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TWENTY-THIRD ANNUAL REPORT

OF THE

Upper Colorado River Commission

SALT LAKE CITY, UTAH
SEPTEMBER 30, 1971

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TWENTY-THIRD ANNUAL REPORT

OF THE

Upper Colorado River Commission

SEPTEMBER 30, 1971

SALT LAKE CITY, UTAH

IVAL V. GOSLIN
Executive Director

UPPER COLORADO RIVER BASIN

UPPER COLORADO RIVER
COMMISSION

25 0 25 50
SCALE OF MILES

UPPER COLORADO RIVER COMMISSION

355 South Fourth East Street
Salt Lake City, Utah 84111

October 31, 1971

Mr. President:

The Twenty-Third Annual Report of the Upper Colorado River Commission, as required by Article VIII (d) (13) of the Upper Colorado River Basin Compact, is enclosed.

The budget of the Commission is included in this report as Appendix B.

This report has also been transmitted to the Governor of each State signatory to the Upper Colorado River Basin Compact.

Respectfully yours,

Ival V. Goslin

Ival V. Goslin
Executive Director

The President
The White House
Washington, D. C. 20500

Enclosure

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Contents

Contents — continued

Contents — continued

I. Preface

Article VIII (d) (13) of the Upper Colorado River Basin Compact requires the Upper Colorado River Commission to "make and transmit annually to the Governors of the signatory States and the President of the United States of America, with the estimated budget, a report covering the activities of the Commission for the preceding water year."

Article VIII (1) of the By-Laws of the Commission specifies that "the Commission shall make and transmit annually on or before April 1 to the Governors of the states signatory to the Upper Colorado River Basin Compact and to the President of the United States a report covering the activities of the Commission for the water year ending the preceding September 30."

This Twenty-third Annual Report of the Upper Colorado River Commission has been compiled pursuant to the above directives.

This Annual Report includes, among other things, the following:

Membership of the Commission, its Committees, Advisers, and Staff;

Roster of meetings of the Commission;

Brief discussion of the activities of the Commission;

Engineering and hydrologic data;

Pertinent legal information;

Information pertaining to Congressional legislation;

Maps of Upper Colorado River Basin;

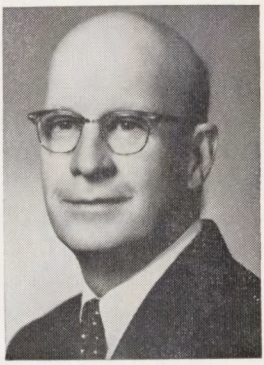
Brief discussion of the Storage Units and participating projects of the Colorado River Storage Project and of the status of their construction or investigations;

Appendices containing:

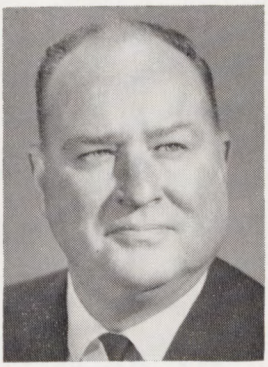
Fiscal data, such as: budget, balance sheet, statements of revenue and expense, etc.;

II. Commission

John A. Love
Commissioner for
Colorado



John H. Bliss
Commissioner for
New Mexico



H. P. Dugan
Chairman
Commissioner for
United States

H. T. Person
Commissioner for
Wyoming

Thorpe
Waddingham
Commissioner for
Utah

III. Officers of the Commission

Chairman, H. P. Dugan

Vice Chairman, John A. Love

Secretary, Ival V. Goslin

Treasurer, I. J. Coury

Assistant Treasurer, William F. Homer

IV. Staff

Ival V. Goslin, Executive Director

Paul L. Billhymer, General Counsel

Mrs. Hanna I. Wetmore, Administrative Secretary

Mrs. Janis J. Smith, Clerk-Typist

V. Committees

The Committees of the Commission convened when required during the year.

Committees and their membership, at the date of this report, are as follows (the Chairman and the Secretary of the Commission are ex-officio members of all committees, Article V (4) of By-Laws):

STANDING COMMITTEES

Engineering Committee

Ival V. Goslin, Chairman
Clarence J. Kuiper
Laren D. Morrill
Stephen E. Reynolds
David P. Hale
Floyd A. Bishop
H. T. Person
George D. Clyde
Daniel F. Lawrence

Legal Committee

Felix L. Sparks, Chairman
Raphael J. Moses
Paul L. Bloom
Claud S. Mann
Clarence A. Brimmer
Jack R. Gage
Dallin W. Jensen
Thomas O. Parker

Budget Committee

John H. Bliss, Chairman
Felix L. Sparks
H. T. Person
Thorpe Waddingham

SPECIAL COMMITTEES

Finance Committee

Norman W. Barlow, Chairman
I. J. Coury
Bert A. Page
Felix L. Sparks

Education and Information Committee

John H. Bliss
Floyd A. Bishop
Lynn S. Ludlow

VI. Advisers to Commission

The following individuals serve as advisers to their respective Commissioners:

UNITED STATES OF AMERICA

Legal

Thomas O. Parker, Acting Regional Solicitor
U. S. Department of the Interior
Salt Lake City, Utah

Engineering

J. R. Riter
Denver, Colorado

COLORADO

Legal

Felix L. Sparks, Director
Colorado Water Conservation Board
Denver, Colorado

Raphael J. Moses, Counsel
Colorado Water Conservation Board
Boulder, Colorado

Engineering

Clarence J. Kuiper
State Engineer
Denver, Colorado

Laren D. Morrill, Deputy Director
Colorado Water Conservation Board
Denver, Colorado

NEW MEXICO

Legal

Claud S. Mann
Special Assistant Attorney General
Albuquerque, New Mexico

Paul L. Bloom
Special Assistant Attorney General
Santa Fe, New Mexico

Engineering

Stephen E. Reynolds, State Engineer
Santa Fe, New Mexico

David P. Hale, Engineer
New Mexico Interstate Stream Commission
Santa Fe, New Mexico

General

I. J. Coury, Chairman
New Mexico Interstate Stream Commission
Farmington, New Mexico

UTAH

Legal

Dallin W. Jensen, Assistant Attorney General
Salt Lake City, Utah

Engineering

George D. Clyde, Consulting Engineer
Salt Lake City, Utah

Daniel F. Lawrence, Director
Division of Water Resources
Salt Lake City, Utah

Colorado River Advisory Committee to Utah Commissioner

Hubert C. Lambert
State Engineer
Salt Lake City, Utah

Lawrence Y. Siddoway, Manager
Uintah Water Conservancy District
Vernal, Utah

Clyde E. Conover, Member
Emery County Water Conservancy District
Ferron, Utah

Clyde Ritchie, Chairman
Central Utah Water Conservancy District
Heber City, Utah

WYOMING

Legal

Jack R. Gage, Special Assistant Attorney General
Cheyenne, Wyoming

Engineering

Floyd A. Bishop, State Engineer
Cheyenne, Wyoming

H. T. Person, Upper Colorado River Commissioner
Laramie, Wyoming

Assistant Commissioners

Joe L. Budd
Big Piney, Wyoming

Norman W. Barlow
Cora, Wyoming

VII. Meetings of the Commission

During the Water Year ended September 30, 1971, the Commission met four times as follows:

Meeting No. 117	February 27, 1971	Adjourned Annual Meeting Salt Lake City, Utah
Meeting No. 118	March 15, 1971	Regular Meeting Salt Lake City, Utah
Meeting No. 119	June 30, 1971	Adjourned Regular Meeting Denver, Colorado
Meeting No. 120	September 20, 1971	Annual Meeting Salt Lake City, Utah

VIII. Activities of the Commission

Within the scope and limitations of Article I (a) of the Upper Colorado River Basin Compact, ". . . to secure the expeditious agricultural and industrial development of the Upper Basin, the storage of water . . ." and under the powers conferred upon the Commission by Article VIII (d) pertaining to making studies of water supplies of the Colorado River and its tributaries and the power to ". . . do all things necessary, proper or convenient in the performance of its duties . . . , either independently or in cooperation with any state or federal agency," the principal activities of the Commission during the 1971 water year have consisted of: (A) research and studies of an engineering and hydrologic nature of various phases of the water resources of the Colorado River Basin; (B) collection and compilation of documents for a legal department library relating to the utilization of waters of the Colorado River System for domestic, industrial, agricultural purposes and the generation of hydroelectric power, and legal analysis of associated laws, reports, and problems; (C) research of data and development of facts and argument for use by States and other defendant parties in the Rainbow Bridge lawsuit, *Friends of the Earth, et al.* v. *Secretary of the Interior, et al.;* (D) a public relations program designed to disseminate to the general public the true facts concerning the operation of Glen Canyon Dam and Lake Powell and alleged damages to Rainbow Bridge; (E) cooperation with water quality and water resource agencies of the Colorado River Basin States, Bureau of Reclamation and other federal agencies in the development of a salinity control policy and action program to control the salinity of the Colorado River system; (F) an education and information program designed to aid in securing appropriations of funds by the United States Congress for the construction, planning and investigation of storage dams, reservoirs, and water resource development projects of the Colorado River Storage Project that have been authorized for construction, and to secure authorization by the Congress for the construction of additional participating projects as the essential investigations and planning are completed; and (G) a legislative program consisting of the analysis and study of water resource Bills introduced in the U.S. Congress for enactment, the preparation of evidence and argument, and the presentation of testimony before Committees of the Congress.

A. ENGINEERING — HYDROLOGY

1. Type I — Comprehensive Framework Study — Upper Colorado Region

With the concurrence of Federal and State agencies, and with the approval of the Upper Colorado River Commission, the Commission's staff assumed leadership in initiating and coordinating a comprehensive Type I Framework Study of the water and related land resources of the Upper Colorado Region which embraces the Upper Colorado River Basin. This study is one of four regional studies made in the Pacific Southwest assigned to the Pacific Southwest Inter-Agency Committee by the Water Resources Council that was created by the Water Resources Planning Act of 1965 (79 Stat. 244). The Commission's staff worked in cooperation with representatives of twenty related agencies and the five Upper Basin States.

The Type I Framework Study Report for the Upper Colorado Region with sixteen appendices was completed during the 1971 water year. Distribution of all available copies of these documents has virtually been completed by the Commission office and the Bureau of Reclamation.

2. Other Upper Colorado River Basin Studies

Because the Colorado River Storage Project is a water resources development plan of the Upper Colorado River Basin, the Upper Colorado River Commission has determined that active participation in investigations, studies and plans related to the present and future construction and operation of water-regulating, water-diversion, power-generating, and water-utilization facilities is both necessary and expedient. The Commission has a primary duty to the four Upper Division States to do all things necessary to protect the interests of its member States in the water resources of the Colorado River and to aid the best and most expeditious development of those resources. In fulfilling this responsibility, the Commission's staff has been actively engaged during the past year in making many hydrologic and engineering studies relative to the utilization and distribution of the water resources of the Upper Colorado River Basin.

3. Colorado River Salinity Problem

During the past year considerable effort has been devoted to preliminary investigations of salinity control measures in the Colorado River Basin. The Commission's staff participated in field inspections of several of the principal natural sources of salt loading in the Basin, and has been instrumental in aiding the initiation of feasibility studies of methods to control these sources of salinity and in the establishment of an overall salinity control program for the Colorado River system. These activities have been performed under the direction and guidance of the Commission as expressed in the two following resolutions unanimously adopted on June 30, 1971.

RESOLUTION

by

UPPER COLORADO RIVER COMMISSION

re:

Control of Salinity of Colorado River

June 30, 1971

WHEREAS, the Upper Colorado River Commission continues to defend the rights in perpetuity of the States of the Upper Division of the Colorado River Basin to fully develop their water and related land resources under the terms of the Colorado River Compact and the Upper Colorado River Basin Compact; and

WHEREAS, said Commission recognizes the growing importance of the salinity problems of the Colorado River as the remaining amount of unused water diminishes in quantity; and

WHEREAS, it appears that importation of water from other drainage basins into the Colorado River System will not be materialized until well after the year 2000 and salinity problems of major proportions will be encountered by 1980, if water use progresses as projected; and

WHEREAS, each of the Colorado River Basin States is supporting the appropriation of funds by the U.S. Congress for feasibility studies by the U.S. Bureau of Reclamation of salt load reduction projects; and

WHEREAS, the Colorado River is an international stream as well as an interstate stream; and

WHEREAS, it is in the best interests of the United States and the States of the Colorado River Basin to effectuate a program at Federal expense to alleviate salinity conditions in the Colorado River Basin by methods that are applicable to specific salinity control projects:

NOW, THEREFORE, BE IT RESOLVED by the Upper Colorado River Commission that it (a) urges that the U.S. Bureau of Reclamation immediately review the available reconnaissance studies of salinity control measures and initiate feasibility studies of projects that appear justified from the reconnaissance data; (b) urges the President, the Office of Management and Budget, the Department of the Interior, and the Congress to support the authorization

and adequate funding of Bureau of Reclamation salinity control projects for the Colorado River Basin:

BE IT FURTHER RESOLVED that the staff of the Upper Colorado River Commission is hereby authorized and directed to work closely with representatives of the Commission's member States in coordinating and correlating activities with other States and Federal agencies in attaining the objectives of this resolution and protecting the interests of the Upper Division States in the full development of their compact apportionments of water;

BE IT FURTHER RESOLVED that copies of this resolution be transmitted to the President of the United States, members of the Appropriation Committees of the U.S. House of Representatives and U.S. Senate, Director of the Office of Management and Budget, Secretary of the Interior, Members of Congress and Governors of the Colorado River Basin States, Commissioner of Reclamation, and other interested entities.

CERTIFICATE

I, IVAL V. GOSLIN, Executive Director of the Upper Colorado River Commission, do hereby certify that the above Resolution was unanimously adopted by the Upper Colorado River Commission at an Adjourned Regular Meeting held at Denver, Colorado on June 30, 1971.

WITNESS my hand this 1st day of July, 1971.

