve water and lessen the damage from floods which work has already been undertaken by the Bureau of Reclamation and the Corps of Engineers, and

Whereas, as we look at the river from our long knowledge of it, it is desirable to import water from the San Juan River into the Rio Grande Valley through the San Juan transmountain diversion which can be done without injuring our brothers, the Navahos, who have great need for water development in their own behalf, and

Whereas, in connection with our brothers, the Navahos, it is our belief that the project on the San Juan River in the Colorado Basin, which for them is called San Juan-Shirock-Navaho project should be authorized and building started without delay so that some of their hardships can be alleviated: Now, therefore, be it

Resolved by the All-Pueblo Council, That we urge the Congress to do everything possible to hurry up the work on the comprehensive plan for the Rio Grande Valley so that the full benefits of this fine work can be realized at the earliest possible date; be it further

Resolved, That we wish to express our full support for the San Juan-Shirock project and urge the Congress to authorize it for the benefit of the Navaho Indians and let the work get started without any further delay for it has been long needed; be it further

Resolved, That we support and urge the construction of the San Juan-Chama transmountain diversion to bring water from the San Juan River into the Rio Grande Basin from which we expect to have direct and indirect benefits and the right to participate in the use of the imported water.

MARTIN VIGIL,
Chairman, All-Pueblo Council.

CERTIFICATE

I hereby certify that the foregoing is a true and correct copy of a resolution unanimously passed at a duly called meeting of the All-Pueblo Council held on _____, 1954, at Santo Domingo Pueblo which was attended by official delegates of ____ of the 19 pueblos, duly authorized to act.

JOE HERERRA,
Secretary, All-Pueblo Council.

Senator WATKINS. At this point I will insert in the record a letter from the governors of the upper Colorado River Basin States, a statement of William R. Halliday, from Salt Lake City, Utah, in behalf of the Utah Committee for a Glen Canyon National Park, and a telegram from Hon. J. Bracken Lee, Governor of Utah:

WASHINGTON, D. C., April 28, 1954.

To: The Attorney General and the Department of the Interior.

The governors of the upper Colorado River Basin States of Colorado, New Mexico, Wyoming, and Utah definitely believe that the following five questions

are the issues to be determined in the suit pending between Arizona and California as it pertains to the waters from the Colorado River Basin.

1. How is beneficial consumptive use measured?
2. Is III (b) water apportioned or unapportioned?
3. How are losses from lower basin main stream reservoirs to be charged?

In addition there are two legal questions raised by California, the answers to which should be resolved at the outset. They are:

1. Is Arizona a party to and legally bound by the Colorado River compact of 1922?

2. If Arizona is not a party to the compact, may it now claim and receive any benefits under the California Self-Limitation Act?

The determination of these questions before the taking of testimony would, in our opinion, jeopardize no right of the United States. Instead, it would help the United States. Going beyond these questions will very definitely bring about delays in Colorado River development that can extend for years with great, and in many cases permanent, damage to the economic welfare of our States.

It is of the utmost importance that economic feasibility studies of proposed upper Colorado Basin projects be completed at the earliest possible date and made available to the governors of the upper basin States.

_____,
Governor of Colorado.

_____,
Governor of Utah.

_____,
Governor of New Mexico.

_____,
Governor of Wyoming.

OFFICIAL STATEMENT OF THE UTAH COMMITTEE FOR A GLEN CANYON NATIONAL PARK IN OPPOSITION TO THE PROPOSED GLEN CANYON DAM

It has generally been believed by most Americans that the preservation of our great scenic areas has been safely entrusted to the National Park System and to such conservation groups as the National Parks Association, the Mountaineers, the Sierra Club, and similar organizations. The recent hearings of the Irrigation and Reclamation Subcommittee of the House of Representatives, however, have indicated that this is not the case. During these hearings, the so-called conservationist groups, while bitterly attacking the proposed Echo Park Dam, turned their backs on the far more important damage to the Glen Canyon-Rainbow Bridge National Monument area which would result from the proposed Glen Canyon Dam. We believe and can show that this proposal is contrary to the interests of the people, not only of Utah, but of all America.

Until recent years, the Glen Canyon area was one of the least visited in all America. Even in the days of the Powell and Dellenbaugh pioneer expeditions, 80 years ago, however, Glen Canyon was recognized as the garden spot of the Colorado River, both because of its magnificence and because its lack of rapids renders boat travel within its confines easy and pleasant.

Within recent years, Glen Canyon has been coming into its own. More and more parties of increasing size, in boats of every description from canoes to 35-foot rafts, have been making the trip through the canyon to the extent that 4 separate parties, totaling about 200 persons, were camped at one historic spot last summer. The total number of persons making the trip cannot be even roughly estimated, but it is known that by the middle of April 1954 one guide alone had escorted about 150 persons on his regular \$40 week-long trips—and this before the regular season had even opened.

With increasing recognition of the wonders of the area has come an increasing demand that it be set aside for the enjoyment and inspiration of the people of America. There have even been proposals for an enormous Escalante National Park, to include not only several other scenic canyons of the Colorado, but vast areas of the slickrock country, including several present national monuments. Ours is by no means the first plea for protection of this area, so outstanding that its preservation intact is a national concern. It is a very real manifestation of the increasing surge of opinion among those who have seen Glen Canyon.

Unhappily, most of those who know and love the canyon country were lulled into a sense of false security by the misbelief that the national conservationist groups could be entrusted with the natural heritage of America. When this was disproven at the House hearings, friends of the canyon country, aware of this

deep but unorganized undercurrent of protest, founded the Utah Committee for a Glen Canyon National Park. Without previous political experience, funds, organization, or any such propaganda drive as had been conducted by the proponents of the dam, the Utah committee has amply demonstrated the existence of this sentiment for the protection of Glen Canyon and Rainbow Bridge National Monument. Within a single month, and within a limited circle of acquaintances, the signed support of between 175 and 200 persons personally familiar with the area or otherwise well informed, was readily obtained, thus negating any possible claim that the signers were not informed as to the significance of the petition. Photographic copies of the petition blanks are on file with the Interior Committees of the House of Representatives and the Senate of the United States, and with the Department of the Interior.

It is not the claim of the Utah committee that these represent the majority of the people of Utah. On the other hand, in view of the deliberate campaign of scare propaganda and falsity engineered by the proponents of this dam, there is a distinct possibility that these signatures represent the majority of the people of Utah who are informed as to the actual facts. In any event, local resentment against the proposed Glen Canyon Dam cannot be lightly dismissed. Even if there were not even a single voice "crying in the wilderness," however, the actual facts of this proposed dam and its promotional campaign are so shameful as to command the attention of all America.

For purposes of clarity, a brief review of the unquestioned physical features of the proposed dam is worthwhile. Its location is in Arizona, about 12 miles above Lees Ferry, or 18 miles above Navaho Bridge on which U. S. 89 crosses the Colorado River as it flows through Marble Canyon, about 135 miles north of Flagstaff, Ariz. The proposed lake would extend some 187 miles at its maximum height, nearly all in Utah. It would reach almost to the confluence of the Green and Colorado Rivers, and about 70 miles up the San Juan River toward the famous Goosenecks. It is estimated to store a maximum of 26 million acre-feet, with an annual evaporation loss of 691,000 acre-feet. The length of time it will be usable as a reservoir before being rendered useless by silt is variously estimated at 50 to 200 years, primarily depending on construction of upstream dams.

The original cost of the dam is quoted at \$421,300,000. The Utah committee has been unsuccessful in obtaining a statement of the percentage interest to be charged the unrepaid balance. To obtain the total cost, the arbitrary figure of 2½ percent has been used in the belief that this would be a very conservative figure on a non-Federal project. Paid off over the 44-year period with 2½ percent on the unpaid balance, the total cost has been calculated at \$707,123,967 by Robert Kennedy, a Salt Lake City accountant. This is more than a statistic. This is nearly three-quarters of a billion dollars.

There is grave reason to doubt that even this stupendous sum would be the total eventual cost to the American taxpayers. It is a historic fact that the average cost of federally constructed dams is just about twice the initial estimate. Some have cost five times as much. If the average (190 percent) is taken, this figure for true total cost rises to nearly 1½ billion dollars for this one dam alone.

The plan presently proposed for this Glen Canyon Dam calls for a 580-foot dam at an elevation of 3,127 feet, making the elevation of the top of the dam 3,707 feet, if the figures of the Bureau of Reclamation are to be accepted. A few feet of "freeway" are called for, but everyone familiar with reclamation is aware of the fate of "freeway" when more water is available than can otherwise be held by a storage dam. An excellent example is that of Roosevelt Dam, Ariz., when, in the spring of 1941, Roosevelt Lake thus considerably exceeded its theoretical capacity for several weeks. For this reason, the practical maximum elevation of the lake can be considered as 3,707 feet, regardless of the statements of professional bureaucrats. The significance of this figure will be discussed later.

The Utah committee has a constructive program to present. It is important, however, that the basic beliefs of our committee, representing a significant segment of those familiar with the area, should first be clearly understood.

1. We are wholly in sympathy with the concept of development of the Colorado River in accordance with the proven needs of its basin.
2. We believe that the Glen Canyon-Rainbow Bridge area is worthy of national park status regardless of existence of a threatened inundation.
3. We believe that the final boundaries of this national park should be determined by the National Park Service. We are suggesting for consideration a 5-mile strip on each side of the Colorado River from Hite to Lee's Ferry, with a similar strip extending up the San Juan River to Mexican Hat, together with prolongations to include Rainbow Bridge, Aztec Canyon, the cliff dwellings of

Lake and Moqui Canyons, and elsewhere as determined by the National Park Service.

4. We believe that development of oil and gas, uranium, and other mineral claims should be permitted within this national park on the same basis as in Kings Canyon National Park, and that small dams, primarily for silt control, be permitted within its boundaries, if of such nature as to cause no significant damage to the area.

5. We believe that this national park should be rustically developed for an immediate goal of several thousand visitors per year, with an eventual goal of many times this figure. With proper rustic development, maintenance costs can be kept incredibly low.

6. We believe that elimination of, or substitution of other sites for Glen Canyon Dam site will considerably further the cause of the development of the Colorado River by eliminating the highly controversial features of the latter without hampering development of the river.

The great glory of Glen Canyon is its red sandstone walls, rising sheer out of the mighty Colorado, and magnificently offset by its restful green side canyon depths. At the dam site, the walls rise "only" 750 feet, in the term of the *Deseret News*, and this is about their average height. While in a few places considerably lower, as at Hite, they rise a breathtaking vertical 2,000 feet at the Tapestry Walls, and the Straight Cliffs tower 4,000 feet above the river. These, however, are mere statistics. Only those who have experienced the majesty of the lonely river, dwarfed by its brilliant surroundings, can fully understand the fanatical devotion of those who have seen the green glens, the invitingly cool, fern-draped pools in the side canyons, and the supreme spectacle of the incredible stone rainbow of Nonnezoshie, the bridge that was holy to the Indians. It is easy to summon strong factual support for a Glen Canyon National Park, but among the canyons themselves the facts dwindle into insignificance along with one's perspective of size and space.

The facts, nevertheless, are of the utmost importance. The recognition of Glen Canyon as the portion of the river for rest and relaxation by even the earliest explorers has been mentioned. Glen Canyon is simply the only stretch of the Colorado River's canyon country which is free from rapids, and hence is open to everyone of the increasing millions of Americans with a boat. This does not mean that the river is any less powerful in Glen Canyon. It means only that adequate supervision to insure the use of merely reasonable precautions is worth while.

Feasibility alone should thus be sufficient reason for the protection of Glen Canyon. On the other hand, Glen Canyon is regarded by most of those who have seen both areas as far superior to the canyons of Dinosaur National Monument which have recently received such dramatic publicity, and as second only to the Grand Canyon itself. This challenging statement is fully corroborated by the experience of Mac Ellingson, who has guided more persons on more canyon country rivers than any other person known to the Utah committee. It is not his personal judgment. It is that of the hundreds whom he has guided, and who have come away intrigued by the great canyons of the Green and Yampa Rivers, but awed by the surpassing majesty of Glen Canyon.

Numerous historic sites of major significance are doomed if the proposed Glen Canyon Dam is constructed. The famous Hole-in-the-Rock Crossing, where doughty Mormon pioneers spent months carving steps in the sheer rock of a narrow crevice to blaze a new route through the wilderness for wagons and cattle, will be submerged. The Crossing of the Fathers, used by padres who first explored this region while it was still an unknown part of Mexico, will be lost. Music Temple, whose cathedral-like arching walls and cool yet sunlit depths created a near-sacred spot to the early explorers, is doomed. Signature Wall, in its fern-splashed alcove where no modern vandal has added his trivial inscription to the brave early names: C. Powell, Dellenbaugh, Bishop, Steward, and the rest, too, will be deeply submerged. All these and many more will be forever lost if this dam is permitted to inundate Glen Canyon.