/s/ Ival V. Goslin
Ival V. Goslin
Executive Director

RESOLUTION

by

UPPER COLORADO RIVER COMMISSION

re:

Draft Report Entitled, The Mineral Quality Problem In The Colorado River Basin By Federal Water Quality Administration

June 30, 1971

WHEREAS, on August 8, 1962, the Upper Colorado River Commission unanimously adopted a resolution favoring "a study of any and all measures for the reduction of the salinity of Colorado River waters delivered for use in the Republic of Mexico"; and

WHEREAS, on September 21, 1967, said Commission, after having been informed that the Federal Water Pollution Control Administration had proposed that quantitative criteria for total dissolved solids be set at various points in the Colorado River system based on an upper limit of 1000 mg/l at Imperial Dam, unanimously adopted another resolution stating that: "water quality criteria on the Colorado River should not preclude or interfere with the reasonable use of water in the Upper Basin within the terms of the Colorado River Compact"; and

WHEREAS, in April 1971, the Environmental Protection Agency transmitted to the States of the Colorado River Basin a preliminary draft of Summary Report on "The Mineral Quality Problem In The Colorado River Basin" prepared under the jurisdiction of the Federal Water Quality Administration of the Department of the Interior, and requested comments thereon; and

WHEREAS, said Summary Report constitutes only a reconnaissance step toward the solution of the mineral quality problem of the Colorado River system, and lacks sufficient information to assure that numerical salinity control standards would be equitable, workable, and enforceable; and

WHEREAS, said Summary Report contains certain recommendations including a recommendation that numerical salinity criteria of 1000 mg/l monthly average at Imperial Dam and 800 mg/l monthly average at Hoover Dam be implemented at this time. This recommendation is diametrically opposed to previously stated poli-

cies of the Upper Colorado River Commission and the major purpose of the Upper Colorado River Basin Compact "to secure the expeditious agricultural and industrial development of the Upper Basin, . . .":

NOW, THEREFORE, BE IT RESOLVED by the Upper Colorado River Commission that:

(1) any broad policy objective pertaining to salinity control for the entire Colorado River system must treat the salinity problem as a basinwide problem that needs to be solved to maintain Lower Basin water quality reasonably near present levels while the Upper Basin continues to develop its compact-apportioned water and must recognize that water quality may be degraded until control measures become operable;

(2) numerical salinity control criteria should not be established until salt load reduction projects have been constructed and their operation proved practicable;

(3) the consumptive use of water in salinity control projects must be charged to the beneficiaries of those salinity control projects;

(4) the Bureau of Reclamation should be assigned the primary responsibility for feasibility investigations, planning, and implementing a basinwide salt load reduction program at Federal expense in recognition of the major responsibilities of the United States with respect to the Colorado River as an interstate and international stream; and

(5) the member States of the Upper Colorado River Commission should cooperate with the three lower Colorado River Basin States and the Federal government in the resolution of the mineral quality problem of the Colorado River System.

BE IT FURTHER RESOLVED that the Environmental Protection Agency be commended for making available copies of the Summary Report on "The Mineral Quality Problem In The Colorado River Basin" for review by interested agencies of the seven Colorado River Basin States; and

BE IT FURTHER RESOLVED that copies of this resolution be transmitted to the Administrator of the Environmental Protection Agency, Secretary of the Interior, Governors and Members of the Congress of the Colorado River Basin States, Commissioner of Reclamation, and other interested entities.

CERTIFICATE

I, IVAL V. GOSLIN, Executive Director of the Upper Colorado River Commission, do hereby certify that the above Resolution was unanimously adopted by the Upper Colorado River Commission at an Adjourned Regular Meeting held at Denver, Colorado on June 30, 1971.

WITNESS my hand this 2nd day of July, 1971.

/s/ Ival V. Goslin
Ival V. Goslin
Executive Director

The Upper Colorado River Commission on behalf of its member States has consistently endeavored to maintain a sound policy pertaining to salinity problems and the development, utilization, and conservation of the water resources of the Upper Colorado River Basin. Appendix C of this report contains resolutions adopted in 1962 and 1967 concerning the reduction of salinity and the establishment of water quality criteria for the Colorado River system.

*APRIL 1, 1971 FORECASTS OF APRIL-JULY INFLOWS TO LAKE POWELL**

Agency	*Acre-Feet*
Soil Conservation Service Department of Agriculture	7,275,000
National Weather Service Department of Commerce	8,200,000
Bureau of Reclamation Department of the Interior	7,500,000

The reconstructed inflow to Lake Powell for the period April-July 1971, amounted to 8,378,000 acre-feet.**

During the April-July 1971 period storage of water in Colorado River Storage Project reservoirs above Lake Powell amounted to 2,050,000 acre-feet of which 59,000 acre-feet evaporated and 180,000 acre-feet went into bank storage.*** Excluding bank storage and evaporation, Fontenelle Reservoir stored 168,000 acre-feet; Blue Mesa 314,000 acre-feet; Morrow Point 2,000 acre-feet; Flaming Gorge 1,168,000 acre-feet; and Navajo Reservoir –159,000 acre-feet.

Actual inflow to Lake Powell for the period April-July 1971 was 6,327,000 acre-feet.**

The virgin flow of the Colorado River at Lee Ferry for the 1971 water year amounted to 14.9 million acre-feet.****

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*Including water to be stored upstream in other Colorado River Storage Project Reservoirs.

**Exclusive of evaporation and seepage losses.

***Including Fontenelle Reservoir on Green River in Wyoming.

****Provisional records subject to revision.

5. Reservoir Operations

Runoff during the spring of 1971 was again slightly less than normal. Lake Powell rose to elevation 3622.34 feet (content 14,489,-000 acre-feet) above mean sea level on July 11, 1971 and receded to elevation 3614.25 feet (content 13,609,000 acre-feet) by the end of the water year on September 30, 1971. At elevation 3622.34 feet on July 11, 1971 Lake Powell was 20.6 feet above its high point in 1970.

Lake Mead at the end of water year 1970-1971 contained 16,886,000 acre-feet* of available storage at elevation 1153.61. Lake Mead held 3.23 million acre-feet in the 30.8 feet above its rated head.

The results of the long-range reservoir operation procedures adopted by the Secretary of the Interior for Lake Powell, Flaming Gorge, Navajo and Blue Mesa and Morrow Point Reservoirs in the Upper Colorado River Basin and for Lake Mead in the Lower Basin are illustrated in the graphs on the following pages for the 1971 water year.

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*Based on April 1, 1967 Capacity Table revised according to Sedimentation Survey 1963-64.

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN

(Units: Elevation — feet; capacity — 1,000 acre-feet)

UPPER BASIN

Colorado River Storage Project

(Total Surface Capacity)

	Flaming Gorge		Navajo		Lake Powell		Blue Mesa		Morrow Point		Fontenelle	
	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.
River elevation at dam (average tailwater)	5,603	0	5,720	0	3,138	0	7,160	0	6,775	0	—	—
Dead Storage	5,740	40	5,882.5	175	3,370	1,998	7,358	111	6,808	0	6,408	0.56
Inactive Storage (minimum power pool)	5,871	273	5,990[1]	673	3,490	6,124	7,393	192	7,100	75	—	—
Rated Head	5,946	1,102	—	—	3,570	11,426	7,438	361	7,108	80	6,491	234
Maximum Storage (without surcharge)	6,040	3,789	6,085	1,709	3,700	27,000	7,519	941	7,160	117	6,506	345

[1]Required for Navajo Indian Irrigation Project

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN

(Units: Elevation — feet; capacity — 1,000 acre-feet)

LOWER BASIN

(Usable Surface Capacity)

	Lake Mead		Lake Mohave		Lake Havasu	
	Elev.	Capacity	Elev.	Capacity	Elev.	Capacity
River elevation at dam (average tailwater)	646	(-2,378)	506	(-8.5)	370	(-28.6)
Dead Storage	895	0	533.39	0	400	0
Inactive Storage (minimum power pool)	1,050	7,471	570	217.5	440[1]	439.4
Rated Head	1,122.8	13,633	—	—	—	—
Maximum Storage (without surcharge)	1,221.4	26,159	647	1,809.8	450	619.4

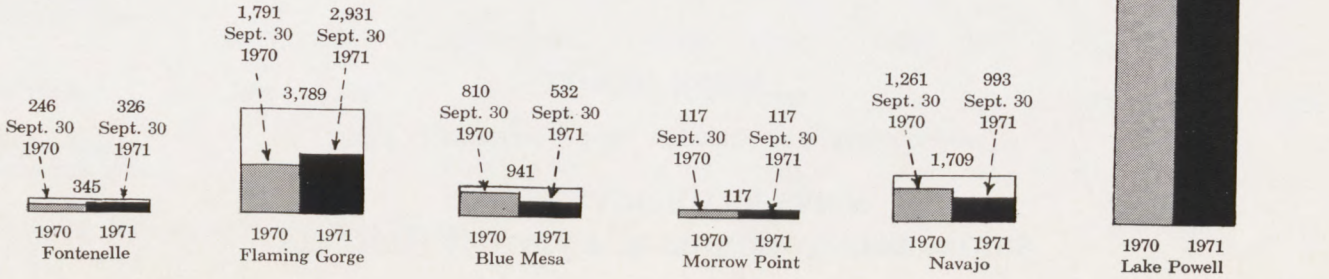
[1]Contractual minimum for delivery to Metropolitan Water Ditsrict's Colorado River Aqueduct.

STORAGE IN PRINCIPAL RESERVOIRS AT END OF WATER YEAR

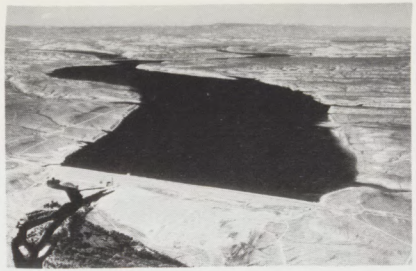
UPPER BASIN

TOTAL STORAGE CONTENTS*
(1,000 Acre-Feet)

RESERVOIR	Sept. 30, 1970	Percent of Capacity	Sept. 30, 1971	Percent of Capacity	Change in Contents
Fontenelle	246	71	326	94	+ 80
Flaming Gorge	1,791	47	2,931	77	+1140
Blue Mesa	810	86	532	57	— 278
Morrow Point	117	100	117	100	0
Navajo	1,261	73	993	58	— 268
Lake Powell	12,039	45	13,609	50	+1570
Total	16,264	(48)	18,508	(54.6)	+2244

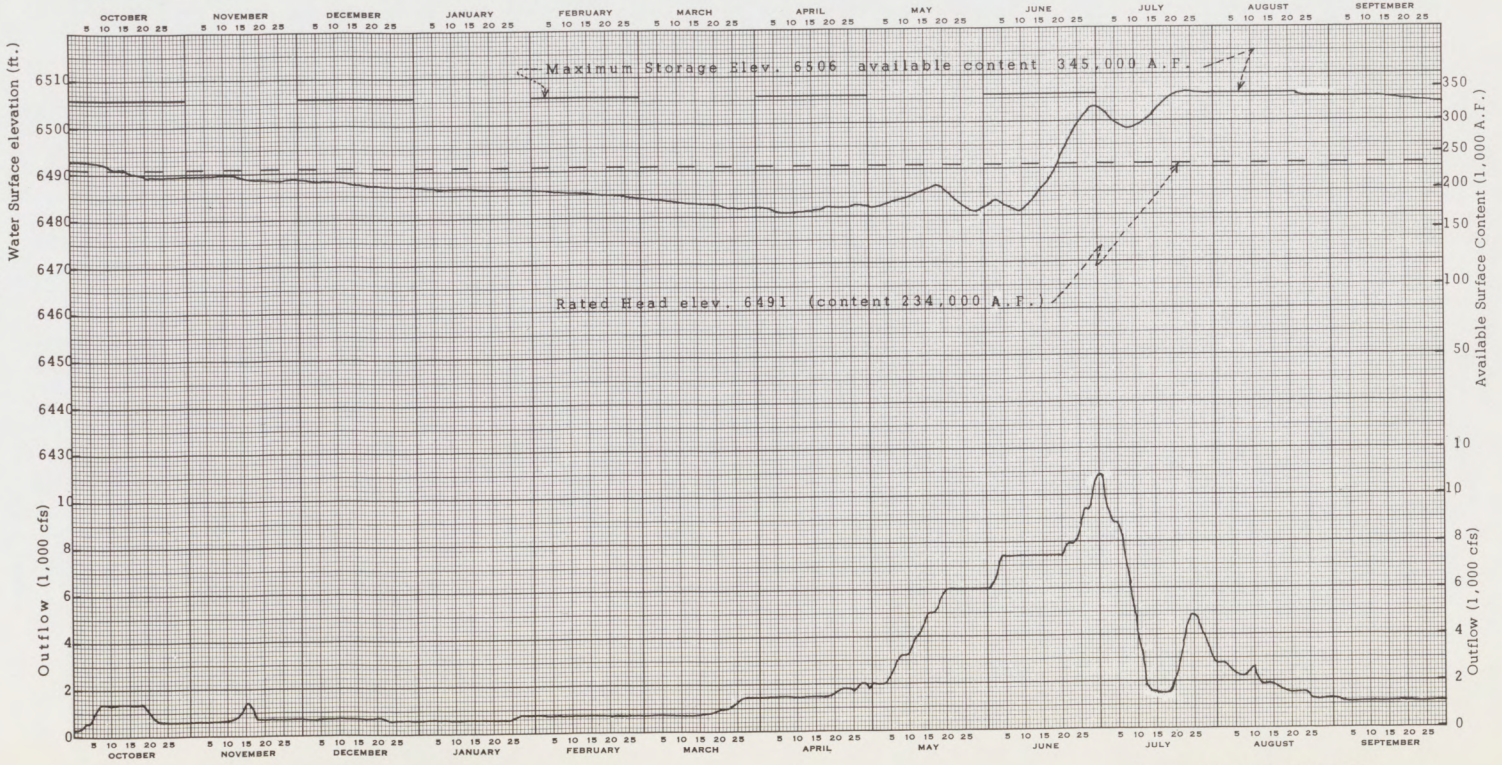


*Excludes Bank Storage

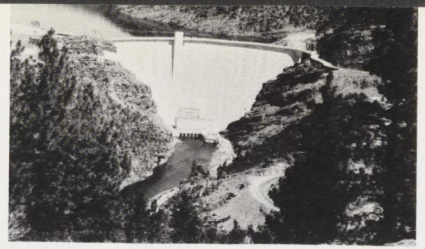


FONTENELLE

Storage Capacity — 345,000 acre-feet
Power Generating Capacity — 10,000 KW
Water in Storage 9/30/71 — 326,500 acre-feet