The scientific and economic significance of Glen Canyon is just beginning to be realized. While the characteristic formations which comprise its mighty walls have been honored with the specific name of "the Glen Canyon Group," details of the area's geology are but tantalizingly known. The presence of uranium is likely. At least one productive oil well would be submerged. Archeological findings in the side canyons of Glen Canyon are, similarly, just beginning to be appreciated, but appear to be of extreme significance. Due to their isolation, they have not been subjected to the vandalism which renders

fruitless many studies in more accessible areas. The ruins in Lake Canyon are famous in closed scientific circles. The remarkable Indian rock carvings of Newspaper Rock can well lay claim to being America's very finest petroglyphs. Biological studies of the area, even though a natural corridor between major faunal areas, are yet practically nonexistent. All this will be lost without protection from inundation.

The widely differing explanations of the value of a dam in Glen Canyon are indicative of the deplorable nature of the campaign so effusively and expensively waged by the proponents of this dam. Residents of Utah, especially its southern portion, have been led to believe that this dam will supply water to southern Utah and northern Arizona. Many residents of Utah and especially those of the Uintah Basin have been led to believe that this dam and development of the upper Colorado and central Utah projects are inextricably conjoined. Many Utahans and other Americans have been led to believe that this dam would create a vast lake for recreational purposes which will in no way injure Rainbow Bridge National Monument. None of this is true.

It is our belief that the purposes of this proposed dam have been publically and officially stated as follows:

1. To regulate the flow of the Colorado to insure an adequate flow to the lower basin States under the terms of the Colorado River compact.
2. To establish Utah's right to the stored water, which otherwise would pass to California in "another few years."
3. Power production: 3½ billion kilowatt-hours per year (latest official estimate).
4. Silt control to slow the silting of Lake Mead.
5. Recreation.

It is our belief that none of these arguments is valid, for the following reasons:

CONCERNING THE COLORADO RIVER COMPACT

Article III-A of the Colorado River compact reads as follows: "There is hereby apportioned from the Colorado River system in perpetuity to the upper basin and to the lower basin respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist." Additional portions of this compact, correlated with international agreements, guarantee a portion of this 7,500,000 acre-feet of each basin to Mexico, but this apportionment does not otherwise enter into calculations.

The average flow of the Colorado River at Lees Ferry, based upon Bureau of Reclamation figures from 1931 to 1940, is 10,151,000 acre-feet. Even with the addition of the estimated 1,849,800 acre-feet already beneficially consumed in the upper basin, it is evident that the total flow of \$12,000,800 acre-feet per year falls far short of the amount divided by this compact. Nevertheless, this section indisputably serves to "lay the ghost" of the oft-repeated assertion that the upper basin States will lose all rights on the Colorado in another few years if this dam is not built.

A calculation which is of real interest is that of the result if this reservoir were completely full at the time the upper basin States began to consume their allotted 7,500,000 acre-feet per year. Even ignoring the heavy evaporation loss from this reservoir, with an annual deficit of 3 million acre-feet per year, less than 9 years would be required to completely empty the reservoir, after which it would be of value only in occasional flood years, without any possibility of fulfilling its planned function. This is a very disturbing realization.

There is furthermore an irreconcilable conflict between this paramount article IIIA of the compact and its article IIID. If article IIIA, just quoted, were deleted from the compact, the upper basin States would lose all water rights to the first 75 million acre-feet per decade. As the document now stands, however, there is no statement in the compact designating which shall take precedence in case of conflict. When correlated with the actual flow of the river, therefore, this self-contradictory document can only be considered totally unrealistic. This is a long-recognized fact, stressed at the 1954 Governor's Conference in Washington, and it is acknowledged that the compact must eventually be rewritten. Meanwhile, it is obvious that any calculations based purely upon this pact can in no way indicate the actual scope of the problem.

Unfortunately, the figures offered in support of construction of the proposed Glen Canyon Dam are based on one section, then the other, of this compact.

Since it cannot be considered as a satisfactory document, calculations based upon its mutually contradictory sections cannot be accepted as valid. It is the contention of the Utah committee that before construction of any such fabulously expensive dam be even considered, that a unified, unassailable and non-self-contradictory division of the water of the Colorado River be drawn up, so that Utah and America can judge the actual needs to be met in full development of the intermountain West, rather than mere statistics based on inconclusive and contradictory data. Any other course is an unconscionable waste of hard-earned tax dollars, regardless of destruction or its lack, or of proposed repayment.

Even worse treachery against the American taxpayer becomes evident upon study of the Colorado River compact. This is the biased interpretation by the proponents of this dam of article IIID under which they claim that a Glen Canyon Dam is necessary to insure the unhindered flow to the lower basin of 75 million acre-feet per decade. We have already pointed out that it would serve this purpose for only 9 years after diversion of the guaranteed share of the upper basin, after which it will stand mute and empty most of the time. This represents an expenditure of \$80 million to \$140 million per year of service, which is preposterous when its existence can be rendered unnecessary by a mere stroke of the pen. Even this, however, is not the worst indictment that can be made.

Let us, in order to dramatize the preposterousness of this plan, temporarily grant the falsity that article IIID is the supreme section of the compact, and even grant that before a single drop of water can be diverted by the upper basin States, the 75 million acre-feet per decade must be allowed to flow downstream. If this be granted, the construction of Glen Canyon Dam, together with close restriction of the water use of the upper basin States is indeed indicated. Even so, however, it would be so required only because of an insignificant technicality in the drafting of the compact, more than 30 years ago.

This is because the compact states that the water shall be allowed to flow downstream to the lower basin, rather, to the highest point of diversion in the lower basin, which is the station which is of real significance. To the lower basin, correction of this technicality would make no difference since Lake Mead serves their storage needs, except, perhaps, that their drinking water would not become more salty as the result of evaporation from an additional lake. To the upper basin, it would remove the necessity for justification of futile construction of a billion-dollar dam in the worst possible location—the falsity of its necessity still being assumed. To the American people, it would mean the elimination of an outlay of a billion dollars and the destruction of one of its most superb scenic attractions simply for an unnecessary technicality in a contradictory agreement of no Federal standing. The present situation is an unmitigated offense against every American taxpayer.

Were the Congress of the United States to require by legislation that this technicality be corrected before any appropriation be made for any reclamation project in the basin States, it would be achieved almost overnight, and the need for a Glen Canyon Dam in terms of the Colorado River compact, would be forever excluded. Under these circumstances, if the desirability for a dam and reservoir in this area could be justified, Marble Canyon or other dams could be constructed on their own merits, which greatly exceed those of Glen Canyon Dam. Legally, this may be possible in any event. If they are not justifiable, Lake Mead would continue to serve the storage needs of the lower basin admirably. If the Bridge Canyon Dam were constructed, it, too, could assist in storage.

CONCERNING POWER PRODUCTION

The production of large quantities of power by this dam is undeniable, although estimates have been subject to remarkable variations. The economic use of this power, however, is beyond the judgment of the Utah committee, though we would like to point out that the nearest railroad point is 150 miles away at Flagstaff, which would seem to seriously limit development of industries interested in its use. It is nearly 300 miles from Salt Lake City. In view of the limiting factor of power loss in transmission, the tremendous cost of the dam, and the availability of power from other sources, we believe a careful study of the economic feasibility of this isolated dam must be given close scrutiny before this factor is given serious consideration. It is significant that no one has proposed that this dam be constructed as a power source alone.

CONCERNING SILT CONTROL

That a dam in Glen Canyon would prevent the collection of considerable quantities of silt in Lake Mead is undeniable. It would be retained in Glen Canyon instead. It is hardly justifiable, however, to spend about a billion dollars to accomplish this former worthy goal. An infinitesimal fraction of this sum devoted to much smaller silt control dams on the Little Colorado River, which supplies to Lake Mead half as much silt as the Colorado itself, on the San Juan, and perhaps a few other tributaries, would serve the purpose as well and probably far better without destroying Glen Canyon. If dams are constructed on the Green or Yampa Rivers, these other tributaries become of even greater proportional importance. Proper watershed management at a far smaller cost is also a much more desirable partial solution where applicable, but is not applicable to the slick-rock country, where the silt of the tributaries is largely derived from corrosion of their barren stream sources.

CONCERNING RECREATION AND RAINBOW BRIDGE

The belief that a lake in Glen Canyon would result in a vast recreation area like Lake Mead is one of the most tragic misconceptions associated with the entire project. This is no Black Canyon, where high walls give way to gentle slopes a short distance above Hoover (Boulder) Dam. Sheer walls 200 to 2,000 feet above the water level preclude launching of any boat at the damsite or for miles above along the main canyon, even if roads existed in this incredibly dissected country. The upper end of his proposed lake is even more forbidding. There, Cataract Canyon is inaccessible to man and beast alike. Only one usually passable road, connecting the outposts of Hanksville and Blanding by way of the ferry at Hite, approaches the level of his proposed lake, and the treacherous canyons through which it snakes will be inevitably silted up by the same upstream silting process which has made similar side canyons of Lake Mead totally impassable. The only other access location given public attention was suggested by a resident of Kanab, Utah, in one of the letters to the editor published by the *Deseret News* in this heated controversy. It was his belief that the Lone Rock area in Wahweap Canyon, some 65 miles east of Kanab, could be made accessible by road construction. A jeep road now runs to this point along the streambed of the Paria River, over Clark Bench and down the streambed of Wahweap Creek, but begins at Henrieville, over a hundred miles to the northwest. This jeep road will, of course, be silted up like all the other side canyon floors.

It is true that the cliffs near Lone Rock are less precipitous, and that a man or horse can make his way from the canyon rim to the highwater line. On the other hand, inspection of the Bureau of Reclamation maps of the area indicate why a boat trailer cannot, and this is confirmed by others who have studied Wahweap Canyon.

This proposed lake would indeed be a fine recreation area, but one accessible only by seaplane. This is not a service to the people of America.

It is not necessary to point out to those who have studied the Glen Canyon project proposal that the lake formed by the dam is not destined for any irrigation or culinary use in Utah or northern Arizona, despite the widespread belief to the contrary. It is, however, important to dispel misconceptions of the relation of the proposed dam to Rainbow Bridge National Monument which have even been included in the so-called Fact Sheet circulated by the Department of the Interior.

As previously mentioned, the elevation of the maximum level of the proposed lake is 3,707 feet. According to the figures of the Bureau of Reclamation, this is 53 feet higher than the canyon bed at Rainbow Bridge, which is 3,654 feet above sea level. This dam will result in submergence of the lower end of the National Monument a hundred feet deep.

Parts of Rainbow Bridge National Monument will thus be flooded whenever the lake is within 100 feet of capacity. This, of course, will be no problem when the upper basin States begin to consume their full 7,500,000 acre-feet per year, and the reservoir is standing empty and useless. Meanwhile, if it were possible to float up to or beneath the Bridge, as might be suggested by these figures, little objection could be raised. Unfortunately, it has already been shown that boats cannot be launched on this reservoir, but even were this possible, experience gathered from the varying height of Lake Mead and its silting indicates how extremely rarely the reservoir would be at this maximum height. Actually, silting rather than flooding will be the agent of maximum damage to Rainbow Bridge

National Monument, which is recognized as one of the seven natural wonders of the world. This upstream silting process has already been mentioned. It would be very little affected by alterations of a few dozen feet in the level of such a lake. Even in the opinion of one of the few backers of the plan actually familiar with the area, "after one or two seasons of floods" it will be impossible to reach Rainbow Bridge from either the river trail or the upstream trail from Rainbow Lodge. To continue his statement: "I can predict this with accuracy because the side canyons entering Lake Mead below Separation Canyon are now clogged with heavy deposits of silt. This, likewise, will happen to all of the side canyons of Glen Canyon".

Although no official statement has been made, and its cost nowhere appears in the estimates of the cost of this project, there has been talk of protecting Rainbow Bridge National Monument with a dike or check dam below the National Monument in Bridge or Aztec Canyon. This would, of course, have to be in excess of 100 feet in height, and would be a multimillion dollar project. What is worse, such a dam would cause even more severe backing up of silt into a stagnant quicksand pool behind its barrier, and would thus worsen the problem it was designed to correct. Of the two, the lake is the lesser evil, as a portion of the silt would find its way down the canyon arm into the main lake. Even such proponents of the dam as the Salt Lake Tribune admit that "serious flooding * * * of this truly unique natural attraction would be deplorable." There is no way that severe damage to Rainbow Bridge National Monument by flooding and silting can be avoided under the present terms of the Glen Canyon project.

If a real need for a major dam in this area of northern Arizona is demonstrated in this or later investigations, admirable alternate sites preserving the magnificence of Glen Canyon and Rainbow Bridge National Monument are available in Cataract, Stillwater, Labyrinth and Marble Canyons, and at least the last two of these have already been approved by the Bureau of Reclamation. One is Marble Canyon damsite. A comparison of the two projects is very worthwhile.