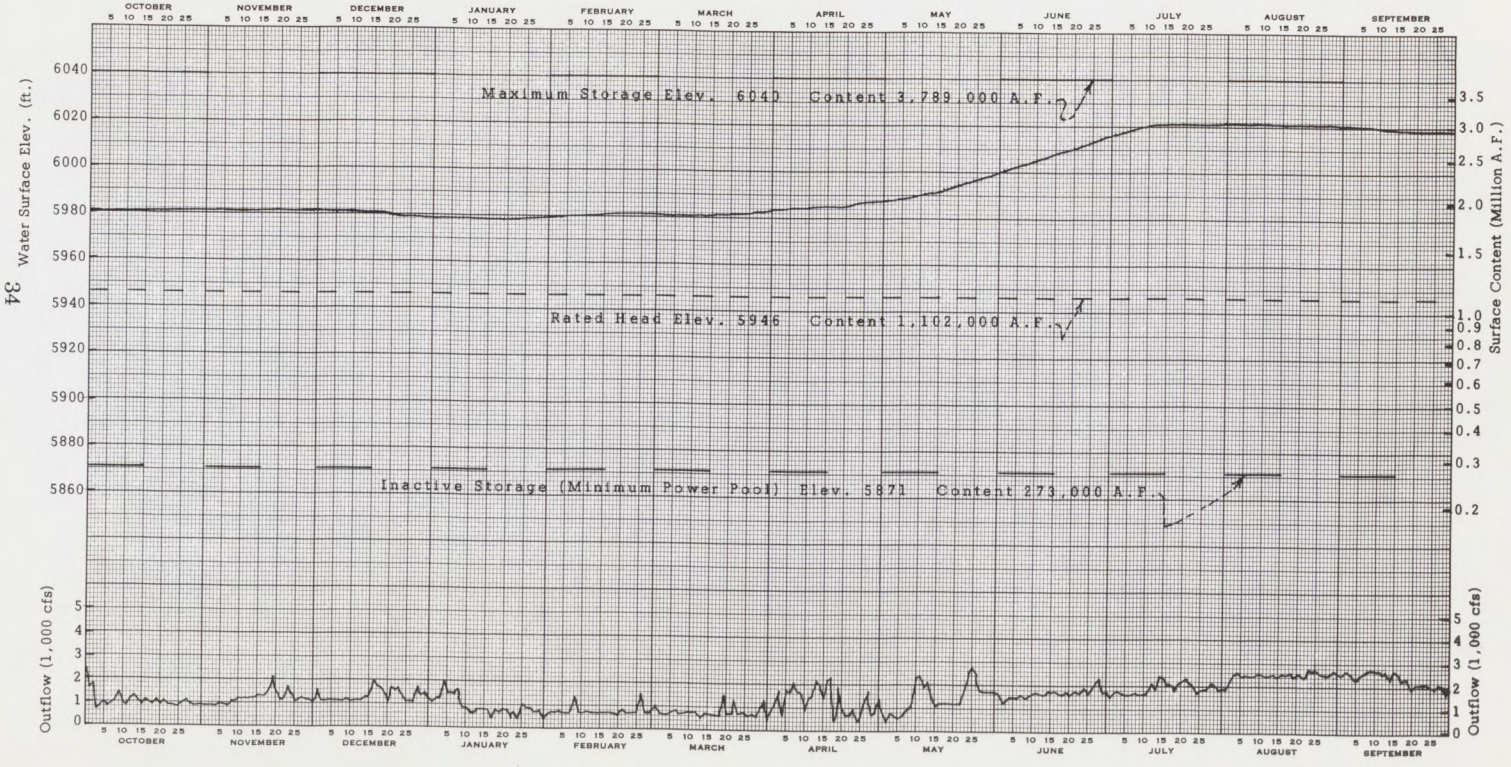


FONTENELLE RESERVOIR
Water Year 1970-1971



FLAMING GORGE

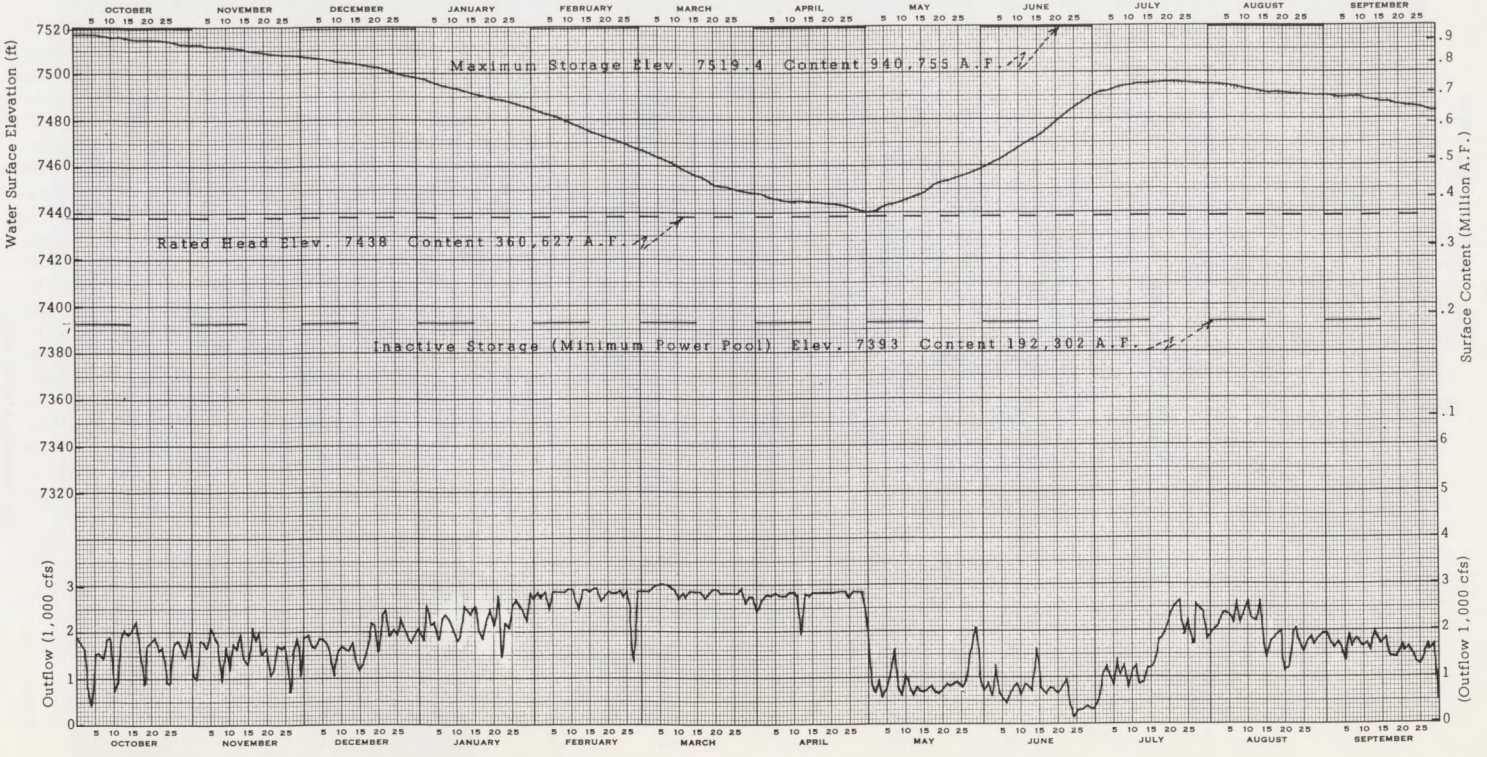
Storage Capacity — 3,789,000 acre-feet
Power Generating Capacity — 108,000 KW
Water in Storage 9/30/71 — 2,931,000 acre-feet



FLAMING GORGE RESERVOIR
Water Year 1970-1971

BLUE MESA

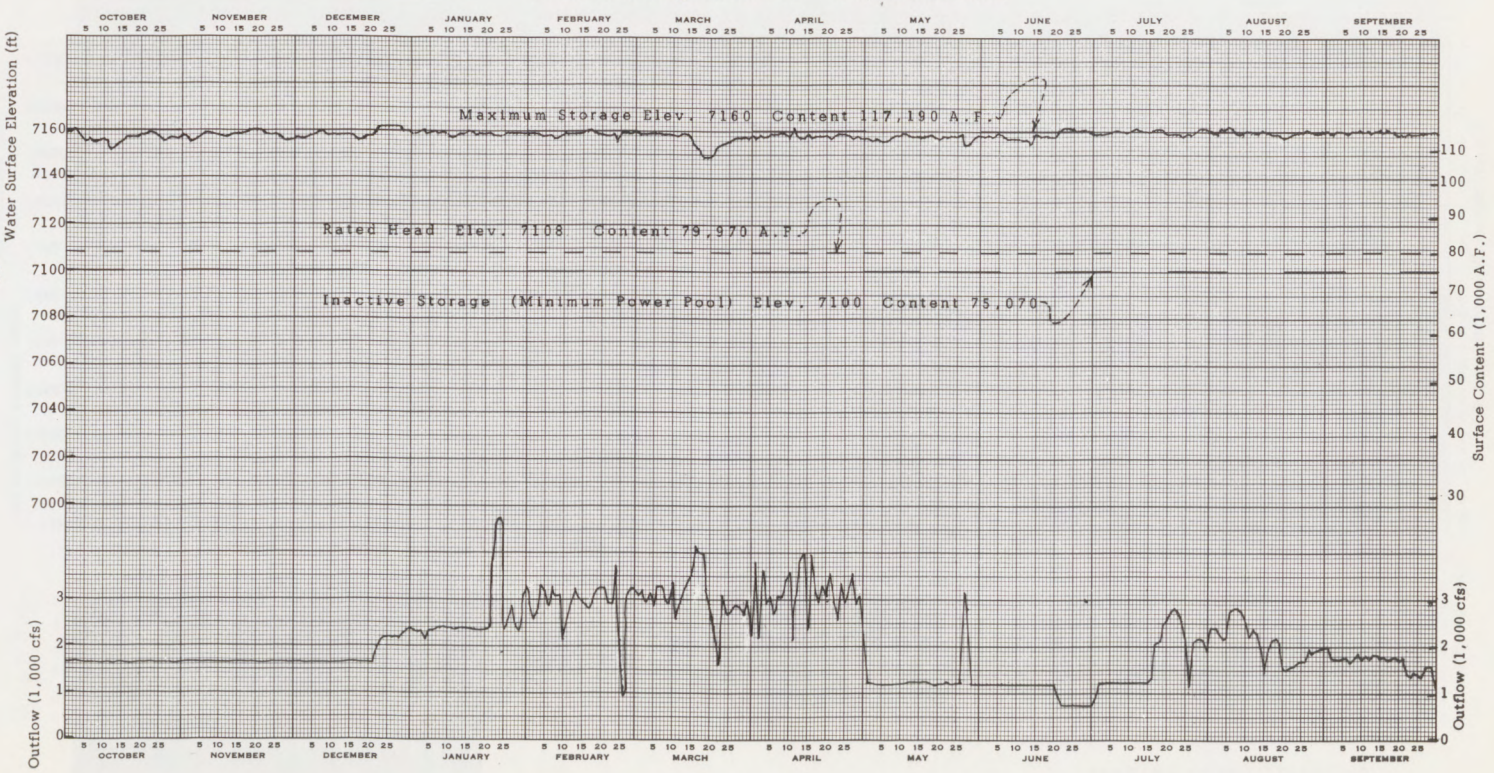
Storage Capacity — 941,000 acre-feet
Power Generating Capacity — 60,000 KW
Water in Storage 9/30/71 — 532,000 acre-feet



BLUE MESA RESERVOIR
Water Year 1970-1971

MORROW POINT

Storage Capacity — 117,000 acre-feet
Power Generating Capacity — 120,000 KW
Water in Storage 9/30/71 — 116,600 acre-feet