Marble Canyon damsite is located about 50 miles downstream from the Glen Canyon damsite. The proposed 300 foot dam here would back water up some distance above Lee's Ferry. Here, in contrast to Glen Canyon, would be a freely accessible, magnificent recreational area with broad sloping beaches just off United States 89. Today an area of fierce, treacherous rapids, in contrast to the broad currents of Glen Canyon, its magnificent canyon would rise far above the lake level and be freely accessible to boats. One beauty spot—Vasey's Paradise—would be lost, but how little this compares with the terrible destruction which would occur in Glen Canyon, where Rainbow Bridge, Music Temple, Lake Canyon, Hole-in-the-Rock Crossing and all its other glorious features would be totally destroyed or heavily damaged.

Power production and water storage are, of course, less because of the lower height of the dam. The former is estimated at 2½ billion kilowatt-hours per year which is about three-fourths of that of Glen Canyon, estimated to produce 3½ billion kilowatt-hours per year. On the other hand, the topography of Marble Canyon strongly suggests that the proportional evaporation would be considerably less, partially balancing the lesser storage. The Utah Committee has been unable to obtain an estimate of the cost of this dam, but is hardly credible that it would exceed the near-billion dollar cost of Glen Canyon Dam.

It is our belief that serious consideration should be given the question of whether these somewhat different storage and power potentials will not be more than adequate, in the event that the desirability of a dam in this general area ever becomes apparent. Such alternate sites, in contrast to Glen Canyon, can be of great value to the people of the Southwest and of America. In the even more unlikely event that an auxiliary dam should ever prove essential, one located at the Glen Canyon damsite which would back water up only to the mouth of Aztec Canyon, thus causing a minimum of destruction, might be further added without the moral indefensibility of the present plan.

The Utah Committee for a Glen Canyon National Park therefore wishes to present the following plan:

1. Establishment of a Glen Canyon National Park with the specifically limited reservations outlined above.
2. Revision of the Colorado River compact before any projects are finalized.
3. Determination of the needs for development of the Colorado River Basin under the revised compact.
4. Construction of silt control dams on the Little Colorado River, the San Juan River and elsewhere, in locations of minimum destructiveness.

5. Construction of a Marble Canyon, Cataract Canyon, Labyrinth Canyon or Stillwater Canyon Dam if the need be proven.

6. Construction of a Glen Canyon Dam limited to a height which would back water up only to the mouth of Aztec Canyon if further need be ever proven.

Finally, it is the belief of the Utah Committee that the evidence against the construction of the Glen Canyon Dam is so strong that the only real reason for its inclusion in the upper Colorado storage project is an underhanded one. If the power from this dam could be sold, and credited to the account of the Echo Park-Central Utah projects, the somewhat vulnerable financial status of the latter would be considerably improved. The frightful destructiveness of this dam is too great a cost to pay for the mere sake of this tainted bookkeeping. Glen Canyon and Rainbow Bridge are fully worthy of preservation and development for the people of America. Let us not allow a costly, destructive, unnecessary dam to destroy their eternal magnificence.

SALT LAKE CITY, UTAH, July 2, 1954.

HON. ARTHUR V. WATKINS,
United States Senate.

Please be assured of my wholehearted support for S. 1555 which authorizes the construction of the Colorado River storage project. Including the Echo Park Dam. This legislation has the support and approval of the overwhelming majority of the people of Utah. The further development and expansion of this State depends in large measure on the approval of this project, which will assure the protection and ultimate beneficial use of our Colorado River water rights. In view of conflicting statements regarding my stand, would appreciate having the foregoing inserted in records of your hearing.

J. BRACKEN LEE,
Governor, Utah.

Senator WATKINS. The hearing will recess subject to further call of the Chair.

There are numerous statements, letters, and telegrams which will be considered by the committee, and such of those which are pertinent will be placed in the record at this point.

NUCLA, COLO., June 30, 1954.

Senator EUGENE MILLIKIN,
United States Senate Building, Washington, D. C.

Local sentiment overwhelmingly in favor of Echo Park Dam project. Exert every effort to gain approval.

P. J. CAMPBELL,
President Nucla Chamber of Commerce.
JOHN S. GILMORE,
Publisher Nucla Forum.

VERNAL, UTAH, June 28, 1954.

Senator MILLIKIN,
Chairman of Echo Park Dam Hearing,
Washington, D. C.

Myton City Lions Club wholeheartedly advise your committee that we endorse the construction of the Echo Park Dam and central Utah project.

LIONS CLUB,
REX LAMB, *President.*

DELTA, COLO., June 29, 1954.

Senator ARTHUR V. WATKINS,
Senate Office Building, Washington, D. C.:

We request outright authorization of projects in Colorado River storage bill and any others included by amendment. Drought conditions are disastrous to the economy of this area. Water storage is our only solution.

DELTA COUNTY WATER DEVELOPMENT COMMISSION.

STATE OF NEW MEXICO, EXECUTIVE OFFICE,
Santa Fe, March 27, 1954.

HON. EUGENE MILLIKIN,
*Chairman, Subcommittee on Irrigation of the Interior and Insular Affairs
Committee of the Senate, United States Senate, Washington, D. C.*

MY DEAR SENATOR MILLIKIN: In view of the letter of March 18, 1954, of the Bureau of the Budget to the Secretary of the Interior regarding the Colorado River storage project and participating projects, it becomes necessary to again call your attention to the unique situation with regard to utilization of Colorado River water by the State of New Mexico.

The Secretary of the Interior in his recommendations, in a supplemental report on this project, issued in November 1953, recommended authorization of the Shiprock unit of the Navaho project including the Navaho Dam and the joint works to serve the South San Juan unit of that project. I wholeheartedly support that recommendation.

Because the Navaho project is merely one element of the unified program of development for New Mexico, we have sought conditional authorization on the complete program because of the necessity for recognizing the interrelation of all the elements of our program. Any development at this time of one of the elements without full consideration of the others can be of serious jeopardy to the ultimate full utilization of Colorado River water to which New Mexico is entitled.

It must be fully realized that the New Mexico situation is unique and that our efforts to obtain conditional authorization cannot be considered as a precedent or a reason for any other conditional authorization. Your earnest consideration of our particular problem is respectfully requested.

New Mexico feels that the present legislation substantially as is contained in H. R. 4449 and S. 1555 adequately covers the State's situation and urges a favorable report by your subcommittee.

Very truly yours,

E. L. MECHEM, *Governor.*

SALT LAKE CITY, UTAH, *January 9, 1954.*

Senator HUGH BUTLER: It is a privilege to write to you as head man of the Senate group on interior and insular affairs.

As a citizen and taxpayer of the State of Utah I would like your support on the Echo Park Dam. We need this water very much.

Thank you for your splendid work.

Sincerely,

Mrs. WILLIAM J. VINCENT.

NORTHWEST PUBLIC POWER ASSOCIATION, INC..
Vancouver, Wash., December 31, 1953.

Re Echo Park Dam

Representative A. L. MILLER,

*Chairman, House Interior and Insular Affairs Committee,
House Office Building, Washington, D. C.*

DEAR CONGRESSMAN MILLER: The Northwest Public Power Association endorses and urges the authorization and construction of Echo Park Dam.

A resolution to this effect was adopted by the board of trustees of this association at its winter meeting November 20, 1953. The association has made an office study of the project and of the upper Colorado River report of the Bureau of Reclamation. The objections of so-called nature groups have been noted and found to be deficient.

This association advocates multiple purpose, comprehensive development of water resources on a river basin basis including maximum feasible hydroelectric power utilization. The association also advocates development of recreation and wildlife potentialities. On the other hand we are opposed to single purpose use or monopolization of water resources. In the Echo Park case we see a dog-in-the-manger attitude on the part of national park specialists who advocate disuse of the river.

The Northwest Public Power Association is a nonprofit, nonpartisan trade organization of 93 public and cooperative electric systems in Idaho, Montana, Alaska, Oregon, and Washington. The association is interested in this case be-

cause of its bearing on availability of power at low rates and because of its bearing on comprehensive development. Public and cooperative systems in the Northwest serve 2 million people or 39 percent of the population.

Please enter this letter in the hearing record as an endorsement of Echo Park Dam.

Sincerely,

NORTHWEST PUBLIC POWER ASSOCIATION, INC.,
G's NORWOOD, *Executive Secretary.*

UTAH STATE AGRICULTURAL COLLEGE,
SCHOOL OF ENGINEERING AND TECHNOLOGY,
Logan, Utah, March 16, 1954.

HON. HUGH BUTLER,
*Chairman, Senate Committee on Interior Affairs,
United States Senate, Washington, D. C.*

SIR: The radio and newspapers of our area have devoted considerable time and space to the upper Colorado storage project issue during the past few months, and from our analysis of the news we feel that the issue is being clouded somewhat by the arguments raised by some well-meaning conservation groups and others. These powerful and influential groups either are not advised or they have lost sight of the fact that when the Dinosaur National Monument was increased to its present size it was specifically understood that the reservoir and power potential of the area would not be jeopardized. Rather than jeopardize the development of these natural resources, we would urge that the boundaries of the monument again be changed to exclude the Echo Park Dam site and area covered by the reservoir.

Engineers of our group have made careful studies of the various features of the project for a number of years, and we feel confident that the Bureau of Reclamation has made a thorough and complete investigation of all alternates, and that the plan being proposed by them is one which will provide the greatest possible returns from the Colorado River.

In considering this project, we urge that you carefully consider the following advantages derived from this project:

1. In order that the United States may build her national defense and become less vulnerable in case of attack, the inland resources of our country should receive major consideration for development in the next few years. It cannot be too greatly emphasized that developments of this kind will be of great value in our present-day economy, and will be of immeasurable greater value in the event of a national emergency.

2. The development of the inland resources of the Western United States (including agricultural, mineral, and power) is completely dependent upon the development of the surface-water resources.

3. The upper Colorado Basin storage project, and in particular the Echo Park development, is the key to the development of the thousands of acres of rich agricultural land in Utah and vast mineral resources within the State of Utah. The geography of Utah is such that the water taken from the Colorado River must be developed in the vicinity of Echo Park or it cannot be economically used within the State. The rainfall in Utah is such that further development of her rich agricultural and mineral resources is impossible without the development of the Colorado River. United States Bureau of Reclamation engineers have looked thoroughly into the possibility of alternative designs which would permit utilization of the river and development of the proposed areas. There are alternates to this proposal which do not include Echo Park Dam, but the best of these will inundate greater areas and increase evaporation and other losses estimated to be as much as 300,000 acre-feet annually. This is a sufficient water supply for a great industrial development, for 100,000 acres of agricultural land, or for a municipal supply for a city of over 500,000 population. This water is not available from any other source and it controls the development of land and mineral resources which cannot be realized in any other way.

4. The proposed project is such that it will not serve its purpose if only approved in part. The regulation of flow on the Colorado River which the project would provide is absolutely essential if the upper basin States are going to be able to develop and utilize their portion of the Colorado River.

5. The development of the upper Colorado River basin storage project would make available large blocks of hydroelectric energy now being wasted. The construction of the Echo Park Dam will make possible maximum power development.

6. The recreational facilities of this now primitive area would be greatly increased by creating a large body of fresh water accessible by first-class highways. This area, now inaccessible except to a very few daring and adventurous people, has potential recreational possibilities as great as Lake Mead and Hoover Dam. It should be pointed out that very few people ever saw Boulder Canyon prior to the construction of Hoover Dam, but millions have enjoyed this area because the dam was built. A similar vacation land can be created at Echo Park by the construction of a dam as proposed.

7. Water conditions conducive to game-fish development would be greatly increased at the site of the Echo Park Dam, in the lake above, and in the stream below the dam, thus increasing the recreational value.

8. The archeological value of the Echo Park site would not be decreased by the building of the Echo Park Dam, for the dinosaur quarry is many miles from the reservoir and would not be inundated. Furthermore, when the Dinosaur National Monument was expanded to its present size it was done with the understanding that it would not bar the development of the waters and resources in this area.

These and many other reasons lead us to believe that the upper Colorado Basin storage project, including the Echo Park Reservoir, should be immediately approved and we urge that you give earnest and careful consideration to the proposal as submitted by the Bureau of Reclamation. We solicit your personal support and that of your high office to insure the approval of this worthy project.

Very truly yours,

A. A. Bishop, Associate Professor, Irrigation and Drainage Engineering; J. E. Christiansen, Dean, School of Engineering and Technology and Professor of Civil Engineering; Clayton Clark, Associate Professor, Electrical Engineering; Larry S. Cole, Professor and Head Electrical Engineering; Spencer H. Daines, Head, Agricultural Engineering Department, and Associate Professor Agricultural Engineering; D. K. Fuhrman, Associate Professor, Irrigation and Drainage Engineering; Melvin J. Greaves, Associate Professor Civil Engineering; O. W. Israelsen, Professor, Irrigation and Drainage Engineering; William L. Jones, Assistant Professor Electrical Engineering; Harold R. Kepner, Professor Civil Engineering; C. H. Milligan, Head, Irrigation and Drainage Engineering and Professor of Irrigation and Drainage Engineering; Eldon M. Stock, Professor Civil Engineering; Willis A. Tingey, Assistant Professor Civil Engineering; R. K. Watkins, Assistant Professor Civil Engineering.

VERNAL CHAMBER OF COMMERCE,
Vernal, Utah, December 23, 1953.

Hon. HUGH BUTLER,
Chairman, Interior and Insular Affairs Committee,
United States Senate, Washington, D. C.

DEAR SIR: Enclosed is a copy of the resolutions from the board of county commissioners of Salt Lake County, State of Utah, endorsing the Colorado River project and participating projects.

Very truly yours,

L. Y. SIDDOWNAY,
Secretary, Colorado River Development Association.

RESOLUTION

At a regular meeting of the board of county commissioners of Salt Lake County, State of Utah, held on the 11th day of December 1953, at the hour of 10 a. m. in the commission chambers, city and county building, Salt Lake City, Utah, there being present the following commissioners: Adiel F. Stewart, Ray P. Greenwood, and Lamont B. Gunderson; and

Whereas the board of county commissioners of Salt Lake County has been informed that there will be considered at the forthcoming 83d session of the

Congress of the United States House bill 4463 authorizing the construction of the Colorado River storage project and participating projects, and

Whereas the board of county commissioners of Salt Lake County is of the opinion that this proposed legislation is of vital interest and importance to the development and prosperity of the State of Utah and that its passage will have an ultimate salutary effect upon the economy of Salt Lake County.

Now, therefore, in consideration of the premises, be it resolved by the board of county commissioners of Salt Lake County that the said board does hereby endorse House bill 4463 and recommends that early and favorable action thereon by the Congress of the United States at the forthcoming 83d session be taken. Be it further resolved that a copy of this resolution be sent to the various committees of the House of Representatives and the Senate of the Congress of the United States which will give consideration to said proposed legislation.

Dated this 11th day of December 1953.

BOARD OF COUNTY COMMISSIONERS OF
SALT LAKE COUNTY,

By ADIEL F. STEWART, *Chairman.*
By RAY P. GREENWOOD, *Member.*
By LAMONT B. GUNDERSON, *Member.*

Attest :

ALVIN KEDDINGTON, *County Clerk.*
By ALVIN KEDDINGTON.

RAWLINS, WYO., July 2 1954.

Senator FRANK A. BARRETT,
Senate Office Building, Washington, D. C.:

Support amendment offered by Senator Ed Johnson of Colorado to include the pothook and savery project in the Colorado Basin development plan. Echo Park now pending before the Senate.

SAVERY AND POTHOOK COMMITTEE,
LEELAND GRIEVE, *Savery, Wyo.,*
GEORGE SALISBURY, *Slater, Colo.,*
JOHN COBB, *Savery, Wyo.*
C. F. JEBENS, *Baggs, Wyo.*

RESOLUTION No. 8

Whereas the development of the Colorado River in the upper basin States, consisting of Arizona, Colorado, New Mexico, Utah, and Wyoming, is of foremost importance to the future development and general welfare of said States and of the Western United States; and

Whereas development in the Green River Basin of Wyoming will be an important part of the upper Colorado River program; and

Whereas regulation and storage of waters of the Green River and its tributaries are vital to the further development of irrigation, agriculture, and industrial expansion in western Wyoming; and

Whereas irrigation of the large areas of irrigible land in the upper Green River Basin will provide needed food and fiber to meet the requirements of a rapidly expanding population in the United States, and will further stabilize the existing agricultural development of Wyoming; and

Whereas regulation and storage of waters of the Green River will, in addition to providing water supplies for further irrigation, furnish a dependable water supply for use in expanding industry and development of the abundant local mineral resources; and

Whereas regulation and storage of waters of the upper Colorado River and tributaries will provide as a byproduct, large blocks of low-cost electric power vital to agricultural and industrial progress of Wyoming: Now, therefore, be it

Resolved, That the Wyoming Lions clubs favor and urge the enactment by Congress of legislation authorizing construction of the Colorado River storage project and participating projects as approved by the Committee on Interior and Insular Affairs of the House of Representatives; and be it further

Resolved, That certified copies of this resolution be promptly submitted to the Honorable Lester C. Hunt and the Honorable Frank A. Barrett, United States

Senators from the State of Wyoming; the Honorable William Henry Harrison, Representative at Large from the State of Wyoming; and all members of the Interior and Insular Affairs Committee of the House of Representatives; and also the chairman of the resolutions committee of Lions International.

Attest: The above resolution was officially presented to the convention of the Multiple District 15 of Lions International, consisting of the Lions clubs of Wyoming, and was on Tuesday, June 15, 1954, unanimously adopted by this said Wyoming State Convention of Lions.

C. C. Cox,

Wyoming State Council Secretary-Treasurer and also Convention Secretary for the Convention.

JUNE 30, 1954.

Re S. 1555.

Hon. HUGH BUTLER,

*Chairman, Committee on Interior and Insular Affairs,
Senate Office Building, Washington, D. C.*

MY DEAR SENATOR: I am sure you will not only remember being in our mines in New Mexico but will recall interviews I have had the good fortune to have with you from time to time in recent years.

Before going into the mining business 21 years ago I was in the Department of the Interior where I was concerned with the administration of national parks for 20 years. I was Director of the National Park Service during the latter part of the Coolidge administration and throughout the Hoover administration, running well into the new administration which began March 4, 1933, before retiring to private life.

I am very much concerned about the danger to the national parks and national monuments inherent in the proposal to build a dam at Echo Park in the Dinosaur National Monument, as provided for in a bill or bills now before your committee (S. 1555) to provide for the development of the upper Colorado River Basin.

I can make my point clear I think by quoting a memorandum I submitted to the House Committee on Interior and Insular Affairs which I submit to you at this point:

"A press release from the Department of the Interior states that departmental approval has been given by the Secretary to a program for the development of the upper Colorado River.

"This program contemplates the erection of several dams for the impoundment of water for the irrigation of arid land and the production of hydroelectric power. One of the dams specifically mentioned as being a part of the program is the Echo Park Dam, which, if authorized by Congress, would be built in the Dinosaur National Monument in Utah.

"The undersigned wishes to enter a strong protest against the erection of any reclamation or power structure in the Dinosaur National Monument. Should this Echo Park project be authorized, not only will the scenic and recreational features of the national monument be destroyed, but an extremely dangerous precedent will have been created, through the employment of which, projects in other national monuments and even in the great national parks themselves, might be and probably would be authorized in time.

"The national park and monument system began with the establishment of Yellowstone National Park in the administration of President Grant, through his approval on March 1, 1872, of the act creating Yellowstone National Park in the Rocky Mountains, in territory now lying within the States of Montana, Wyoming, and Idaho.

"The fundamental feature of the organic laws creating the national parks, beginning with Yellowstone, was the mandate that the territory reserved within the park boundaries should be retained in its natural condition. There was to be no exploitation of any of the resources of these parks, and there was to be no structure built within them except those that might be needed for the enjoyment of the areas by the public.

"By the act of August 25, 1916, the National Park Service was created as a bureau of the Department of the Interior, to administer and protect the national parks, national monuments, and other reservations assigned to its jurisdiction.

"This law contains the following provisions:

"The Service thus established, shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures, as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the

scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations' (U. S. C., title 16, sec. 1).

"Since the enactment of this law, there have been no dams, reservoirs, or other structures authorized to be built in territory under the protection of the National Park Service. In fact, the only infringement of the basic policy covering national park administration and protection was the act of Congress passed in December 1913 permitting the city of San Francisco to develop the Hetch-Hetchy Valley in Yosemite National Park for a municipal water supply. That law was enacted 3 years before the passage of the National Park Service Act of August 25, 1916, from which the above protective provision was quoted.

"All conservationists are undoubtedly in sympathy with further development of the upper Colorado River. However, there are a number of dam sites that can be utilized without invading the Dinosaur National Monument. While some might be more expensive and others might not be quite as effective from other standpoints as the proposed Echo Park project, this is the price that America can pay for the maintenance of its national park and monument system in its natural condition.

"It is respectfully submitted that the Echo Park Dam project should not be recommended to Congress by the administration, that it should not be included in messages to Congress regarding the budget or public works or the state of the Union, and that the upper Colorado River plan be reconsidered with a view to adopting one or more other sites in lieu of Echo Park in the Dinosaur National Monument."

I would prefer to ask for an opportunity to appear personally before the committee and state my views on this pending legislation, and give the committee in turn the opportunity to question me, but unfortunately I am confined to my room with an injury to a leg, and I am not able to travel.

I would appreciate very much your having this letter read to the committee, and carried into the hearings when they are printed for the use of the Senate.

With sentiments of high esteem, I am

Sincerely yours,

HORACE M. ALBRIGHT,
President, United States Potash Co.

HOUSE OF REPRESENTATIVES,
STATE OF ARIZONA,
June 30, 1954.

HON. EUGENE MILLIKIN,
*Chairman, Senate Interior Affairs Subcommittee,
Senate Office Building, Washington, D. C.*

DEAR SENATOR MILLIKIN: I am submitting herewith a protest against the upper Colorado River storage project bill on which hearings are being held before your subcommittee this week and request that this protest be inserted in the hearing record and made a part thereof.

Upper basin Senators are quoted in the press as stating at the hearing that they are grieved to note the strong opposition of California to this project, and that California wants 100 percent of the Colorado River waters without herself producing one drop.

We cannot refrain from asking why the upper basin States found it no occasion for grief some 25 years ago, but joined hands with California then to make possible what California has already taken from the river at the expense of Arizona.

Like Arizona, the upper basin States contribute water to the Colorado River while California contributes none. But this produces in the upper States no legal or moral right to export millions of acre-feet of water out of the river system and to take vast quantities of Arizona's power under the bill now being considered before your committee. This is no different than what California has already done, and would be as much or more at the expense of Arizona.

We are not among those who hail this proposal as equitable or an act of friendship by the upper basin States for Arizona, and we are not alone. The people of the upper basin States themselves who live within the basin are just as strongly opposed as we are to these transmountain diversions. Such is shown by their testimony in the record of the hearings before the House committee on this bill.

Attached hereto is copy of a protest against this bill to the House committee on January 14, 1954, by 34 members of the Arizona State Legislature, including myself as a member of the lower house. That protest was against the transmountain diversion units of the project, and against the use of power from Glen Canyon Dam or any other Arizona site to finance such diversions.

Also attached hereto is copy of my protest of January 16 to the same committee, in my capacity as trustee for the Colter filings in the Colorado River system made beginning in 1923 for the people of Arizona, which protest I hereby make applicable to the bill before your subcommittee. These prior and superior filings appropriated the storage waters and power of the river to develop 6 million acres and 5 million electrical horsepower in Arizona. These rights have been kept up with due diligence. They are now vested in Arizona landholders and water users, and cannot be transgressed by such transmountain diversions, solely power dams, or otherwise, and are ahead of California and Mexico. The Colter filings conform with maximum beneficial development of Arizona and the entire river system.

The upper basin States can use whatever water they want within the basin since such waters will return to the stream as reflow for reuse by Arizona and lower points.

But the transmountain diversion units are detrimental to Arizona, which has no water except the Colorado, and to all parts of the river system. The Colorado River Basin is one of the most water deficient in the United States. It is far too short of water to export it out of the basin.

We desire friendship among the basin States, and an early settlement of this matter on the basis of the equitable rights of each basin State under the law. The inequitable Santa Fe compact, to which this project bill is subject, should be rescinded by all basin States at the earliest moment. This would restore harmony and promote speedy and best development of the Colorado River for all concerned.

Sincerely yours,

SIDNEY KARTUS.

JANUARY 14, 1954.

HON. WILLIAM H. HARRISON,

Chairman, Irrigation and Reclamation Subcommittee of the Interior and Insular Affairs Committee, House Office Building, Washington, D. C.:

The undersigned members of the Arizona legislature protest against anything adverse to Arizona in the upper Colorado River storage project. We oppose the transmountain diversion units to export Colorado River water out of the river basin, and use of power from Glen Canyon Dam or other Arizona sites to finance such exportations. We consider it our duty to notify your committee of the opposition within the Arizona legislature to such proposals and of our intention to protect the interests of Arizona in this matter to the fullest extent possible. We ask that this protest be made part of record of hearings on this project which will be conducted by your subcommittee beginning January 18.

Robert Brewer; Robert E. Wilson; Carl Sims, Sr.; H. J. Lewis; Fred Dove; Mary Dwyer; A. H. Bisjak; Harold Burton; J. Ney Miles; Enos P. Schaffer; E. C. Johnson; Mabel S. Ellis; Jim Smith; David S. Wine; Owen A. Kane; Lewis B. Ellsworth; Laura McRae; L. S. Adams; W. H. Ridgeway; D. F. Benson; Sidney Kartus; David L. "Lucky" Lindsay; Harold W. Tshudy; Lorin M. Farr; Douglas Holsclaw; E. L. Tidwell; Sherman R. Dent; Etta Mae Hutcheson; Norman Lee; Frank G. Robles; John McInnes; W. W. Franklin; William S. Porter; J. P. Stump.

JANUARY 16, 1954.