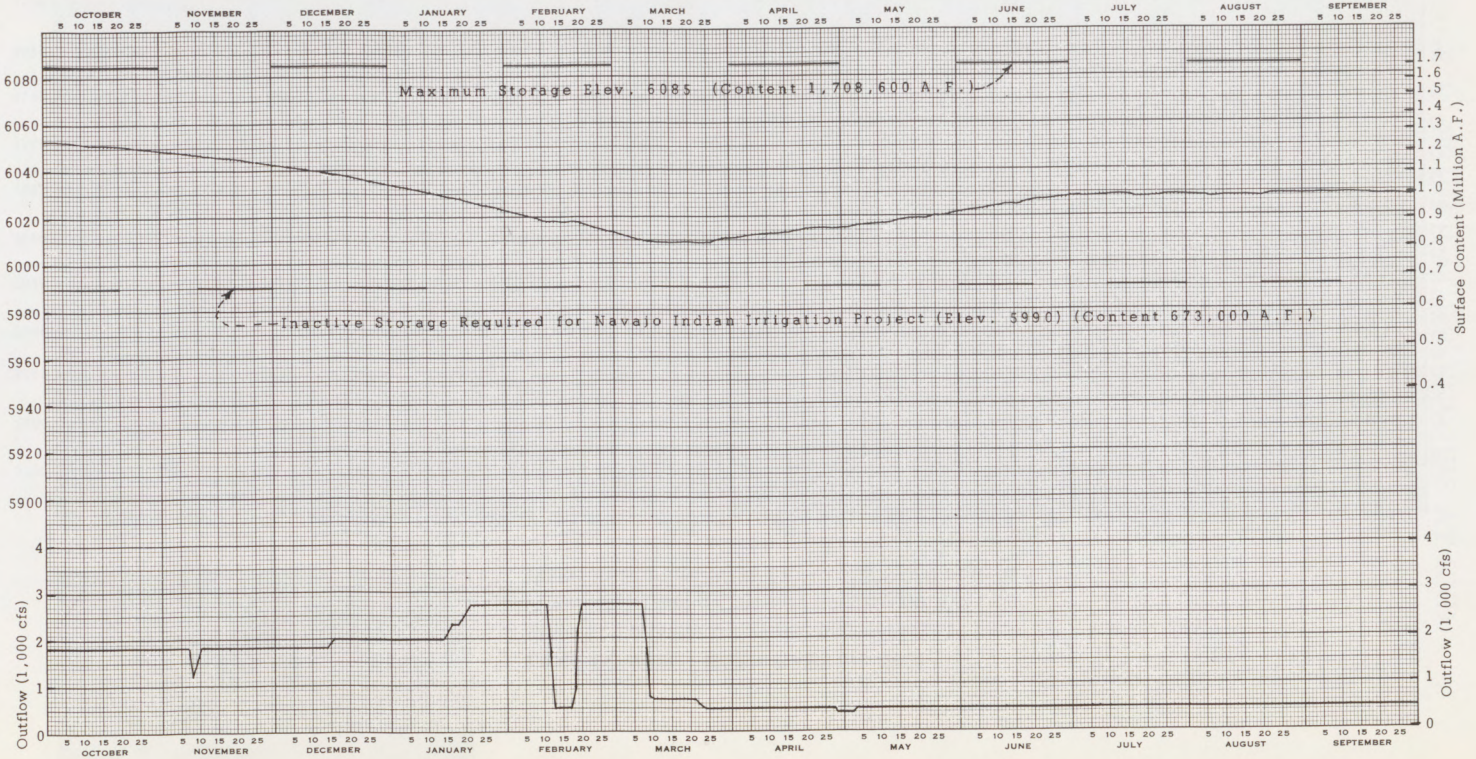


MORROW POINT RESERVOIR
Water Year 1970-1971

MORROW POINT RESERVOIR
Water Year 1970-1971

NAVAJO

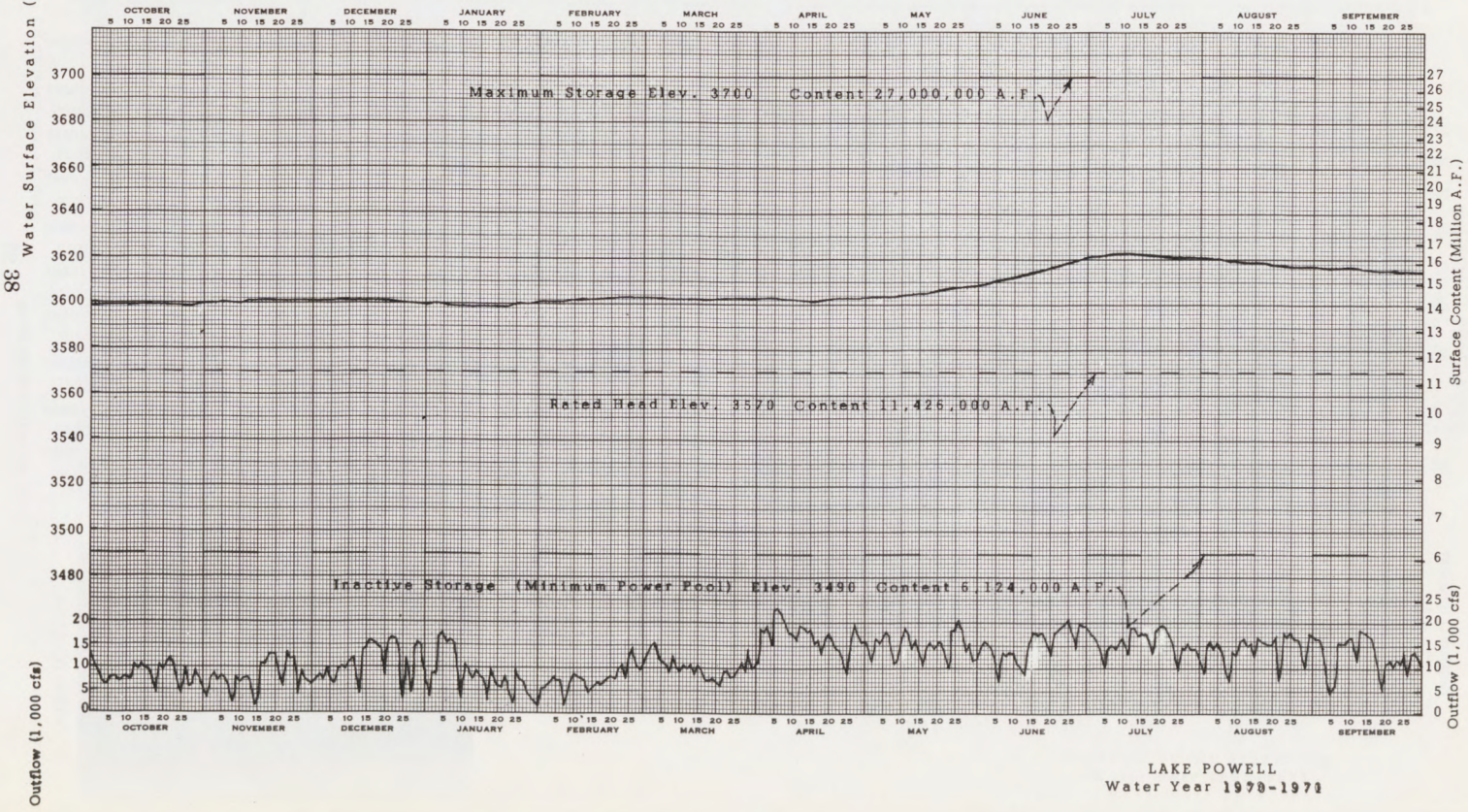
Storage Capacity — 1,709,000 acre-feet
Power Generating Capacity — 0
Water in Storage 9/30/71 — 993,200 acre-feet



NAVAJO RESERVOIR
Water Year 1970-1971

LAKE POWELL - GLEN CANYON DAM

Storage Capacity — 27,000,000 acre-feet
Power Generating Capacity — 950,000 KW
Water in Storage 9/30/71 — 13,609,000 acre-feet



LAKE POWELL
Water Year 1970-1971

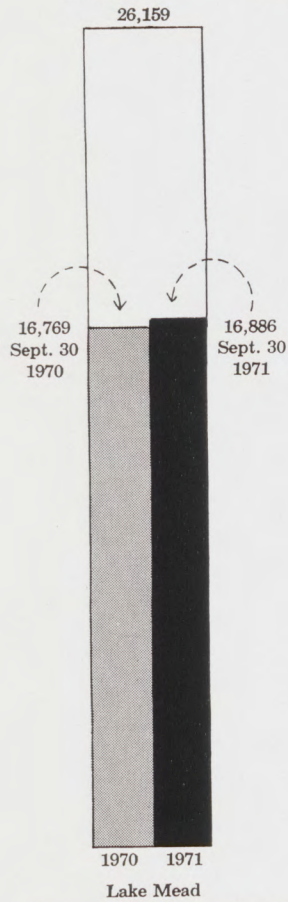
STORAGE IN PRINCIPAL RESERVOIRS AT END OF WATER YEAR

LOWER BASIN

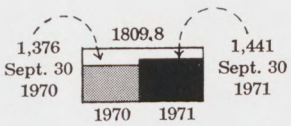
USABLE STORAGE CONTENTS

(1,000 Acre-Feet)

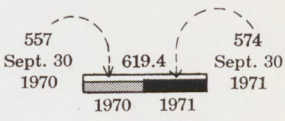
RESERVOIR	Sept. 30, 1970	Percent of Capacity	Sept. 30, 1971	Percent of Capacity	Change in Contents
Lake Mead*	16,769	64	16,886	65	+ 117
Lake Mohave	1,376	76	1,441	80	+ 65
Lake Havasu	557	90	574	93	+ 17
Total	18,702	(65)	18,901	(66)	+ 199



Lake Mead



Lake Mohave



Lake Havasu

*Contents based on April 1967 revised capacity tables according to 1963-64 sedimentation survey at Lake Mead.

LAKE MEAD - HOOVER DAM

Storage Capacity — 26,159,000 acre-feet
Power Generating Capacity — 1,344,800 KW
Water in Storage 9/30/71 — 16,886,000 acre-feet

LAKE MEAD
Water Year 1970-1971

6. Flows of Colorado River

Table VII (a) on pages 42 & 43 shows in column (3) the virgin flow* of the Colorado River at Lee Ferry, Arizona** as estimated at the end of each water year from 1896 to 1971. Column (4) shows the average virgin flow from any given year within the period computed through water year 1971. Column (5) shows the average virgin flow for each progressive period of ten years beginning with the 10-year period ending on September 30, 1905.

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*virgin flow=estimated flow of the stream if it were in its natural state and unaffected by the activities of man.

**Lee Ferry, Arizona is the division point between the upper and lower basins of the Colorado River as defined in the Colorado River Compact. It is located about one mile upstream from the mouth of the Paria River and about 16 miles downstream from Glen Canyon Dam.

TABLE VIII (a)

ESTIMATED VIRGIN FLOW AT LEE FERRY

(million acre-feet)

(1) *Years to 1971*	(2) *Year Ending Sept. 30*	(3) *Estimated Virgin Flow*	(4) *Average to 1971*	(5) *Progressive 10-year Running Average*
76	1896	10.1	14.8	
75	97	18.0	14.9	
74	98	13.8	14.8	
73	99	15.9	14.9	
72	1900	13.2	14.8	
71	01	13.6	14.9	
70	02	9.4	14.9	
69	03	14.8	15.0	
68	04	15.6	15.0	
67	05	16.0	15.0	14.0
66	06	19.1	14.9	14.9
65	07	23.4	14.9	15.5
64	08	12.9	14.8	15.4
63	09	23.3	14.8	16.1
62	1910	14.2	14.6	16.2
61	11	16.0	14.6	16.5
60	12	20.5	14.6	17.6
59	13	14.5	14.5	17.6
58	14	21.2	14.5	18.1
57	15	14.0	14.4	17.9
56	16	19.2	14.4	17.9
55	17	24.0	14.3	18.0
54	18	15.3	14.2	18.2
53	19	12.5	14.1	17.1
52	1920	22.0	14.2	17.9
51	21	23.0	14.0	18.6
50	22	18.3	13.8	18.4
49	23	18.3	13.7	18.8
48	24	14.2	13.6	18.1
47	25	13.0	13.6	18.0
46	26	15.9	13.6	17.6
45	27	18.6	13.6	17.1
44	28	17.3	13.5	17.3
43	29	21.4	13.4	18.2
42	1930	14.9	13.2	17.5
41	31	7.8	13.2	16.0
40	32	17.2	13.3	15.9
39	33	11.4	13.2	15.2

TABLE VIII (a) — continued

ESTIMATED VIRGIN FLOW AT LEE FERRY
(million acre-feet)

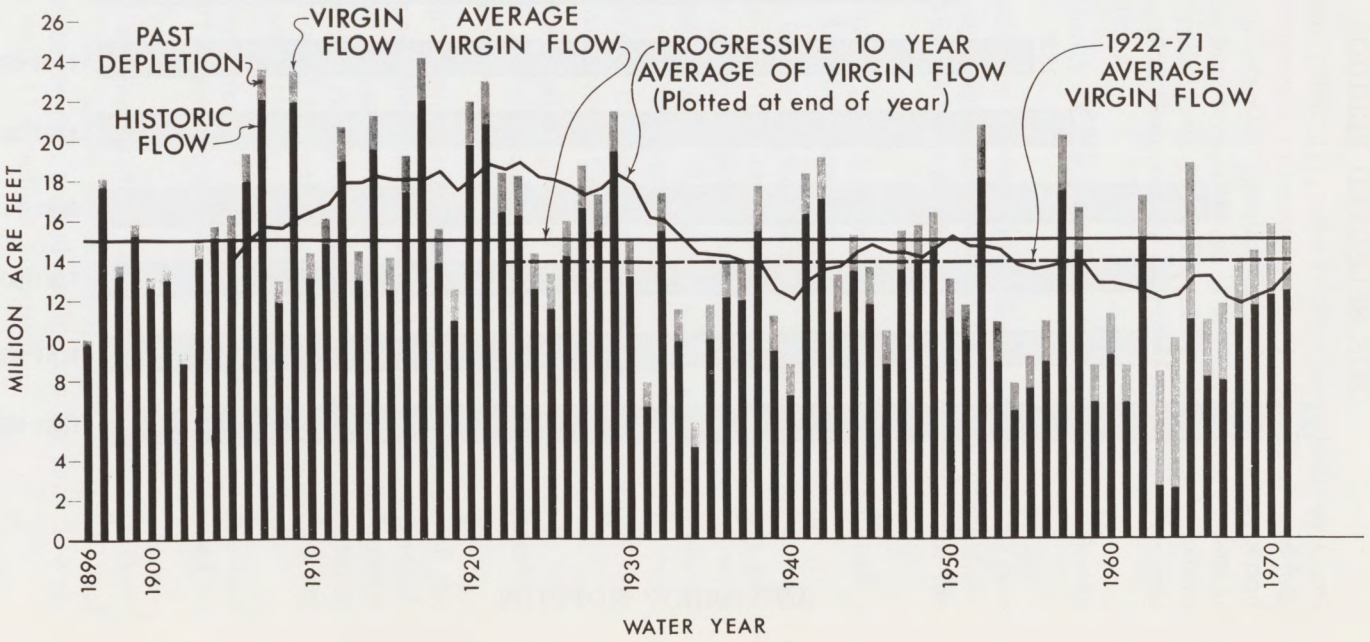
(1)	(2)	(3)	(4)	(5)
Years to 1971	*Year Ending Sept. 30*	*Estimated Virgin Flow*	*Average to 1971*	*Progressive 10-year Running Average*
38	1934	5.6	13.2	14.3
37	35	11.5	13.4	14.2
36	36	13.8	13.5	14.0
35	37	13.7	13.5	13.5
34	38	17.5	13.5	13.5
33	39	11.1	13.4	12.5
32	1940	8.6	13.4	11.8
31	41	18.1	13.6	12.8
30	42	19.1	13.4	13.0
29	43	13.1	13.2	13.2
28	44	15.2	13.2	14.2
27	45	13.4	13.2	14.4
26	46	10.4	13.2	14.0
25	47	15.5	13.3	14.2
24	48	15.6	13.2	14.0
23	49	16.4	13.1	14.5
22	1950	12.9	12.9	15.0
21	51	11.6	12.9	14.3
20	52	20.7	13.0	14.5
19	53	10.6	12.6	14.2
18	54	7.7	12.7	13.5
17	55	9.2	13.0	13.1
16	56	10.7	13.2	13.1
15	57	20.1	13.4	13.5
14	58	16.5	12.9	13.6
13	59	8.6	12.7	12.9
12	1960	11.3	13.0	12.7
11	61	8.5	13.2	12.4
10	62	17.3	13.6	12.1
9	63	8.5	13.2	11.8
8	64	10.2	13.8	12.1
7	65	18.9	14.3	13.1
6	66	11.2	13.6	13.1
5	67	11.9	14.0	12.3
4	68	13.6	14.6	12.0
3	69	14.4	14.9	12.6
2	1970	15.3	15.1	13.0
1	71	14.9*	14.9	13.6