HON. WILLIAM H. HARRISON,

Chairman, Irrigation and Reclamation Subcommittee of the Interior and Insular Affairs Committee, House Office Building, Washington, D. C.

DEAR SIR: Hearings being scheduled to begin January 18, 1954, before your subcommittee on the upper Colorado storage project, I hereby enter protest against said project, in my capacity as a State legislator and as trustee of the Colter water filings in the Colorado River system made beginning September 20, 1923, before the Arizona State land and water commissioner for and on behalf of the State of Arizona and water users under these filings.

In such capacities, I protest against any units of this project that would export water out of the basin of the Colorado River. I further protest against inclusion of Glen Canyon Dam in Arizona as a unit of such project, and against proposed use of power produced at Glen Canyon Dam to finance a number of participating projects to divert 5 million acre-feet of Colorado River water out of the basin in the upper basin States.

There can be no justification for taking the natural resources of one State—Arizona—for the benefit of other basin States which would be done under this project and the power policy of the upper basin States. I have in mind not only Glen Canyon Dam, but any other dam site or facility located within Arizona.

The water proposed to be transported out of the river system under this project, and the power to be produced at Glen Canyon Dam, are included among the waters and power appropriated since 1923 under the prior and superior Colter flings to irrigate 6 million acres and develop 5 million acres electrical horsepower in Arizona, all entirely within the basin of the Colorado River. Such waters, power, sites, and development in Arizona cannot lawfully be taken or impaired by said project or otherwise in violation of these Arizona water rights and flings which have been kept up with due diligence, and are now vested in Arizona landholders and water users.

We have no objection to the reasonable use of water by the upper basin States on lands within the Colorado River system in accordance with equitable rights, since reflow therefrom will return to the river for use in Arizona and at lower elevations.

We ask an end to the equitable division of Arizona resources among other basin States, and that Arizona receive its commensurate division of Colorado River water in accordance with its inherent natural rights and prior water flings under law.

Yours very truly,

SIDNEY KAETUS.

LOVELOCK, NEV., *June 29, 1954.*

CHAIRMAN OF SENATE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS:

Have just returned from boat trip down Yampa River in Dinasauro National Monument and can testify to its high scenic, inspirational, and recreational values. Save this irreplaceable heritage. Prevent exploitation of national parks. Prevent building of Echo Park and Split Mountain Dam. Remember errors in reclamation figures. Consider alternate sight.

EDWIN L. BRAUN.

SALT LAKE CITY, UTAH, *June 30, 1954.*

CHAIRMAN, IRRIGATION SUBCOMMITTEE,
United States Senate:

Please include in record of S. 1555 hearings the following vote of Salt Lake Grotto of National Speleological Society. Against Echo Park Dam majority vote. Against Glen Canyon Dam unanimous vote. We believe Utah groups officially favoring dams neither represent nor attempted poll membership or furnished them pertinent information.

EXECUTIVES COMMITTEE SALT LAKE GROTTO NATIONAL SPELEOLOGICAL SOCIETY.

ROOSEVELT, UTAH, *July 8, 1954.*

Senator MILLIKIN,
Chairman of Echo Park Dam Hearing,
Washington, D. C.:

Myton City Lions Club wholeheartedly advise your committee that we endorse the construction of the Echo Park Dam and central Utah project.

MYTON CITY COUNCIL,
W. H. LINK.

AMERICAN SOCIETY OF CIVIL ENGINEERS,
New York, N. Y., June 29, 1954.

HON. EUGENE D. MILLIKIN,
*Chairman, Subcommittee on Irrigation and Reclamation,
Senate Office Building, Washington, D. C.*

DEAR SENATOR MILLIKIN: Legislation authorizing the currently proposed billion-dollar upper Colorado project was considered by the board of direction of the American Society of Civil Engineers at its meeting on June 14-15.

Orderly and economical development of the water resources of the country is one of the most important factors in its future development. For a long time we have been deeply concerned about establishment of a sound national policy in that respect. As you know, the Hoover Commission has created a task force on water resources and power which at this time is studying the entire situation. Its report is to be expected in the not-distant future.

It is our belief that authorization for development of the upper Colorado project now would be inimical to the principles of a sound overall national policy. We are convinced that authorization should be postponed, at least until the findings and recommendations of the Hoover Commission are known.

The ASCE board of direction urges that your committee hold in abeyance for the present any final recommendation for or against authorization of the upper Colorado project.

Respectfully yours,

D. V. TERRELL, *President.*

PENNSYLVANIA FEDERATION OF SPORTSMEN'S CLUBS,
Allentown, Pa., June 28, 1954.

HON. EUGENE D. MILLIKIN,
*Chairman, Senate Subcommittee on Irrigation and Reclamation,
Senate Office Building, Washington, D. C.*

DEAR SENATOR MILLIKIN: On behalf of our over 200,000 members, vitally interested in conservation, we would like to implore you and your committee in the consideration of Senate bill 1555 to exclude the construction of Echo Park Dam in Dinosaur National Monument from the upper Colorado storage project.

We in Pennsylvania are interested in the preservation and expansion of all our national recreational facilities and natural resources. It is our sincere belief that it would be a gross injustice to destroy this national shrine and feel that this project could be accomplished with equal success by retaining this monument.

We realize you are very interested in this work, being one of the sponsors of the bill, but sincerely request that Echo Park Dam be withdrawn from the bill and if this cannot be done we trust that you and your committee will stand forthright in opposition to the measure to the end that the bill is not favorably reported from committee.

The writer, due to previous commitments, finds it impossible to attend your open hearing to present testimony in this respect but shall be very grateful if you will file our statement of opposition in the record of the proceedings.

Very respectfully,

EVERETT G. HENDERSON,
Legislative Representative.

UTAH COMMITTEE FOR A GLEN CANYON NATIONAL PARK,
June 24, 1954.

Senator EUGENE D. MILLIKIN,
*Chairman, Subcommittee on Irrigation,
Senate Office Building, Washington, D. C.*

DEAR SENATOR MILLIKIN: Since the Utah Committee for a Glen Canyon National Park was not given sufficient official notice of the time of the hearings on S. 1555 to physically have a representative present to present our statement in opposition to the proposed Glen Canyon Dam, it is our request that the enclosed official statement be made part of the record of the hearings, and, if possible, be orally presented to the subcommittee.

As the statement explains, this material was not presented to the hearings of the House Subcommittee on Irrigation. As a result of its action in pointing out the previously unchallenged discrepancies and falsities of the so-called fact

sheet of January 1954, of the Department of the Interior, several important groups have altered their earlier stand on this proposed dam.

We furthermore believe that your action in relying on the hearings of the House subcommittee is likely to disregard any of the known falsities of those hearings. As a single example of this, unrelated to the enclosed statement, we wish to point out the statements on pages 853 to 855 of the record of the hearings. These were stated to be the statements of "professional boatmen." John Hacking was at that time a high-school student and is now a farmer. The trip in question was the first time he had ever been on the river. He did pull a lady ashore, but it was some time after the trip was completed.

Dale J. Merrill is a farmer and truckdriver. It is possible that he has swam in the Green River, but he is not known to have piloted a boat on it.

Lynn Pope is a mechanic who was hired to help on two trips through Echo Park. William Slauch is his employer. He has been on the river 2 or 3 times. Grant Merrill is believed to have participated in 1 to 3 trips. He is a general handyman.

Merrill brought out a total of two persons, not "dissatisfied persons * * * at every point." Both had spent an earlier week on the river. Slauch's near-disaster is generally conceded to be the result of his own poor management. S. J. Hatch's trip was not under the direction of Buz Hatch. Harry Ratcliffe was in charge, and Mr. Hatch paid his share of the expenses.

The source of this information is Mr. Don Hatch, of Vernal and Salt Lake City, son of Buz Hatch. If you wish authentic information on such matters, it would seem best to make a fresh start with new witnesses.

It is our sincere regret that we have been excluded from these hearings, and request that the enclosed statement and this letter be made part of the record of these hearings.

Sincerely yours,

WILLIAM R. HALLIDAY,
Secretary.

LOVELOCK, NEV., *June 29, 1954.*

CHAIRMAN OF SENATE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS:

Some of us have just returned from trip to Yampa and Green Rivers in Dinosaur National Monument and believe this outstanding scenic wilderness should be preserved for future generations. There are too many inaccuracies to justify this huge expenditure for dams at this time. Urge further study alternate sites.

PHYLLIS HAY.
TOM AND VIRGINIA HAY.
MAX BATTCHEE.
Mr. and Mrs. RESIS SCHNEIDER.

WASHINGTON, D. C., *June 28, 1954.*

HON. HUGH BUTLER,
*Chairman, Committee on Interior and Insular Affairs,
United States Senate, Washington, D. C.*

MY DEAR SENATOR BUTLER: We have enclosed for the consideration of your committee a resolution of the San Diego County Water Authority, dated June 9, opposing the Colorado River storage project, as well as the Fryingpan-Arkansas project.

We would appreciate it, if possible, if this material could be included in the printed record on these projects.

Respectfully,

NORTHCUTT ELY.

A RESOLUTION OF MEMBERS OF THE BOARD OF DIRECTORS OF THE SAN DIEGO COUNTY WATER AUTHORITY OPPOSING COLORADO RIVER STORAGE PROJECT AND FRYINGPAN-ARKANSAS PROJECT, AND ENDORSING ACTION OF COLORADO RIVER BOARD OF CALIFORNIA IN RESPECT THERETO

RESOLUTION NO. 318

The San Diego County Water Authority is the distributor of Colorado River water to the city and county of San Diego, Calif. It's citizens and taxpayers have obligated themselves for the payment of many millions of dollars as the full

cost of the works constructed for that purpose. The economy of the area and the water supply of its inhabitants depend upon the continued availability of water from the Colorado River in the quantity and of the quality to which California is entitled under the Colorado River compact and the Boulder Canyon Project Act.

The citizens of San Diego County, and, in fact, all of California, pay a very large proportion of taxes collected by the Federal Government, and consequently have a serious concern that Federal funds be not expended on projects of questionable economic feasibility or which must be financed by heavily subsidized formulas—with the result that California taxpayers are financing both their own projects and those for other areas that may result in diminishing the quantity and quality of the water upon which large sections of the State must depend.

The Colorado River Board of California opposes the enactment of the acts authorizing the Colorado River storage project (S. 1555 and H. R. 4449, 83d Cong.), and the Fryingpan-Arkansas project (S. 964 and H. R. 236, 83d Cong.), for the reasons that the projects would adversely affect the quantity and quality of the water to which this State is entitled, and could not be constructed without unwarranted Federal subsidies and financed upon a formula lacking economic feasibility.

The San Diego County Water Authority endorses and approves the position taken by the Colorado River board, and joins in respectfully urging the representatives of this State in the Senate and House of Representatives to stand united in opposition to the enactment of legislation authorizing these projects—and to exert every effort to protect the people of this State from improper invasion of their water rights and unfair tax burdens to finance unsound projects.

STATE OF CALIFORNIA,

County of San Diego, ss:

I, Dorothy D. Miller, executive secretary of the San Diego County Water Authority, hereby certify that the foregoing is a true copy of a resolution approved by a majority of the members of the board of directors of said San Diego County Water Authority this 9th day of June, 1954.

DOROTHY D. MILLER,
*Executive Secretary of the Board of Directors,
San Diego County Water Authority.*

SALT LAKE CITY, UTAH, March 25, 1954.

President DWIGHT EISENHOWER,
The White House, Washington, D. C.

DEAR MR. EISENHOWER: In regard your announcement of last Saturday, I wish to call to your attention a recent vote of the Salt Lake unit of the National Speleological Society at its regular monthly meeting:

Against Echo Park Dam: a majority vote.

For a Glen Canyon National Park and against Glen Canyon Dam: unanimous vote.

Respectfully yours,

J. ROBERT KELLER,
Secretary, Salt Lake Group, National Speleological Society.

STEAMBOAT ROCK DISAPPEARS

What are the nature lovers doing to our Steamboat Rock in Dinosaur National Monument?

In 1941 the Geological Survey in cooperation with the National Park Service surveyed and mapped the Dinosaur area, map release as of 1945, showing the top of Steamboat Rock at 6,066 feet above sea level, stream bed elevation at bottom of Steamboat Rock at 5,060, or at that time this massive rock was 1,006 feet high.

Devereux Butcher, field representative of the National Parks Association, in the National Parks magazine of December 1950 somehow disposed of 206 feet of this giant and moved it to only 800 feet high—that made the 500-foot dam more impressive.

Then somehow Martin Litton, an official of the Sierra Club, got into Pat's Hole and he photographed the great rock down to 700 feet, see page 378 of the

March 1954, National Geographic. No one saw him carry off the top 100 feet which Mr. Butcher left there.

Now comes Philip Hyde in cooperation with the Sierra Club and he takes off another 50 feet by his photograph in the Sunset magazine, March 1954. He is very kind. He did not take such a big chunk, and he still left us 650 feet of rock and it still looks the same.

Now, I don't know exactly what they did with this billion tons of sandstone, but I think they have been feeding it to some of their associates all over the good United States and calling it—Save Our Scenery.

Now, gentlemen, or nature lovers, will you please bring back that 356 feet of our rock for we have plans to keep 500 feet of our magnificent Steamboat Rock out of water when the Echo Park Dam is built.

C. R. HENDERSON,
Vernal, Utah.

MOUNTAIN STATES ASSOCIATION

RESOLUTION ADOPTED BY THE MEMBERS AT THE ANNUAL CONVENTION HELD IN PUEBLO, COLO., APRIL 12, 13, 14, 1953

Whereas there is now before the Congress of the United States of America a bill which will cause the establishment of the Green River National Park; and

Whereas there is also before the Congress another bill which would prohibit the development of water resources within a national park or monument; and

Whereas the passage of the aforesaid bill would forever prohibit the development of the upper Colorado River, as well as other water-resource development in the arid West: Now, therefore, be it

Resolved, That the Mountain States Association in convention assembled this 14th day of April 1953 does hereby oppose the aforesaid bills; be it further

Resolved, That the Mountain States Association does hereby sincerely and earnestly urge the western congressional delegates to do all things necessary and possible to bring about the defeat of the two aforesaid bills; be it further

Resolved, That a copy of this resolution be sent to the President of the United States, Members of the House and Senate, Interior Affairs Committee, the Senators and Representatives of the Mountain States herein represented, and to the Governors of Arizona, Colorado, New Mexico, Idaho, Utah, Montana, Wyoming, and Nevada, the States comprising the membership of this association.

ROSEBURG, OREG., January 25, 1954.

Senator GUY CORDON.

Senate Office Building, Washington, D. C.

DEAR MR. SENATOR: This letter is to advise you of my feelings and those of many of my friends on the Dinosaur National Monument question.

If it is necessary to collect the water, it does not have to be done in Dinosaur National Monument. In fact, known alternate sites would collect more water, furnish more electric power, cost less to build, and are not in a national park. There are at least 10 alternate sites not in Dinosaur.

Only 1 percent of the land in the United States is in the national parks and only part of this is in the West. Why, then, does the water have to be stored in Dinosaur?

I have not yet seen Dinosaur, nor perhaps have you, but I feel that if it is at all as magnificent as the pictures of it, it is definitely worth saving. It will never even be the national park it should be unless these unnecessary dam sites are refused.

May I urge you to help keep Dinosaur National Monument as it is and protect the national park system.

Sincerely yours,

BEVERLY D. BROWN.

STATEMENT SUBMITTED BY ENGINEERS JOINT COUNCIL

This statement is presented by Engineers Joint Council, the offices of which are located in the Engineering Societies Building, 33 West 39th Street, New York 18, N. Y.

Engineers Joint Council is a federation of eight major engineering societies of the United States. One of its objectives is to provide a medium for a coordinated expression of the views of a majority of the engineering profession upon national problems invested with an engineering interest. At present EJC is comprised of representatives from the governing boards of the following societies, having a combined membership of about 170,000 engineers:

American Society of Civil Engineers
 American Institute of Mining and Metallurgical Engineers
 The American Society of Mechanical Engineers
 American Institute of Electrical Engineers
 American Institute of Chemical Engineers
 American Society for Engineering Education
 American Waterworks Association
 The Society of Naval Architects and Marine Engineers

In 1947, EJC established a national water policy panel. The panel was authorized to take such action as might be necessary to formulate and in due time to present to the Congress proposals aimed to result in the establishment of a sound national water policy.

After preliminary investigation and report upon the problem, the panel, at the further instruction of EJC, enlisted the services of 77 leading experts in the water-resources field. By far the greater number of the group were practicing engineers, largely in the consulting field. No member was a Federal employee but many in earlier years had been in Federal service and thus were familiar with the intragovernmental viewpoints. The group was adequately representative of the country geographically. The service so rendered was without compensation except that some of the traveling expenses was paid by EJC.

The objective as conceived and carried out, was to make a detailed study of the seven major functional fields of water-resources development and use, of policies of general applicability and of basic information concerning water resources, and then to make pertinent recommendations.

A preliminary report was made in June 1950 for the benefit of the President's temporary Water Resources Policy Commission. Then, in July 1951, the printed report was issued under the title of "Principles of a Sound National Water Policy." A copy of that report was sent to each Member of the Congress.

Recognizing the multitude of pressures on the time and thought of Members of the Congress, the attention of the members of this committee is again respectfully called to that report. Additional copies will gladly be furnished upon request.

In implementing the policies enunciated in its report on national water policy, EJC (operating through its national water policy panel) does not concern itself with the merits of any given water-resources project as such. In fact, even though EJC is composed of and represents engineers, it does not concern itself with the feasibility of specific projects from the engineering or physical standpoint. It is interested in the economic feasibility of specific projects, but only as regards principles and policies. Thus, in the case of the Colorado River storage project, it is primarily concerned because of the broad principles and policies involved in the pending bill.

From the very beginning (in 1947) of pertinent discussions and planning, apropos the engineers' contribution toward a sound national water policy, it has been the view that the crying need for a uniform, as well as sound, policy in the field of Federal water-resources development can be met completely only by action of the Congress. The executive branch, being subject to statutory limitations, can do something, but not enough, fully to accomplish the objective.

It was concluded not to submit any draft of legislation aimed to implement the principles of a sound national water policy. Instead, it was hoped, though not to the point of formal recommendation, that the Congress might set up a commission or a joint committee for the specific purpose of studying the need for and possible content of a sound national water policy, uniformly applicable among the several executive agencies. Such study would presumably have resulted in specific legislative proposals.

However, in July 1953, by act of the Congress, approved by President Eisenhower, there was set up a bipartisan Commission on Organization of the Executive Branch of the Government, being headed, as was a previous Commission, by ex-President Hoover. That Commission is commonly referred to as the Hoover Commission. The enabling legislation is understood to intend that Commission to investigate this very matter of water-resources policy. Indeed, as is a matter

of common knowledge, that Commission has set up a task force on water resources and power under the chairmanship of Adm. Ben Moreell (retired). Thus the Hoover Commission, a creature of the Congress, but with one-third of its membership appointed by the President, appears to be admirably adapted for investigating the needs of, and making recommendations in regard to, a national water-resources policy.

From the viewpoint of Engineers Joint Council, the pending bill (S. 1555) which is intended to provide for the comprehensive development of the water resources of the upper Colorado River Basin, is exceedingly important because of the policies continued or newly enunciated in the bill. The same holds true as regards H. R. 4449 in the form reported June 9 by the House Committee on Interior and Insular Affairs. To be sure, the principles and policies stated in either of these forms of proposed legislation are not on the faces of the bills prescribed to be effective or controlling as to future projects. However, what is under consideration here is a project, or rather a group of projects, with initial authorization of about \$1 billion and ultimate cost of perhaps \$5 billion. Consequently, it would be absurd if one did not recognize that the policies initiated or kept effective in the enabling legislation for the Colorado River storage project would be tremendously influential, if not controlling, in their effect upon future projects.

Actually, the policies set forth in the pending bill represent in the main either such as have obtained over the past decade or two or such have been advocated with regard to, and in some cases embodied in, various of the more recent Federal resources projects. Such departures from past policies of tendencies as are embodied in S. 1555, appear to be limited in large part, if not entirely, to the power-marketing field.

The need for, or at least the development of large multipurpose projects appeared first in the case of Hoover Dam but since that time has been growing by leaps and bounds. The corresponding development of pertinent policies has proceeded apace but by no means in parallel, coordinated manner among the several Federal agencies such as, in the main, the Bureau of Reclamation, the civil functions of the Army engineers and the Tennessee Valley Authority. The tendencies toward lack of uniformity and the resultant inconsistencies were aggravated during the period of necessarily rapid formulation and construction of Federal water resources projects aimed to be helpful in alleviating the effects of the severe depression of the 1930's.

We submit that this matter of national water policy, like some other things, has long warranted the taking of a New Look. And the time for the New Look is now—not after this huge upper Colorado project and the pertinent policies have crystallized in the enabling legislation.

In view of the foregoing facts and considerations, Engineers Joint Council respectfully submits that it will be logical and for the best interests of the country if the Congress refrain from authorizing the Colorado River storage project and other large or costly water resources projects until after the Hoover Commission has had opportunity to complete its current studies and to submit its pertinent recommendations to the Congress. EJC urgently recommends that this be done.

We frankly concede that not every one of the EJC-recommended principles meets the approval of every one of the members of the constituent national societies, but we do submit that they represent the by-far-preponderant consensus of the opinion of the membership. We, therefore, submit further that the EJC principles at the very least are entitled to serious consideration. The mere fact that such principles have been so objectively drawn up by a group of qualified experts warrants the taking into account of them before the Congress somewhat hurriedly embarks upon a project fraught with serious questions of principle and policy.

Whether or not EJC is right in its proposals and recommendations, the time for the taking of the careful and long New Look is here and an appropriate instrumentality is the Hoover Commission.

By way of illustrating and emphasizing matters of principle and policy which warrant the taking of a careful, long New Look, we submit in the following some specific respects in which the policies or prescriptions, or lack of them in S. 1555 differ from the recommendations of the EJC national water policy panel, i. e., differ from the principles of a sound national water policy as published in July 1951:

1. Engineers Joint Council has taken a strong position against the authorizing of water resources projects except by acts of Congress and against the

authorizing, even by the Congress, of projects or programs on a "blanket" basis. The pending bill in essence provides just such undesirable blanket. To be sure, it specifies for authorization certain named units of the Colorado River storage project and more than a dozen so-called participating projects. But apparently it would leave it to the Secretary of the Interior, and repose in him authority, to make the blanket authorization effective as to specific projects, on the basis of his findings as to engineering feasibility and economic justification. In any event, the authorization of the individual projects is not tied to specified detailed demonstrations of engineering or economic justification. In short, in the EJC view the bill is undesirable in lumping together a relatively large number of projects instead of authorizing them project by project, each on the basis of a clearly identified agency report with clear-cut demonstration of the project's economic justification.

2. Moreover, EJC recommends that for each project there should be a specific monetary authorization of appropriations, such authorization to constitute a ceiling in dollars as to expenditures for the project, unless and until such ceiling is specifically raised by congressional authorization. S. 1555 does not even limit the total of appropriations authorized for the entire group of projects, let alone limitations upon authorized appropriations for the respective individual projects.

3. The EJC recommendations oppose the use of basin accounting, for obviously that form of accounting leaves room for the construction of projects which are not economically justifiable. Basin accounting does this by using the actual or presumed favorable margins of financial justification in the cases of better projects to make up for the deficiencies of inferior project—projects which could not stand the test of economic justifiability if subjected to that test each solely on its own merits. It is therefore regretted that the bill, although not using the term "basin accounting," provides for that very procedure. The EJC opposition to basin accounting is not to be construed as connoting opposition to the planning of water resources projects on a basinwide basis. The latter is strongly favored by EJC.

4. An EJC recommendation is that there should be created a board for the impartial analysis and appraisal of Federal water projects, and that review and report by the board upon such projects be made a prerequisite to the authorization or appropriation by Congress of or for projects of that kind. The aim would be to obtain independent and objective analyses and appraisals of projects submitted by the respective Federal agencies. EJC has taken no position upon the question as to whether such a board should be responsible to the Executive or to the Congress. In contrast, the pending bill provides for no check by the equivalent of any such board, whether as regards engineering feasibility or economic justification or allocations of cost. It is believed that the logic of and outright need for such a board are inescapable and patent. It is to be noted that, before sanctioning the construction of Hoover Dam, the Congress provided for the Colorado River Board a principal assignment to which was an independent review of agency recommendations.

5. In the EJC report, a position was taken in opposition to the then current practice of the Bureau of Reclamation of using certain proceeds from the sale of power (specifically, the interest figured upon the power development cost) to subsidize affiliated irrigation development. More specifically, this "interest component" of the proceeds from power was used to offset portions of irrigation project costs which were held to be beyond the ability of the irrigation farmers to pay. It is understood that such diversion of the interest component is being discontinued, at least as regards new projects. However, in lieu there has been developed a so-called Collbran formula which avoids the one evil but in turn embraces another (see act of July 3, 1952, 66 Stat. 325, authorizing Collbran reclamation project, Colorado).

In particular, this formula would result in payment, into the Federal Treasury, of interest on all unamortized cost allocated to power but, once amortization thereof has been completed, all further power earnings would be used to subsidize irrigation. In the meantime—practically from the very beginning—the construction and operation of the irrigation projects would be carried on, with the result that, except for the generally minor fraction of cost which the irrigation farmers can afford to pay, the irrigation cost would be outstanding unamortized and without any charge for interest. Such status would extend for a generation or two, i. e., until the cost of the power development had been completely amortized and proceeds from the power development had become available in turn for amortization of the irrigation cost.

In its several forms, the Collbran formula is contrary to the principles advocated in the 1951 EJC report. A form of that formula, though of course not bearing that name, is embodied in the pending bill as a key feature thereof.