*Provisional records subject to revision

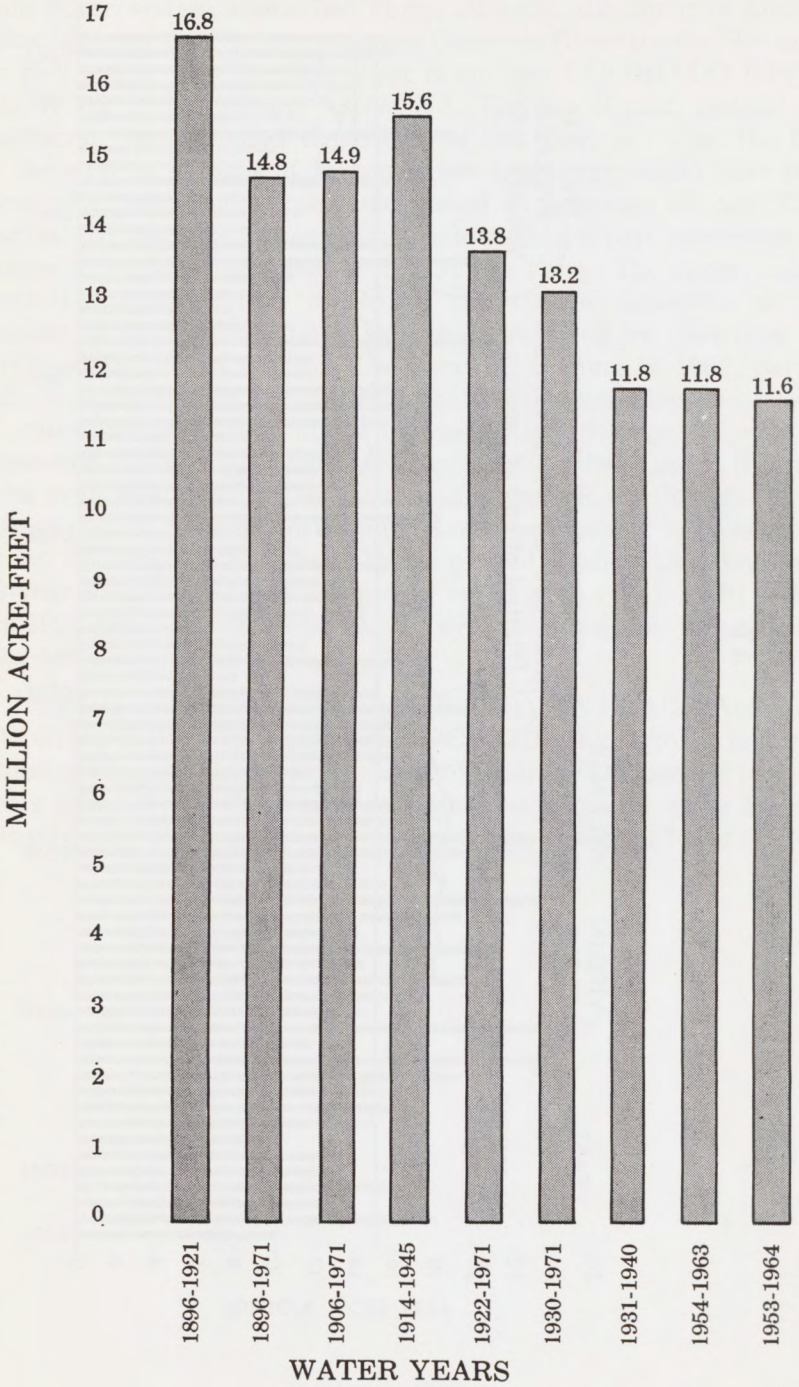
The next two charts illustrate some of the pertinent historical facts related to the amounts of water produced by the Colorado River system above Lee Ferry, Arizona, the compact division point between the Upper and Lower Colorado River Basins. See maps on p. 3 and p. 53. The first chart is entitled COLORADO RIVER FLOW AT LEE FERRY, ARIZONA. The top of each vertical bar represents the estimated virgin flow of the river, i.e., what the flow of the river in millions of acre-feet past Lee Ferry would have been for a given year had it been undepleted by activities of man. Each vertical bar has two components. The lower black part represents the estimated or measured historic flow at Lee Ferry. The upper, lighter vertical-hatched portion represents the stream depletion, or the amount of water estimated to have been removed by man from the virgin supply upstream from Lee Ferry. Beginning in 1962, part of this depletion at Lee Ferry was caused by the retention and storage of water in storage units of the Colorado River Storage Project. The horizontal line (at approximately 15 million acre-feet) shows the long-term average virgin flow. Because the Colorado River Compact is administered on the basis of running averages covering periods of ten years, the irregular horizontal line is plotted to show the progressive 10-year average virgin flows. In only one decade (1941-1950) following 1923 has the progressive 10-year average virgin flow exceeded the long-term virgin flow.

The second chart entitled LEE FERRY AVERAGE ANNUAL VIRGIN FLOW FOR SELECTED PERIODS is a pictorial representation of averages for several periods of records. The periods of water years selected were those to which reference is usually made for various purposes in documents pertaining to the Colorado River System.

COLORADO RIVER FLOW AT LEE FERRY, ARIZONA



LEE FERRY AVERAGE ANNUAL VIRGIN FLOW FOR SELECTED PERIODS



Several important hydrologic facts are apparent from these two charts:

(1) For the period 1896-1921, prior to the Colorado River Compact of 1922, the average was estimated to be 16.8 million acre-feet per year, which is considerably greater than for any other period selected, including the long-term average. A stream gaging station at Lee Ferry was not installed until 1921. Therefore, the annual flows at Lee Ferry prior to the 1922 Compact are estimates based upon records obtained at other stations.

(2) A great majority of the high flows indicated were prior to 1929.

(3) In only one decade (1941-1950) following 1923 has the progressive 10-year average virgin flow exceeded the average virgin flow. The trend for 48 years has been downward as can be seen from the first chart.

(4) For the longest period shown, 1896-1971, the estimated annual average is 14.8 million acre-feet.

(5) For the next longest period, 1906-1971, the estimated annual average virgin flow is 14.95 million acre-feet. Many of the early records for this series of years, as well as for the 1896-1971 period were based upon the estimates of flows made at other gaging stations as mentioned in (1) above. This average has the same numerical value as that used (1906-67) as the basis for justification of a water supply for the recently authorized Central Arizona Project.

(6) The average annual virgin flow for 1914-45 amounts to 15.6 million acre-feet. This is the period of record used by the negotiators of the Upper Colorado River Basin Compact of 1948.

(7) For 1922-1971, the total period since the signing of the Colorado River Compact, the annual average is 13.8 million acre-feet. Records for this series of years are based upon actual measurements of flows at Lee Ferry, the gaging station there having been installed in 1921. The general trend throughout almost this entire period has been toward a decreasing 10-year running average virgin flow.

(8) The downward trend is further demonstrated by the fact that for the 1930-1971 period the annual average had dropped to 13.2 million acre-feet.

(9) Two completely unrelated 10-year periods of minimum flows have occurred since 1930. These are series of years 1931-1940 and 1954-1963 for which the average annual virgin flow for *each* 10-year period amounted to only 11.8 million acre-feet.

(10) The annual average virgin flow for a 12-year period, 1953-1964, amounted to only 11.6 million acre-feet.

B. LEGAL

In November, 1970 there was filed in the United States District Court for the District of Columbia a suit against the Commissioner, Bureau of Reclamation, and the Secretary of the Interior, entitled *Friends of the Earth, et al.* v. *Secretary of the Interior, et al.* (Civil No. 3273-70). Basically, the Plaintiffs are seeking to secure an order of the court to require the Defendants to operate Lake Powell so that the waters of the lake would not enter Rainbow Bridge National Monument. The Defendants filed a motion raising a number of issues, one of which was that the case should be transferred to the United States District Court for the State of Utah. This motion was granted and the case was transferred and became Civil No. C 116-71 in the United States District Court for Utah. A number of parties sought permission to intervene in this case. These petitioners were State of Colorado, State of Utah, Colorado River Water Conservation District, Southwestern Water Conservation District, Intermountain Consumer Power Association, Northern Division Power Association, Inc., and Central Utah Water Conservancy District. At the close of the water year the case had not been tried by the United States District Court.

The legal staff of the Commission was occupied through the year with this case. Numerous memoranda were prepared dealing with the many facets of the lawsuit. A number of conferences required participation. The importance of this lawsuit has never been minimized by the Commission staff. The full facilities of the staff have always been made available to work on it.

Interspersed with participation in the Rainbow case has been the usual activities of the legal staff. The newsletter and library maintenance has continued. In December, 1970, the General Counsel attended a conference on Environmental Law in San Francisco, California.

The legal staff completed its assignment with the Type I Comprehensive Framework Study for the Upper Colorado Region. The final publication of Appendix No. III on Legal and Institutional Environments was completed and the appendix circulated.

The second volume of *Selected Legal References* was issued during the year. This volume consolidated the individual supplements which had been separately issued and also included new material through the First Session of the 92d Congress.

During the past year a number of memoranda were prepared on various legal problems that fell within the scope of the Upper

U. S. Bureau of Reclamation Photo

Rainbow Bridge with Lake Powell in the channel of Bridge Creek. The water has entered Rainbow Bridge National Monument, the boundary of which is approximately at the small footbridge near the center of the picture.

Colorado River Commission's activities. There has also been a continuing program of acquisition of historical and current information that sheds light on the growing body of law known as the "law of the river," and in which members of the Commission and their legal advisers have a primary interest. This material has been added to the Commission's library for future reference by the member States.

C. EDUCATION — INFORMATION

General Cooperation

The Upper Colorado River Commission has directed its Education and Information program toward promoting interstate cooperation, harmony and united efforts; developing an understanding in other sections of the United States of the problems of the Upper Colorado River Basin; and the creation of a favorable attitude on the part of the Congress with respect to the development of the industrial and agricultural resources of the Upper Colorado River Basin.

During the past year much effort was directed toward informing representatives of all forms of news media of the facts relative to the Rainbow Bridge litigation. A number of trips were made to Lake Powell and Rainbow Bridge National Monument as part of this program. Numerous appearances were made before interested water and land resources and civic organizations to disseminate information to counteract the propaganda spread by opponents of the Colorado River Storage Project.

A colored brochure entitled "*Rainbow Bridge and Lake Powell—A Study in Values*" was also given wide distribution throughout the United States.

The Commision has continued to cooperate with members of the Congressional Delegations from the Upper Colorado River Basin States and with officials of the Department of the Interior and the Bureau of Reclamation in seeking appropriations of funds by the Congress for the construction of the Storage Units and participating projects authorized for construction, as well as funds for the investigations of additional participating projects that are given priority in planning in the Colorado River Storage Project Act. As part of this cooperation the Commission's Executive Director has been in Washington, D.C. at intermittent periods acting as liaison between the Congress and States and various departments of government, supplying information, arranging and taking part in Congressional hearings, and providing other assistance requested.

Relief Model

The Relief Model of the Upper Colorado River Basin and adjacent areas is available for display at conventions and other public events and has proved to be extremely interesting and instructive in promoting an understanding of the physical and hydrologic problems of the Upper Colorado River Basin and the development of its water and other natural resources. (See last page of this report.)

Motion Pictures

The motion pictures in the Commission's film library continue to be widely distributed. In addition to filling requests for the picture entitled "The Lakes Made For You" showing the recreational benefits of man-made reservoirs, hundreds of requests have also been filled for motion pictures about Glen Canyon and Flaming Gorge reservoirs and other river basin subjects by utilizing films that have been supplied to the Commission by the Bureau of Reclamation, et al. Widespread interest has been created in recent years by schools, colleges, civic clubs, etc., in the benefits of river basin development. Undoubtedly some of this increased interest can be traced to the fact that since the completion of Flaming Gorge, Glen Canyon, Blue Mesa, and Navajo dams and reservoirs the American public is becoming more aware of the national benefits of man-made bodies of water in the Colorado River Basin and elsewhere.

Library

Efforts are being continued to accumulate all types of engineering, legal, economics, and semi-technical documents related to the Colorado River Basin to comprise a well-equipped and efficiently operating permanent library. Many thousands of pages of documents have been placed on microfilm. Information in the Commission's library will be available to any of its member States on short notice should a need arise. Studies are being made and supplemented of many problems associated with the development, utilization, and conservation of water and hydro-electric resources of the Colorado River Basin.

IX. Legislation

The 1971 water year which terminated September 30, 1971 was a year for hearings before Congressional committees in the field of water and related resources development. The primary emphasis was placed upon the preparation of legislation in the field of Water Pollution Control. Extensive and intensive hearings were held before committees from both Houses of Congress. The final form of this legislation was still in evolution at the end of the 1971 water year.

There was a second field which was entertained by Congressional Committees, namely, the development of a National Land Use Policy. This particular area may in the long run prove to be of great significance for western United States in the fields of resources development. The formulation of this legislation seems still to be in progress.

Congress passed Public Law 92-60 (85 Stat. 159), Saline Water Conversion Act of 1971. The purpose of this Act is to expand and extend the desalting program which the Secretary of the Interior has been conducting. For our water short area this program could prove beneficial.

UPPER COLORADO RIVER BASIN

COLORADO RIVER STORAGE PROJECT

UPPER COLORADO RIVER COMMISSION

X. Colorado River Storage Project and Participating Projects

A. APPROPRIATION OF FUNDS BY THE UNITED STATES CONGRESS FISCAL YEAR 1972

On January 25, 1971 President Nixon in the annual budget message to the Congress recommended a construction program for fiscal year 1972 of $31,854,000 for the Colorado River Storage Project and participating projects. Of this total, $21,909,000 were recommended to finance activities of the Bureau of Reclamation, $435,000 the National Park Service, $510,000 the Bureau of Sport Fisheries and Wildlife, and $9,000,000 for the Bureau of Indian Affairs to be used for construction of the Navajo Indian Irrigation Project. Due to anticipated delays and construction revenues available, the program was recommended to be underfinanced by $1,700,000. Due to the releasing of funds appropriated by the Congress in the previous year and impounded by the Office of Management and Budget, new monies requested to be appropriated amounted to $28,256,000, with $18,651,000 to the Upper Colorado River Basin Fund, $435,000 to the National Park Service, $170,000 to the Bureau of Sport Fisheries and Wildlife, and $9,000,000 to the Bureau of Indian Affairs.

The President's budget also contained an item of $9,501,000 for Operation and Maintenance of the Colorado River Storage Project. The Colorado River Storage Project Act provides in Section 5 (c) that all revenues collected in connection with the operation of the Storage Project and participating projects shall be credited to the Upper Colorado River Basin Fund and shall be available without further appropriation for defraying the costs of operation, maintenance, replacement, and emergency expenditures for all facilities of the Storage Project and participating projects. Operation and maintenance costs allocated to Flood Control and Fish and Wildlife facilities are non-reimbursable in accordance with Section 6 of the Colorado River Storage Project Act, and are to be financed by appropriated funds.

The fiscal year 1972 Operation and Maintenance program for the Colorado River Storage Project provided for operation and maintenance activities on Flaming Gorge, Glen Canyon, Navajo, and Curecanti Storage Units; the transmission lines, and the Florida, Paonia, and Seedskadee participating projects. The program also

provided for the continued purchase of power to cover requirements caused by diminutions in energy generation and capacity impairment created at Hoover Dam powerplants as the result of operations of dams and reservoirs of the Colorado River Storage Project, and provided for quality of water, consumptive use, and flood control studies.

The total fiscal year 1972 O & M program was entirely funded by revenues received from the sales of electric energy and water.

The Upper Colorado River Commission on April 22, 1971 submitted testimony to the Subcommittee on the Department of the Interior and Related Agencies of the Committee on Appropriations of the House of Representatives in support of construction funds for the Navajo Indian Irrigation Project. Similar testimony was also presented to the Senate Committee on Appropriations.

Witnesses representing the Upper Colorado River Commission and various entities in its member States on May 19, 1971 presented testimony to the Subcommittees on Public Works of the House and Senate Committees on Appropriations in support of funds to continue investigations, planning, and construction of the Colorado River Storage Project and participating projects.

On July 29, 1971 the House of Representatives passed H.R. 10090, its Public Works Appropriation Bill for fiscal year 1972. The House in this Bill approved the appropriation of $20,589,000, or $1,333,000 more than was in the President's budget.

On July 31, 1971 the Senate passed its version of the same Bill with an increase to $21,219,000, or $1,963,000 more than the President had requested.

The Conference Committee's Report (House Report No. 92-479) was approved by both houses of the Congress on September 22, 1971 with an appropriation of funds amounting to $21,089,000.

The Public Works Appropriations Act for 1972 again contained language with reference to the protection of Rainbow Bridge National Monument, as follows:

> *"Provided, that no part of the funds herein approved shall be available for construction or operation of facilities to prevent waters of Lake Powell from entering any national monument."*

Table X (a) illustrates a general recapitulation of action by the First Session of the 92d Congress with regard to appropriations of funds for the construction program of the Colorado River Storage Project and participating projects.

TABLE X (a)

COLORADO RIVER STORAGE PROJECT

Fiscal Year 1972 Appropriations

Project and State	President's Budget Jan. 25, 1971	H. R. 10090 Passed House July 29, 1971	H. R. 10090 Passed Senate July 31, 1971	Budgetary Reserve	Total Program Recommended by Senate	Conference Rpt. approved by House & Senate Sept. 22, 1971
Colorado River Storage Project:						
Curecanti Unit, Colorado	$ 6,463,000	$ 3,963,000[1]	$ 3,963,000	$ 150,000	$ 4,113,000	$ 3,963,000
Transmission Division, Various States	3,000,000	3,000,000	3,000,000	—	3,000,000	3,000,000
Participating Projects:						
Central Utah, Bonneville Unit, Utah	8,199,000	10,222,000	10,222,000	2,023,000	12,245,000	10,222,000
Central Utah, Jensen Unit, Utah	200,000	200,000	200,000	—	200,000	200,000
Lyman, Wyoming-Utah	50,000	550,000	550,000[2]	—	550,000	550,000
San Juan-Chama, Colorado-New Mexico	369,000	1,069,000	1,069,000	475,000	1,544,000	1,069,000
Drainage and Minor Construction, Various States	2,070,000	2,270,000	2,900,000	30,000	2,930,000	2,770,000
Advance Planning, Various States	—	410,000	410,000	715,000	1,125,000	410,000[3]
Initial Underfinancing, and Undistributed Reduction Based on Anticipated Delays	—1,700,000	—1,700,000	—1,700,000	—	—1,700,000	—1,700,000
Subtotal—Section 5	$18,651,000	$19,984,000	$20,614,000	$ 3,393,000	$24,007,000	$20,484,000
Recreation, Fish and Wildlife Facilities:						
National Park Service, Various States	435,000	435,000	435,000	—	435,000	435,000
Bureau of Sport Fisheries and Wildlife, Various States	170,000	170,000	170,000	340,000	510,000	170,000
Subtotal—Section 8	$ 605,000	$ 605,000	$ 605,000	$ 340,000	$ 945,000	$ 605,000
TOTAL—Upper Colorado River Storage Project	$19,256,000	$20,589,000	$21,219,000	$ 3,733,000	$24,952,000	$21,089,000

[1]Since the President's Budget Request the Bureau of Reclamation has revised its plans as the result of bidding experience on the Crystal Dam and Powerplant and is proceeding to redesign the Dam. The resulting delay caused the House Committee to reduce the sum approved for the Curecanti Unit by $2,500,000.

[2]Includes $500,000 on Budget Amendment, H. Doc. 92-128.

[3]The $410,000 for Advance Planning includes: Dallas Creek Project $150,000, Dolores Project $160,000, San Miguel Project $100,000.

Note 1: Another related construction item: Fryingpan-Arkansas Project, Colorado $20,247,000.

Note 2: In addition to the sums listed above, the First Session of the 92d Congress, through its Subcommittee on the Department of the Interior and Related Agencies enacted legislation appropriating $9,000,000 to the Bureau of Indian Affairs for construction on Navajo Indian Irrigation Project, New Mexico.

B. FISCAL DATA — COLORADO RIVER STORAGE PROJECT

According to the annual reports of the Secretary of the Interior on the Colorado River Storage Project and participating projects, Congress has appropriated about $868.8 million chargeable against the limitations specified in five pertinent authorization Acts. Table X (b) illustrates the status of appropriations in this category through fiscal year 1972, figured as of October 10, 1971.

Table X (c) shows the total estimated appropriations required through the Upper Colorado River Basin Fund.

Table X (d) illustrates the fact that the total authorized appropriation ceiling of $760,000,000 under P.L. 485, the Colorado River Storage Project Act of 1956, due to future appropriations required, will be exceeded by about $607.6 million.

Legislation will be introduced in the Second Session of the 92d Congress to increase the authorized spending ceiling for the Colorado River Storage Project and participating projects by $610 million.

construction on Navajo Indian Irrigation Project, New Mexico.

TABLE X (b)

Appropriations to Date
Chargeable Against Authorizing Act Limitations

October 10, 1971

F.Y.	*Amount*
1957	$ 13,000,000
1958	35,142,000
1959	68,033,335
1960	74,459,775
1961	58,700,000
1962	55,468,000
1963	111,808,000
1964	97,989,200
1965	60,300,000
1966	49,811,500
1967	50,448,000
1968	42,350,000
1969	29,873,000
1970	28,240,000
1971	25,375,000
1972	21,088,982
Total	$822,086,792

Plus:

Navajo Indian Irrigation Project Appropriations to date	46,685,500
Total Appropriations to date	$868,772,292

TABLE X (c)

Colorado River Storage Project and Participating Projects
Total Appropriation Requirements

October 10, 1971

Total estimated appropriations required per Upper Colorado River Basin Fund		$1,731,500,656
Plus:		
Estimated Section 8 (P.L. 84-485) Appropriation Requirements (see details below)	$93,147,352	
Appropriations for Operation and and Maintenance	3,577,680	
Transfers to GSA for Space Cost Rental	228,625	
Region 5—San Juan-Chama Project	85,158,000	
Region 5—Navajo Indian Irrigation Project	206,000,000	
Region 7—Transmission Division	64,496,000	
Other Advance Planning Obligations:		
LaBarge Project	136,279	
Pine River Extension	136,496	
Quality of Water	498,926	
		453,379,358
Less:		
Uintah Unit Estimated Appropriations not included in Limitation Figures	41,517,000	
Paonia Reclamation Fund Appropriations	2,046,067	
		43,563,067
Total Estimated Appropriation Requirements		$2,141,316,947

Section 8 Appropriation Requirements
from fiscal year 1973 Budget Estimates

Bureau of Sport Fisheries and Wildlife	$28,018,902
National Park Service	56,682,000
Bureau of Indian Affairs	8,446,450
Total	$93,147,352

TABLE X (d)

BUREAU OF RECLAMATION
STATUS OF APPROPRIATION CEILINGS
COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

	Act of 4/11/56 (P.L. 485)	Act of 6/13/62 (P.L. 87-483) San Juan-Chama	Act of 6/13/62 (P.L. 87-483) Navajo	Act of 9/2/64 (P.L. 88-568)	Act of 9/30/68 (P.L. 90-537)	Total
Intial Authorization (4 Storage Units and 11 Projects)	$ 760,000,000	—	—	—	—	$ 760,000,000
San Juan-Chama	—	$85,828,000[1]	—	—	—	85,828,000
Navajo Indian Irrigation Project	—	—	$135,000,000[1]			
Bostwick Park, Fruitland Mesa, Savery-Pot Hook Projects	—	—	—	$47,000,000[1]	—	135,000,000 47,000,000
Animas-LaPlata, Dallas Creek, Dolores, San Miguel, and West Divide	—	—	—	—	$392,000,000[1]	392,000,000
Total Ceilings	760,000,000	85,828,000	135,000,000	47,000	392,000,000	1,419,828,000
Less: Appropriations to 10-15-70[2]	748,072,114	62,739,350	46,685,500	10,161,675	1,113,653	868,772,292
Balance of Limitation	11,927,886	23,088,650	88,314,500	36,838,325	390,886,347	551,055,708
Estimated Total Appropriations Required	$1,367,609,320	$86,647,200	$206,039,115	$93,852,012	$387,169,300	$2,141,316,947
Requirements in Excess of Limitation	607,609,302	819,200	71,039,115[1]	46,852,012[1]	—	—

Appropriations to 10-10-71 includes Section 8 Funds and Transfers to GSA for space cost financing.

[1]Authorization Act allows construction costs indexing, which is not reflected in limitation figures.

[2]Fiscal Year 1972 appropriations included through 10/10/71.

C. AUTHORIZED STORAGE UNITS

(Information relative to Storage Units and Participating projects has been obtained from reports on investigations and activities of the United States Department of the Interior, Bureau of Reclamation.)

The Colorado River Storage Project was authorized for construction by the U.S. Congress in the act of April 11, 1956 (70 Stat. 105). The four storage units are comprised of Glen Canyon Dam and Lake Powell on the Colorado River in Arizona and Utah, Navajo Dam and Reservoir on the San Juan River in New Mexico and Colorado, Flaming Gorge Dam and Reservoir on the Green River in Utah and Wyoming, and the Curecanti Storage Unit on the Gunnison River in Colorado. The Curecanti Unit consists of three dams and reservoirs—Blue Mesa, Morrow Point, and Crystal. Combined, the four storage units will provide about 33,583,000 acre-feet of water storage capacity.

The authorizing act also provided for the construction of 11 participating irrigation projects. Ten additional participating projects were added by subsequent legislation.