6. For Federal water resources developments, EJC recommends that economic justifiability be measured by the ratio of tangible benefits to cost and that the annual benefits should exceed the annual costs by at least one-third of the latter. Nothing short of such a margin is deemed to be reasonable. On the other hand, according to the pending bill, a minute excess of benefits over costs would be acceptable. In practical effect, where benefits do not materially exceed costs, there is merely an exchange of dollars of benefit for dollars of cost; there is increase in the national debt (or alternatively in the tax burden) but no compensating increase in the national wealth.

It is to be noted that, because of the proposed basin accounting, an adequate overall ratio of benefits to cost for the group of projects would not safeguard against the inclusion of projects which would actually be in the red and would constitute a drain upon the national economy.

7. As to the allowable period of amortization of the investment in such water resources projects, EJC recommends that it be not more than 50 years. Until recent years, such has been the practice with regard to Federal projects and it remains the maximum period allowable under the Reclamation Project Act of 1939. The pending bill, on the other hand, would increase the pay-out period for irrigation projects from a maximum of 50 years to a maximum of 60 years, taking into account the 10-year nonpay period allowed for development per section 9 (d) of the Reclamation Project Act. Incidentally, the bill would confirm the previously and specially authorized pay-out period of 68 years for the participating Paonia irrigation project. And, as regards power developments, apparently having in mind the application of the equivalent of the Collbran formula, the pay-out period, from the date of completion of the power features, could be prolonged indefinitely beyond 50 years provided only such extension be justified in the judgment of the Secretary of the Interior and concurred in by the Federal Power Commission.

Such prolongations of the period for so-called self-liquidation are believed to be economically unsound and contrary to the interests of the Federal taxpayers.

8. Under the bill and contrary to EJC recommendations, the extent (in dollars) of subsidization of participating irrigation projects is not and would not be fully disclosed, whether for the entire group of projects, or for the individual projects. This is true whether the subsidy be in the form of waiver of interest on the portion of the investment allocated for repayment of the remainder of the irrigation costs, or in the form of extension of the period during which repayments from either source are prescribed to be completed. EJC recommends that all subsidies be not merely fully disclosed but also directly voted by the Congress for the individual projects. The only permissible exceptions would be in cases where two or more projects actually are physically interdependent.

The foregoing instances of divergence between the provisions of the bill and the recommendations of engineers joint council are illustrative but by no means exhaustive.

ALLISON, COLO.

The Mount Allison Grange No. 308, in regular session, endorsed the Echo Park Dam project.

As farmers and ranchers, we are intensely interested in water conservation. Feeling that the damage to the Dinosaur National Monument will not be great enough to compensate for the loss of water that could be stored in the dam, we want to go on record as heartily endorsing this project. Since only 140 people visited this monument in the entire year of 1953, it is obvious that its inaccessibility precludes the fact that it is not a drawing card as a tourist center.

We are also convinced that the earnings from power produced at Echo Park and other large reservoirs included in the Colorado River storage project will provide a subsidy for local projects such as Florida, Pine River project extension, and Hammond in New Mexico. It sounds like good business to let this project pay for future water conservation, rather than to ask the Government for aid.

It is further resolved that the construction of this dam is an absolute necessity as an integral part of the storage of water to meet Colorado's commitment to the upper Colorado River Basin compact.

ELMER BRIGGS, *Master*.
 ANTOINETTE ENGLER,
(Acting) Secretary.
 J. W. TUBBS,
Chairman, Agricultural Committee.
 RUDOLPH SWANEMYR,
Chairman, Executive Committee.
 PARIS G. ENGLER,
Chairman, Legislative Committee.
 HARRY ENGLER,
Chairman, Resolutions Committee.

SALT LAKE CITY, UTAH, *June 28, 1954.*

Senator EUGENE D. MILLIKIN,
United States Senate, Washington, D. C.:

DEAR SIR: Utah Planning Conference, consisting of all city and county planning representatives, many mayors, county commissioners, and other officials, in annual meeting passed following resolution:

Whereas many years of study reveal Bureau of Reclamation upper Colorado plans, including Echo Park Dam, best for people of the West; and

Whereas overall broad planning concepts call for this project in interest of entire Nation; and

Whereas project will be less sound if Echo Park deleted: Now, therefore, be it Resolved by Third Annual Utah Planning Conference, Full support given to upper Colorado Basin project, including Echo Park Dam, and request strongest possible support of project in Congress.

GEORGE H. SMEATH,
Chairman, Utah Planning Conference.

NATIONAL PARKS ASSOCIATION,
Ely, Minn., June 26, 1954.

Senator HUGH BUTLER,
Chairman, Committee on Interior and Insular Affairs,
United States Senate, Washington, D. C.

DEAR SENATOR BUTLER: Before the Senate adjourns, the upper Colorado project may be brought before your committee. The National Parks Association, with representation in every State in the Union, is opposed to the inclusion of Echo Park Dam in this project. We, as well as all the major conservation organizations, feel that if this dam is built in Dinosaur National Monument, that it will be a violation of the entire national park system and jeopardize the safety of every park and monument within it.

We are not opposed to the upper Colorado project as such, but we feel strongly that it would be a terrible mistake to build Echo Park Dam, in view of the fact that there are a number of excellent alternative sites available. If this dam is built, it will be the first direct violation of the national park system since the parks were first created in 1872. Future generations would then point to Echo Park as the beginning of the breakdown of the natural areas Congress is pledged to preserve.

Sincerely yours,

SIGURD F. OLSON, *President.*

CITY OF LOS ANGELES, CALIF., *June 23, 1954.*

The VICE PRESIDENT OF THE UNITED STATES,
Washington, D. C.

SIR: At the meeting of the council held June 23, 1954, a resolution was adopted that the Los Angeles City Council, acting for the welfare of the city and its residents, express its strong opposition to bills S. 1555 and H. R. 4449, now pending in Congress, which bills would authorize the initial units of the Colorado

River storage projects and participating projects, and urge the Senators and Representatives in Congress from the State of California to oppose the enactment of this legislation.

A certified copy of the resolution is enclosed for your information.

Yours very truly,

WALTER C. PETERSON,
City Clerk.
By J. F. SCHWARTZLOSE, *Deputy.*

CITY OF LOS ANGELES

RESOLUTION

Whereas the city of Los Angeles and the more than 2 million persons who now reside here are dependent upon the Colorado River for vitally important quantities of water and power for civic needs, as well as for residential and industrial uses; and

Whereas the share of Colorado River water and power for which this city has contracted and which it must continue to have to sustain its economy is threatened under the provisions of bills S. 1555 and H. R. 4449 now pending in Congress, which bills would authorize the initial units of the Colorado River storage project and participating projects: Now, therefore, be it

Resolved, That the Los Angeles City Council, acting for the welfare of the city and its residents, expresses its strong opposition to bills S. 1555 and H. R. 4449 and urges the Senators and Representatives in Congress from the State of California to oppose the enactment of that legislation; and be it further

Resolved, That a copy of this resolution be sent to Vice President Richard M. Nixon, Senators William F. Knowland and Thomas H. Kuchel, all Members of Congress from the State of California, and all members of the Rules Committee of the House of Representatives.

Presented by Councilman Harold A. Henry.

Seconded by Councilman Charles Navarro.

I hereby certify that the foregoing is a true and correct copy of the resolution adopted by the council of the city of Los Angeles at its meeting held June 23, 1954.

WALTER C. PETERSON,
City Clerk.
By J. F. SCHWARTZLOSE, *Deputy.*

STATEMENT OF CLYDE T. ELLIS, EXECUTIVE MANAGER, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

INTEREST OF RURAL ELECTRIC COOPERATIVES

My name is Clyde T. Ellis. I am executive manager of the National Rural Electric Cooperative Association, the national service organization of 935 rural electric cooperatives and power districts in the United States and Alaska.

From time to time, as the occasion arises, representatives of the rural electric systems throughout the country appear before various committees of the Congress for the purpose of supporting legislation authorizing the construction, and appropriations for the construction of multiple-purpose projects which produce electric energy. Our people do this not because of any inherent political or philosophical convictions concerned with the idealistic virtue or lack thereof of Federal power development. It is simply a business matter in that the rural electric systems, as preference customers under the law, receive direct and indirect benefits from such projects in localities where the Federal hydroelectric energy is available to them and where the influence of Federal hydroelectric projects has brought about an improvement of service and reduction of wholesale rates to the rural electric

systems from privately owned electric utility companies by its competitive influence.

On the average, the rural electric distribution systems of the United States pay out 32 percent of their total gross revenue for the purchase of power. From commercial power companies they purchase 50.4 percent of their total wholesale energy input; from Federal agencies they purchase 28 percent; and from REA borrowers, largely their own generation and transmission co-ops, they purchase only 13.6 percent of their total input.

During the fiscal year ending June 30, 1952 (the latest available figures), the rural electric systems of the United States paid an average of 7.9 mills per kilowatt-hour for their wholesale energy. In areas such as Washington, Oregon, Idaho, Montana, and Tennessee where there is an abundance of federally produced energy, our systems paid between 3.2 and 5.0 mills per kilowatt for their power. In such States as Oklahoma, Arkansas, Alabama, Georgia, Wyoming, and New Mexico, where the wholesale energy supply is a combination of federally produced power and privately purchased power, or where Federal power projects are close by, our systems paid between 5.6 and 7.9 mills per kilowatt-hour for their wholesale energy. By contrast, in States such as Utah, Colorado, North Dakota, South Dakota, Minnesota, Maine, and Vermont, where there was no Federal hydroelectric power available our people paid the commercial utility companies between 9.6 and 15 mills per kilowatt-hour for their wholesale energy. This is 1 of the 2 major reasons our people in the upper Colorado Basin have long looked forward to the development of the upper basin.

Our people in the Mountain States also anticipate that development of the upper basin will not only lower the cost of their wholesale energy, but that it will make electricity abundant in a section where it has heretofore been and is now relatively scarce. Even now several of the rural distribution cooperatives in the tristate Colorado-Nebbraska-Wyoming area have formed a generation and transmission group in order to supply their own energy needs from REA-financed G-T facilities. Our people in general turn to REA-financed generation only when alternative supplies of energy are nonexistent, inadequate, or unreasonably expensive. Power scarcity is our second reason for asking authorization of the Colorado River storage project.

The bill now under consideration by the subcommittee for the development of the upper Colorado River Basin would authorize the Secretary of the Interior to construct altogether some 1,318,000 kilowatts of hydroelectric generating capacity which, according to the Bureau of Reclamation figures, would produce 6,469 million kilowatt-hours of annual generation including the units of the Colorado River storage project itself, and the participating projects as outlined in the bill.

The Supplemental Report on the Colorado River Storage Project and Participating Projects, submitted to the Secretary of the Interior, November 13, 1953, recommends that the Echo Park unit, with an installed capacity of 800,000 kilowatts, be constructed first, to be followed by the other units and participating projects. These, of course, are the two largest power installations of the whole plan. The rural systems of Colorado are also anxious to see the 40,000-kilowatt Curecanti power unit constructed. For this reason, our people of

the several-State area in which the power from these projects would be marketed would like to see construction of them started as soon as possible. As we now understand it, from information contained in the Bureau of Reclamation regional director's 1950 report on these projects, and from supplementary information presented to this subcommittee by the Bureau of Reclamation's regional director, Mr. E. O. Larson, several days ago, power from these projects will be marketed in an area comprising portions of northwestern New Mexico, northeastern Arizona, western Colorado, eastern Utah, southwestern Wyoming, and southeastern Idaho, and we understand it is contemplated that power may be available from the upper Colorado project, and such other projects as are integrated with it in nearly all of the area encompassed by these States.

ENERGY COST SAVINGS

Mr. Larson, the Bureau of Reclamation's regional director, stated in his prepared testimony submitted to the subcommittee that—

Transmission costs and the estimated average rate of 6 mills per kilowatt-hour for the sale of system energy are based on a delivery of power to load centers by either Federal or other means of transmission.

For the purpose of obtaining at least an estimate of the benefit to the rural electric systems that would accrue from the construction of the Echo Park and Glen Canyon units, we have compiled table 1 attached. This table contains the names of the 18 rural electric systems which lie within or directly adjacent to the section of the country which has been designated by the Bureau of Reclamation maps and by the 1950 report as the "principal proportion" of the power marketing area for the Colorado River storage project. These 18 rural electric systems located in the States of Colorado, New Mexico, Idaho, Utah, and Wyoming generate or purchase an approximate total of 92.3 million kilowatt-hours of energy per year based on REA statistics. One of these cooperatives in Wyoming generates the majority of its power from its own hydroelectric facilities and already enjoys a very low rate. One other cooperative in Wyoming and one in Idaho already purchase low-cost power from the Bureau of Reclamation and presumably these three systems would not save any appreciable money by construction of the upper Colorado project. However, all of the remaining 15 systems, including those in western Colorado who are paying a premium wheeling fee for the delivery of Federal hydroelectric power at the present time, would enjoy appreciable saving if 6-mill power were available to them from the proposed upper Colorado project. These 15 systems now paying approximately \$802,248 per year for their wholesale energy, whereas were the same quantity available at the 6-mill rate, the total cost would be \$483,006 and there would be an estimated yearly saving of \$319,242. These systems now pay anywhere from 18.3 mills downward for their wholesale energy, as indicated in the table, compared to the estimated delivered price of 6 mills for the power from the Colorado River storage project.

In addition to the saving that would be afforded our systems in the "principal portion" of the marketing area proposed for the upper Colorado project, it would appear from the estimated ultimate in-

stalled capacity of all the units and participating units that there would be considerable annual energy above and beyond the needs of the preference customers in the "principal portion" of the marketing area. We think this is especially significant in that the Bureau of Reclamation has stated, in explaining its new Marketing Criteria for the Missouri River Basin, that there may not be any additional power available to preference customers in the Missouri River Basin beyond the year 1956. As it has been suggested, and if as is set forth in the bill, the hydroelectric power plants constructed in the upper Colorado River Basin are—

operated in conjunction with other Federal power plants, present and potential, so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates.

We feel that there well may be additional power available from the project for distribution to the rural electric systems in at least the western division of the Missouri River Basin. In general, the loads of the rural electric systems throughout the country are doubling every 4 years, and we feel that the authorization and construction of additional hydroelectric facilities is absolutely essential to the continued existence and development of a strong rural electrification program in the Missouri Basin States, as well as in the upper Colorado Basin area.

POWER MARKETING LANGUAGE

We are indeed happy to see that the proposed legislation provides that in the construction, operation, and maintenance of the proposed facilities, the Secretary of the Interior shall be governed by the Federal reclamation laws which we assume to mean that power will be marketed from these projects in full accord with the provisions of these laws granting preference in such sale to municipalities, rural electric cooperatives, and other nonprofit organizations. We are also glad to note that the legislation provides that it is proposed to operate the upper Colorado River Basin projects so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates. The rural electric systems require, for the most part, firm power and energy and except for those few systems that own their own generation facilities, they are unable to economically utilize peaking capacity and/or secondary and dump energy.

We are, however, seriously concerned by the language contained between lines 6 and 25 of page 7 of S. 1555. This language reads as follows:

Electric power generated at plants authorized by this Act and disposed for use outside the States of the upper Colorado River Basin shall be replaced from other sources, as determined by the Secretary, when required to satisfy needs in the States of the upper Colorado River Basin, at rates not to exceed those in effect for power generated at plants authorized by this Act. Contracts for the sale of power for use outside the States of the upper Colorado River Basin shall contain such provisions as the Secretary shall determine to be necessary to effectuate the purposes of this Act, including the provision that if and when the Secretary finds (a) that such power cannot practicably be replaced from other sources at rates not exceeding those in effect for power generated by plants authorized by this Act, and

(b) that such power is required to satisfy needs in the States of the upper Colorado River Basin, then such contracts shall be subject to termination or to modification to the extent deemed necessary by the Secretary to meet power requirements in the States of the upper Colorado River Basin.

We do not recall this type of language being used in preceding bills authorizing Federal power projects, and our initial interpretation of it would lead us to believe that it might lead to modification and perhaps abrogation of the preference provision of the reclamation laws. This language would seem to imply that nonpreference customers within the States defined as the upper Colorado River Basin, would be entitled to preference in procuring power from these projects over nonpreference customers whose service areas lay even slightly outside of the area defined as the upper Colorado River Basin. In other words, were the rural electric systems and other preference agencies in the upper Colorado River Basin States unable to initially or ultimately utilize all of the firm energy available from the projects, the remaining portion of the energy would be sold to nonpreference customers within these States, if they desired it, rather than to preference customers lying outside of the upper Colorado River Basin area, even though the power could be made available to the preference customers over the existing or proposed facilities of the Federal Government that were electrically integrated with the upper Colorado River Basin project. In general, neither State lines nor the peripheries of river basins bear any relation in distance from a project to economical transmission distances from a project.

We therefore would urge the subcommittee, in considering authorization of this project, to examine this portion of the bill closely, and to consider its effect on the preference provisions of the Federal power-marketing laws. The rural electric systems of the country, even with the advantage of the preference laws, as they have remained for many years, purchase only approximately 5.9 percent of all the energy from existing Federal power projects as compared to 21 percent that is purchased by the private utility companies. To now authorize the construction of a project as gigantic as the upper Colorado River Basin project without adequate provision being made for the sale of this power and energy in accordance with the full meaning of the existing and long-established preference legislation, could, we think, mean the beginning of the end of preference for our people, and, therefore, the end of their ability to purchase any power from Federal dams. We note that the bill reported by the House Interior and Insular Affairs Committee contains no such language even though the original bill before that committee did contain such language. We urge this committee to strike such language from S. 1555.

We note that the authorization bill for the upper Colorado River storage project includes authorization for the construction of "transmission facilities." We are glad to see this in the bill, and we hope that the Congress, if it authorizes the project, will have in mind that the existence of Federal transmission facilities is the only effective means for carrying out the preference provisions of Federal power-marketing legislation and the only means of passing the benefits of Federal hydroelectric development to the preference customers. The rural electric cooperatives, in general, are small and unable to build

the necessary high-voltage facilities required to take the power from the Federal bus bar. Therefore, except in rare cases, the commercial companies would, without the existence of federally constructed transmission facilities for the delivery of Federal power to the load centers of the cooperatives, be in a position to purchase all of the output of almost every Federal hydroelectric project.

POWER COMPANY PROPOSALS

We have read with considerable interest the statement presented to the House subcommittee during its hearings on H. R. 4449 on behalf of nine commercial utility companies serving the general area of the upper Colorado River Basin. We agree that the powerplants comprising the Colorado River Basin project should be built by the Federal Government. However, we do not agree that the general premise of any power-marketing arrangement should be incorporated in legislation authorizing this project, as has been suggested in the statement submitted to that subcommittee on behalf of the nine power companies. We did not authorize legislation which contained such provisions, and we feel that such provisions would restrict and hamper the Bureau of Reclamation in disposing of the power and energy of the projects, in accordance with the preference provisions of the law and in accordance with the best interests of the Government. We feel that the power should be marketed from these dams as has been done in the past—by negotiation with the preference agencies and the power companies involved. In our opinion, the authorization legislation is not the appropriate place to consider administrative details of power marketing, and inasmuch as the Bureau of Reclamation has recommended at this time only a partial development in terms both of storage and of water utilization, it would seem, at the very least, premature to include in the initial authorization, restrictive language which might tie the hands of officials attempting to market power from subsequently authorized projects in the best interests of the Government and the people.

To us, the meaning of the fourth principle submitted by the power companies in connection with their plan for disposing of the power from the proposed projects is confusing. We are not clear as to the meaning of—

deliver project power to preference customers, making such reasonable transmission charges therefor as may be approved by the local regulatory authorities; or, the private utilities are willing to contract directly with the preference customers to supply all their power requirements at rates which will pass on such savings as are obtained through the purchase of project power.

Our initial interpretation of this language leads us to believe that it is basically similar to a plan previously proposed by power companies in Colorado for disposal of power from the Fryingpan-Arkansas project. The language does not, I think, state or imply that the companies will “wheel” power to preference customers for the account of the Government. In many areas, the power companies are, at the present time, wheeling power from Federal projects to preference customers for the account of the Government, and, in our opinion, this arrangement is the only safe and practical alternative method of passing on to the preference agencies the benefits of Federal hydropower where Federal transmission facilities are not avail-

able. However, the proposal submitted to the subcommittee by these nine companies does not, according to our interpretation, propose actual "wheeling" but proposes a plan roughly similar to that now advocated by the Georgia Power Co. for the marketing of Clark Hill power.

In our opinion, both of the alternatives proposed by the power companies, in principle No. 4 of their prepared statement submitted to the House subcommittee, would involve the purchase of the entire output of all the dams by the companies which would then either resell to the preference customers such power as the companies themselves define as firm energy, limiting the preference customers to amounts of power so defined by the companies, or the companies would agree to sell the preference customers their entire requirements, passing on to the preference customers in the form of very slightly reduced rates, a small portion of the benefits of the projects. This is what the Georgia Power Co. is now demanding, even now enjoying. We do not accept either of these alternatives. In our opinion, the only way the preference customers can realize a just share in the benefits of the project is either for the Government to build transmission facilities adequate to deliver the project power to their load centers, or for the Government to exchange peaking capacity or other particular types of power or money in return for the companies' commitment to deliver firm power and energy to the preference customers for the account of the Government. We would prefer Federal transmission to our load centers. It provides us more security.

CONSERVATION ARGUMENTS AGAINST PROJECT

We realize that there has been considerable opposition to the Echo Park Dam and Split Mountain Dam, both of which would be constructed within the Dinosaur National Monument. This opposition arises from persons and organizations interested in the national parks and their desire to preserve such areas in their present natural state. The Under Secretary of the Interior, Mr. Tudor, has made a study of the proposal to build these two particular dams. The Under Secretary has concluded that it is a matter of personal opinion as to the extent of the harm that would be caused by the Echo Park Dam in particular which would create a rather large body of water within the monument, and would appreciably alter its appearance. The Under Secretary, however, concluded that if the dam were built, the beauty of the park would by no means be destroyed and would remain an area of great attraction to many people, and in his report, the Under Secretary called attention to the fact that neither of the proposed reservoirs would flood the portion of the quarry where the dinosaur skeletons had been found. He further stated that, although he shared the concern of those who wanted to preserve the beauties of the Dinosaur National Monument, he believed the conservation of water is of greatest importance. The Under Secretary therefore recommended that the plans for the development of the upper Colorado River Basin include the Echo Park and Split Mountain Dams.

My family and I visited Dinosaur National Monument in the summer of 1947. We had hoped to spend 2 or 3 days, but we saw what we could in 1 day and left. It is indeed a beautiful spot but the

dinosaur remains are high on the hills and will not be inundated. The water would only add to the grandeur of the park, I believe, and I can assure you that had the lake been there in 1947, thus making the canyons more accessible, we would probably have stayed there 2 or 3 days more.

Last fall, one the senior members of our Washington staff also visited the Echo Park Dam site. He reports that, in his opinion, it is located in a remote and most inaccessible area because the road giving entry is poorly marked. He also reports that the lake which would be created by the power dam would not affect the area of the park where the excavations for dinosaur remains have been undertaken.

For these reasons, we disagree with those who oppose the construction of the Echo Park and Split Mountain Dams for esthetic reasons, and in this matter, we are in full agreement on this point with the Under Secretary of the Interior, Mr. Tudor.

TABLE 1.—Estimated yearly energy cost savings to electric co-ops in and adjacent to "principal portion" of Colorado storage project marketing area

State	Name of cooperative	Thousand kilowatt-hours annual energy consumption	Present average rate, mills per kilowatt hour	Present annual cost of energy	Annual cost of energy at 6 mills per kilowatt-hour	Annual savings at rate of 6 mills per kilowatt ¹ hour	
Colorado.....	Grand Valley Rural Power Lines, Inc.....	7	6.62	8.9	58,683	39,720	18,963
	San Luis Valley Rural Electric Co-op.....	14	12.96	8.8	114,099	77,760	36,339
	Gunnison County Electric Association.....	18	1.10	18.0	19,780	6,600	13,180
	Delta-Montrose Rural Power Lines Association.	20	5.52	10.7	59,110	33,120	25,990
	San Miguel Power Association.....	26	11.01	9.1	100,431	66,060	34,371
	La Plata Electric Association.....	32	6.14	9.8	60,310	36,840	23,470
	Empire Electric Association.....	33	10.51	9.8	103,282	63,060	40,222
	Holy Cross Electric Association.....	34	3.07	8.0	24,590	18,420	6,170
	Yampa Valley Electric Association.....	36	3.31	12.0	39,958	19,860	20,098
(¹).....	White River Electric Association.....	40	1.83	17.5	32,501	10,986	21,515
	North Park Rural Electric Association.....	42	.88	7.0	6,185	5,280	905
New Mexico.....	Northern Rio-Arriba Electric Cooperative.....	15	1.87	18.3	34,200	19,860	14,340
Idaho.....	Raft River Electric Co-op.....	16	9.03	5.6	24,021	² 25,920	
Utah.....	Garkane Power Association.....	6	4.30	14.0	60,231	25,800	34,431
(¹).....	Moon Lake Electric Association.....	8	7.81	8.4	65,627	46,860	18,767
Wyoming.....	Riverton Valley Electric Association.....	3	4.46	6.8	² 30,143	² 26,790	
(¹).....	Bridger Valley Electric Association.....	9	2.13	10.9	23,261	12,700	10,481
(¹).....	Lower Valley Power & Light.....		4.48	4.5	² 20,089	² 26,880	
	Total.....		92.3		802,248	483,006	319,242

¹ Generates own power, figures for calendar 1951.

² Not included in total.

NOTE.—Except as noted, figures are for fiscal year 1952 from 14th Annual Report of Energy Purchased by REA Borrowers published by REA.

(Whereupon, at 9:30 a. m., the hearing was recessed subject to call of the Chair.)

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