1. Glen Canyon Storage Unit

Glen Canyon Dam and Reservoir comprises the key storage unit. It is the largest of the initial four, providing about 80 percent of both the storage and generating capacity. The 710-foot high concrete arch dam is located in northern Arizona on the Colorado River, 12.4 miles downstream from the Utah-Arizona State line and 15.3 miles upstream from Lees Ferry. (*Lees Ferry is the location of the Geological Survey gaging station and is 1 mile upstream from the compact point, Lee Ferry, which divides the Colorado River drainage into two basins.)* Glen Canyon Dam is the second tallest dam in the United States. The reservoir has a capacity of 27 million acre-feet and will extend a maximum of 186 miles upstream on the Colorado River and 71 miles up the San Juan River. The powerhouse, located at the toe of the dam, has eight generating units with a total installed capacity of 950,000 kilowatts.

Glen Canyon Dam was completed in 1964.

Construction

Construction during 1971 was limited to improving operations, maintenance, appearance, and safety at the dam, powerplant, and the Government-operated community of Page, Arizona. Installation was completed in the spring of 1971 on a hydraulic service elevator

to aid in moving materials and heavy equipment between work levels in the powerplant area. Painting Page City water storage towers was finished early in 1971.

Recreation

Visitation to the Glen Canyon National Recreation Area showed a small decrease during 1971 when 873,090 visits were recorded.

The National Park Service has concession-operated facilities at Wahweap, Rainbow Bridge, Halls Crossing, Hite, Lees Ferry, and Bullfrog Basin.

From 1909 through 1961 a total of 20,972 vacationers visited Rainbow Bridge. When access to the Bridge was made available by water through closure of the dam in 1963, interest in the area rapidly increased. In 1966 there were 20,468 visitors, or almost as many as the total of 20,972 who enjoyed the Rainbow during all the 53 years prior to the construction of the dam. During 1971 there were 41,818 visits recorded — twice as many people as viewed Rainbow Bridge from 1909 through 1961.

At Glen Canyon Dam the Carl Hayden Visitor Center entertained 237,632 people during 1971, and 150,025 persons toured through the dam.

A total of 18 million fish — including largemouth bass, rainbow trout, Kamloop trout, kokanee salmon, and black crappie — have been planted in the lake.

2. Flaming Gorge Storage Unit

Flaming Gorge Dam is located on the Green River in northeastern Utah, about 40 road miles north of Vernal, Utah, and 32 river miles downstream from the Utah-Wyoming State line. The dam is a concrete thin-arch structure rising 502 feet above bedrock. The reservoir has a capacity of 3,789,000 acre-feet and, when full, extends upstream 91 miles, or nearly to the town of Green River, Wyoming. The powerplant has an installed generating capacity of 108,000 kilowatts. The dam and powerplant were completed in 1963.

Construction

A freight elevator was installed in the powerhouse early in the year. This facility will assist in moving maintenance materials and heavy equipment between work levels. The powerplant service yard, service road, and the visitor center parking area were given a new

2-inch plant-mix bituminous surface coat. The streets of Dutch John were cleaned, damaged areas were repaired, and an asphalt seal coat and stone chip surface applied. Late in the summer a painting contract was awarded, and the exteriors of 46 residences and buildings in Dutch John were painted.

Recreation

In 1971 there were 674,926 recreation days recorded at the Flaming Gorge National Recreation Area. One of the largest single attractions in the Flaming Gorge National Recreation Area has been the self-guided tour provided by the Bureau of Reclamation through the Flaming Gorge Dam and Powerplant. During 1971, 67,100 enthusiastic visitors enjoyed the tour.

Fishing is an important sporting activity at Flaming Gorge Reservoir and in the Green River below the dam. During 1970, about 282,400 trout were taken from the reservoir and 43,400 from the tailwaters downstream.

The U.S. Forest Service administers recreation facilities at Lucerne Valley, Antelope Flat, Buckboard Crossing, Squaw Hollow, Firehole Canyon, Dutch John Draw, Cedar Springs, and Sheep Creek. Each site has boat ramps, picnic, and campground areas. Concession facilities are available at Lucerne Valley, Buckboard, and at Cedar Springs. In addition, several campground and overlook areas have been developed near the reservoir in the Ashley Forest.

3. Navajo Storage Unit

The 402-foot-high Navajo Dam and reservoir was the first storage unit of the Colorado River Storage Project to impound water.

Navajo Dam is located in northwesten New Mexico on the San Juan River, 34 miles east of Farmington and 3½ miles downstream from the confluence of the Los Pinos and San Juan Rivers. The dam is a zoned, earth-fill, embankment structure. The reservoir has 1,709,000 acre-feet total capacity and an active capacity of 1,036,000 acre-feet.

The major purpose of this reservoir is to regulate the flows of the San Juan River for the authorized Navajo Indian Irrigation Project near Farmington, the San Juan-Chama participating project in the Rio Grande Basin, and the Hammond participating project. Part of the water to be made available will also be used for industrial and municipal purposes in northwestern New Mexico.

Construction

Construction during 1971 was limited to improving operation, maintenance, appearance, and safety at the dam. A heated, insulated, prefabricated metal shelter was erected over the fixed-wheel gate hoist and control cabinet at the crest of the dam. On the left abutment a segment of the dam access road was stabilized by installation of a surface water drainage pipe across the roadway, a perforated corrugated metal drain pipe, and erection of a metal bin retaining wall.

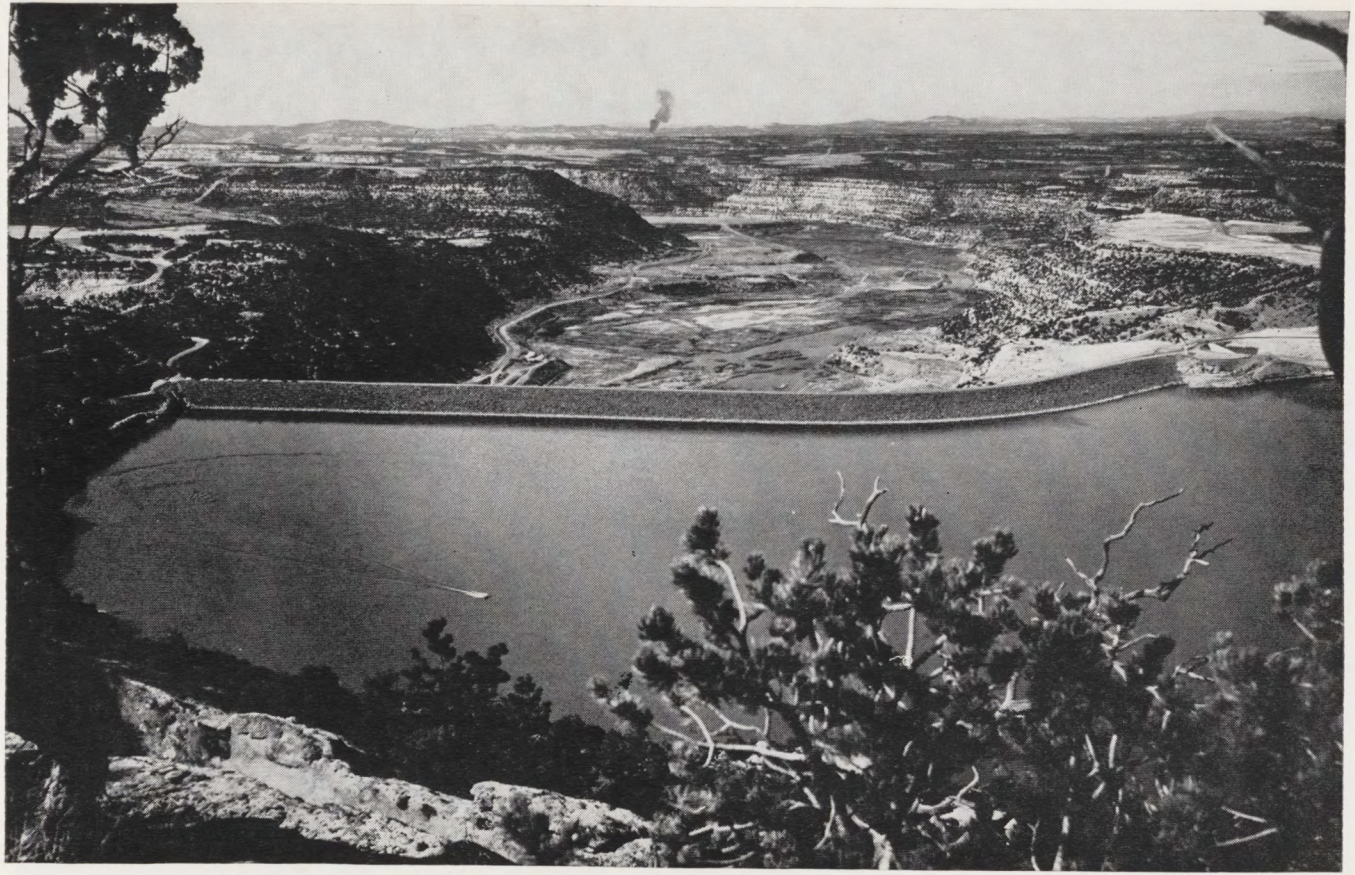
Recreation

Navajo Reservoir attracts visitors from many points — 596,800 during 1970. Recreational areas have been developed in New Mexico on the Pine River Arm above Navajo Dam and on Sims Mesa on the opposite shore, and near Arboles, Colorado on the upper portion of the lake. There are basic recreation facilities at the three sites. They include concrete boat ramps, visitor centers or administration buildings, picnic areas and campgrounds, modern restrooms, parking facilities, culinary water, sewer systems, and employee residences. In addition, concessionaires at Pine River and at Arboles have developed marina facilities and services, including food and trailer park accommodations. They are preparing plans for lodges, restaurants, etc. Plans have been prepared by an Interagency Task Force for development, beginning in 1973, of recreation sites along the San Juan River below Navajo Dam. These sites include picnicking, camping, sanitary, and related facilities for fishermen and hunters. Fishing in the San Juan River downstream from Navajo Dam has become outstanding. In 1970 about 150,000 fisherman-hours were spent there and 86,200 trout were caught. Navajo Reservoir is also a popular fishery. During the 1970 season, 320,000 fish were taken from the reservoir.

4. Curecanti Storage Unit

Curecanti Storage Unit includes three major dams and powerplants along a 40-mile canyon of the Gunnison River below Gunnison, Colorado, and upstream from the Black Canyon of the Gunnison National Monument.

Flows of the Gunnison River are now controlled by the 940,800-acre-foot Blue Mesa Reservoir, the largest and uppermost of the reservoirs. Water released from the Blue Mesa Reservoir through a 60,000-kilowatt-capacity powerplant receives short-term regulation at the Morrow Point Reservoir immediately downstream. Morrow Point Reservoir has a total capacity of 117,190 acre-feet, and an



U. S. Bureau of Reclamation Photo

Navajo Dam and Reservoir, New Mexico, looking downstream. The main canal headworks for the Navajo Irrigation Project are on the left adjacent to the Dam.

active capacity for power production of more than 42,000 acre-feet. The Morrow Point powerplant has a generating capacity of 120,000 kilowatts, of which only 60,000 kilowatts can be utilized until Crystal Dam becomes operable to reregulate river flows. Crystal Powerplant will have a generating capacity of 28,000 kilowatts.

Construction

Blue Mesa Dam and Powerplant have been operating since April 1, 1968. The two 30,000-kilowatt generating units produce electrical energy for the Colorado River Storage Project power system. Work is almost completed on a new 115-kv bay at Morrow Point switchyard for interconnection with Colorado-Ute Electric Association transmission system.

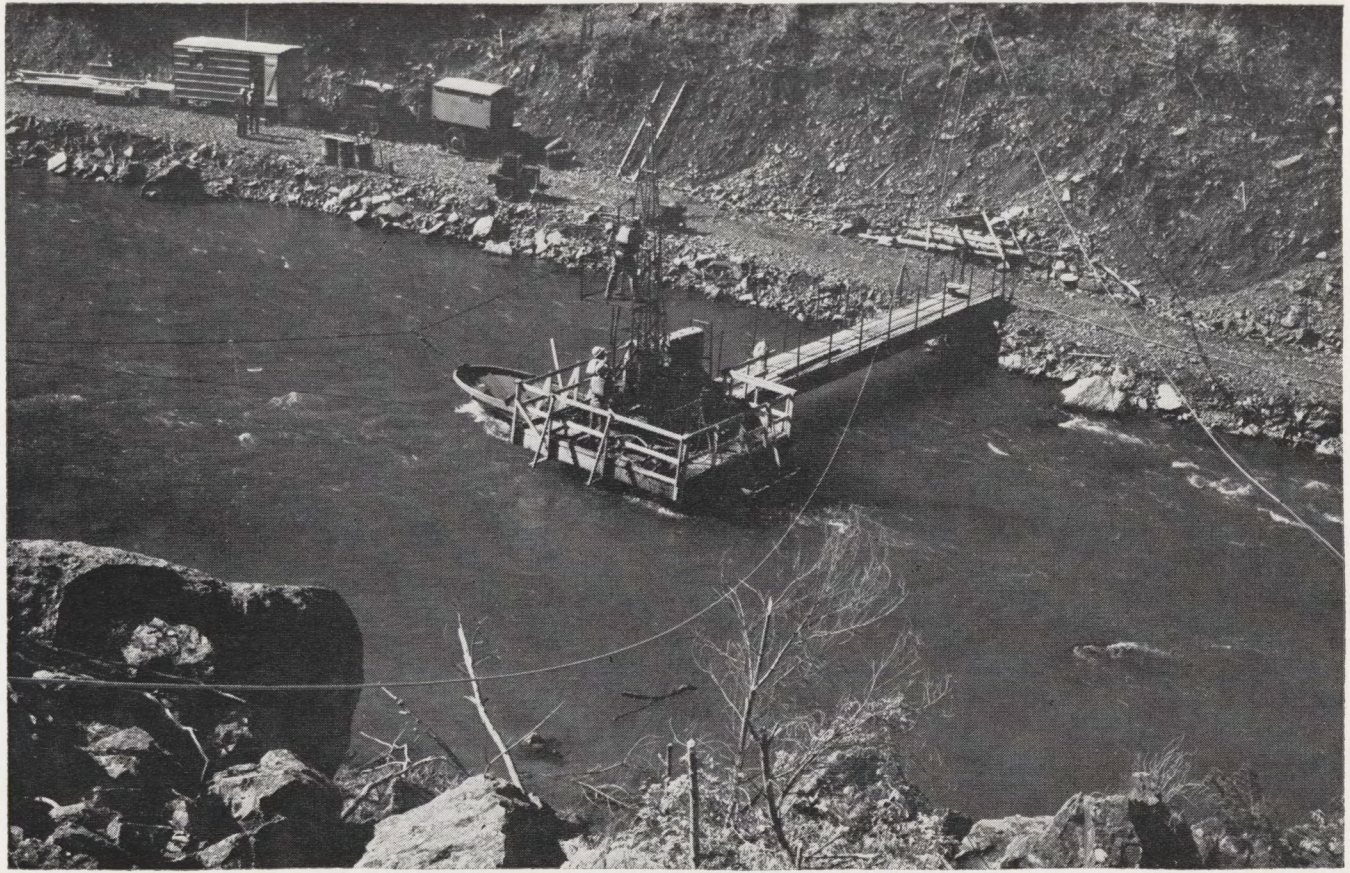
At Morrow Point work has been completed on the powerplant and switchyard which were transferred to operation and maintenance status on September 1, 1971.

Work has been almost completed on Crystal Field Station, office, laboratory, and garages. Sophisticated consideration of the environment and a possible lower cost factor have led to a change in plans for Crystal Dam. Work is progressing rapidly on design of this facility as a double-curvature, thin arch, concrete dam rather than the earthen dam originally planned. Bids will be taken late in 1971 for excavating a 12-foot diameter horseshoe-shaped 976-foot-long diversion tunnel and four foundation tunnels for Crystal Dam. The construction contract is expected to be awarded early in January 1972, at termination of the required 30-day filing period with the Council on Environmental Quality.

In order to effectively operate Blue Mesa Dam and Reservoir and to meet present and future requirements of the Fish and Wildlife program, it will be necessary to acquire additional properties adjacent to the Gunnison River and immediately above the Blue Mesa Dam and Reservoir. The fee lands purchased will be administered by the Park Service in connection with its recreational development of the reservoir area. During recent years this area has been affected by flooding caused by ice flows in the river channel.

Recreation

The National Park Service has recreation facilities at Elk Creek adjacent to U.S. 50 on Blue Mesa Lake, at the Iola site across the lake, and at the Lake Fork site near the dam. Boat ramps, parking areas, picnic and camping facilities are available at these sites. A visitor center has been opened at Elk Creek.



U. S. Bureau of Reclamation Photo

Exploratory work at the Crystal Dam site on the Gunnison River, Colorado.

The recreation facilities were used on 750,376 visitor days during the 1971 season. This represents an increase of 33.5 percent over the same period in 1970.

A joint Bureau of Reclamation-National Park Service Visitor Center at Cimarron, Colorado — gateway to Morrow Point Dam and to Crystal Reservoir and a major information center for the Curecanti Unit — is planned for construction beginning in 1974.

D. TRANSMISSION DIVISION

The Transmission Division provides facilities for the delivery of Colorado River Storage Project power to major load centers or to delivery points from which other agencies may transmit the power to load centers and to interconnect the generating plants of the Colorado River Storage Project with each other and with adjacent Federal, public, and private utility transmission systems.

Construction

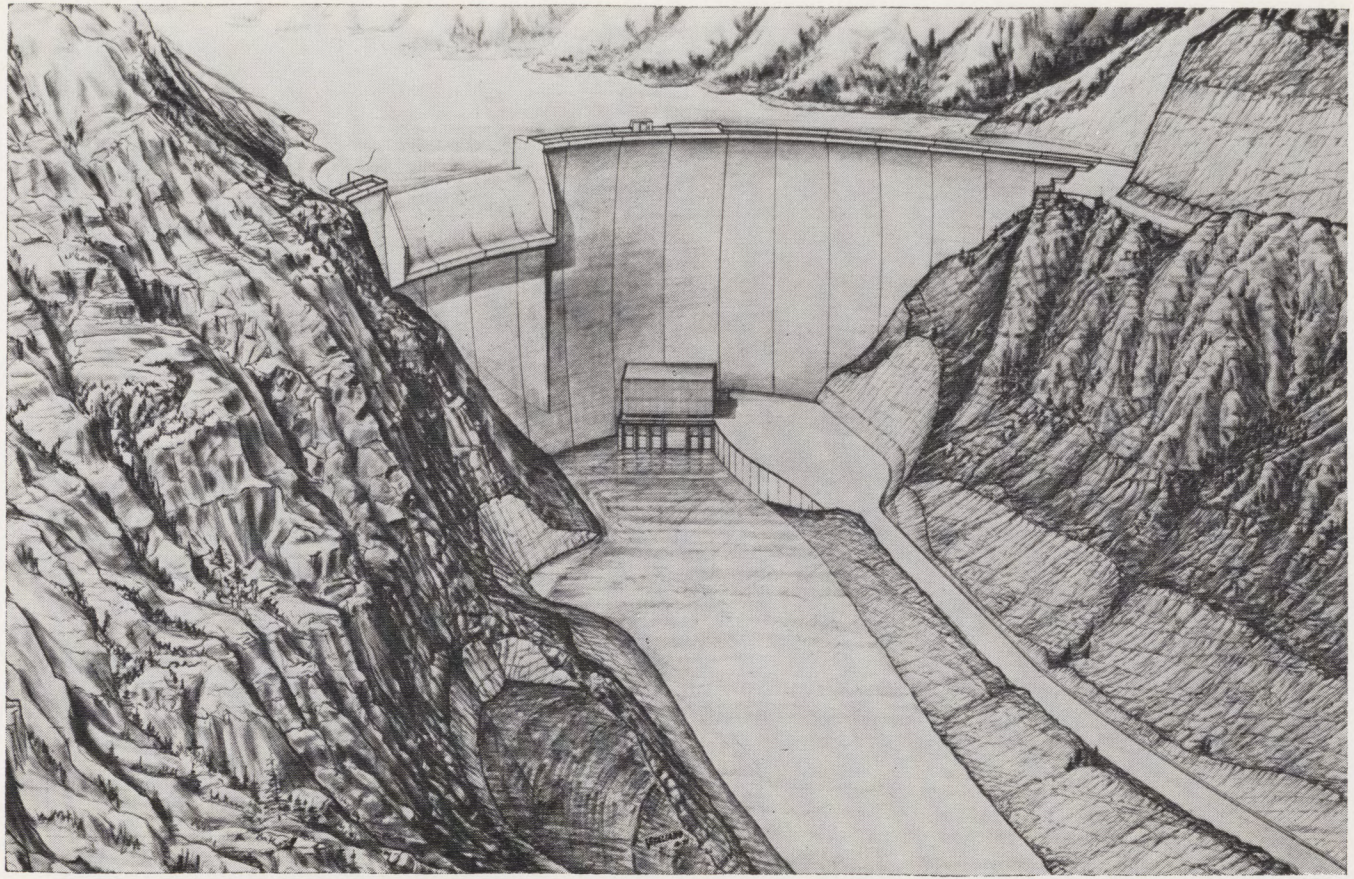
Construction of the Colorado River Storage Project backbone transmission system with its associated communication and control facilities is almost completed. Construction and improvement work was finished early in the year on access roads along the Vernal-Hayden and Artesia-Rangely 138-kv transmission line.

On October 15, 1970 a contract was awarded for Stage 02 and 03 additions to the Archer Substation. The contract provides for the furnishing and installing of two 230 kv oil circuit breakers and one switch, modification of three switches, construction of foundation and installation of cables, meters and other equipment. The scheduled completion date is June 1972. In June 1971 a contract was awarded for constructing operating roads and seeding on the Walden-Archer section of Hayden-Archer Transmission Line. This work was completed in August 1971.

Power Marketing

Generation of electric energy at Colorado River Storage Project powerplants amounted to 4.8 billion kilowatt-hours during the 1971 water year, an increase over the previous year of about 11 percent. The major portion, 3.6 billion kilowatt-hours, was produced at Glen Canyon powerplant with the balance produced at Flaming Gorge, Blue Mesa, Morrow Point, and Fontenelle Dams.

Storage Project power has been fully under contract in the summer seasons. No additional contracts are being executed. Some Storage Project power is being offered to customers on a season-



U. S. Bureau of Reclamation Photo

Artist's conception of Crystal Dam of the Curecanti Storage Unit, Colorado.

by-season basis. It is anticipated that power from Crystal Dam will be available in 1978 and from the Central Utah powerplants in 1981. No commitments will be made for this power until the dates for initial operation are firmly established.

Following the 1972 summer season the Bureau of Reclamation plans to review project loads and resources in order to determine the proper marketing policies to be implemented for the following years.

Revenues from the sale of power amounted to almost $30 million in the past 12 months, an increase of more than 15 percent from the previous year. The average revenue from the sale of one kilowatt-hour was 6.1 mills, up from 6.01 mills. This increase was due to the fact that surplus energy is no longer available for sale.

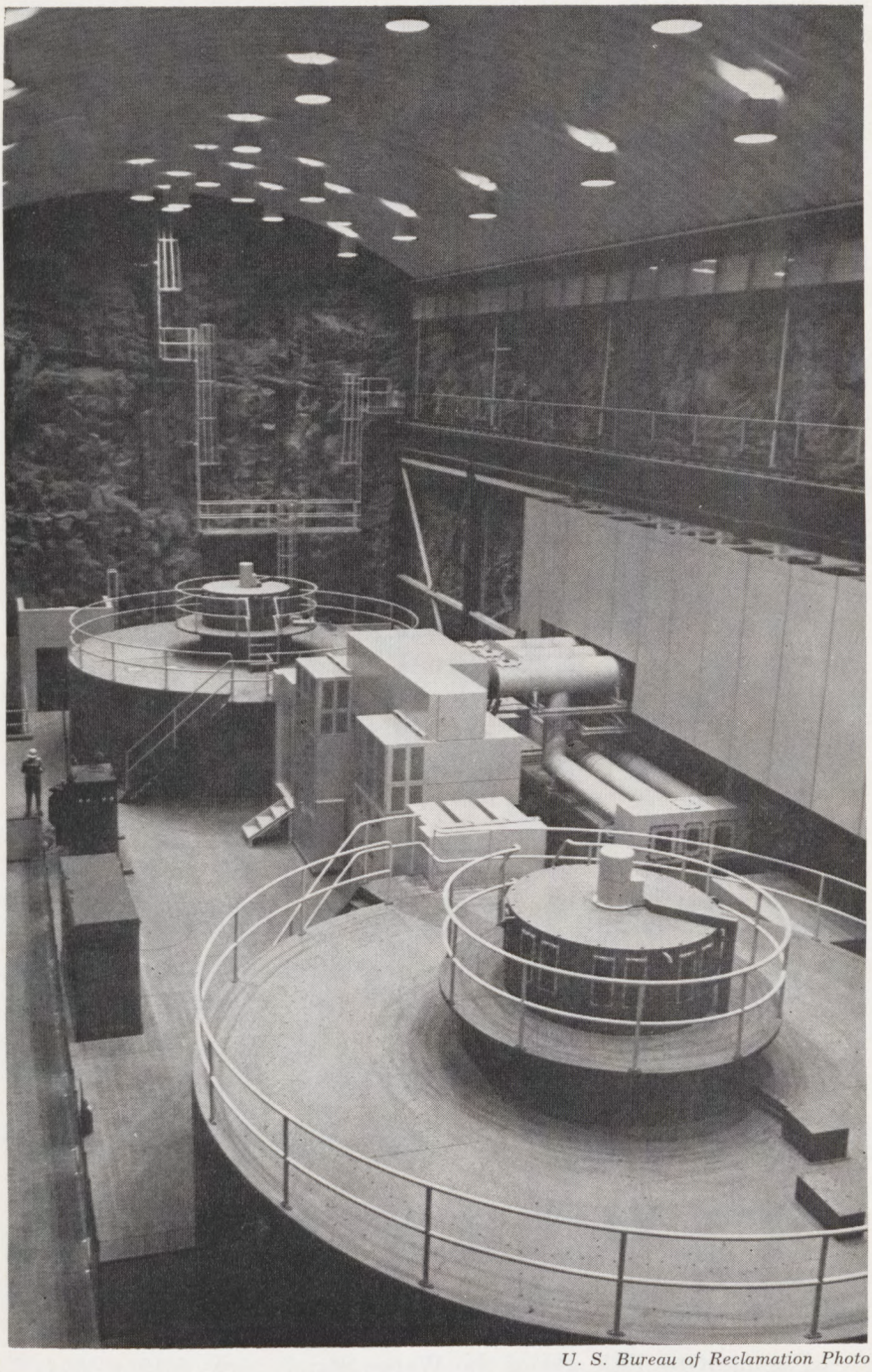
The Bureau of Reclamation is obligated to deliver firm power in 1975-76 as follows:

	1975 Summer (Kw)	*1975-76 Winter (Kw)*
Arizona	303,385	89,990
Colorado	311,005	326,460
New Mexico	133,920	155,725
Nebraska	1,200	1,200
Utah	304,880	325,420
Wyoming	134,425	103,725
California	25,005	—
Nevada	10,848	6,612
Total	1,224,668	1,009,132

Project Repayment

Power operating revenues in fiscal year 1971 paid all power operating and interest costs for that year and repaid $8.4 million of the principal on costs allocated to construction of power facilities for a cumulative total payment of $13.3 million to the end of the fiscal year. The present repayment schedule shows that the interest-bearing investment in power features will be repaid by the end of fiscal year 2008. By fiscal year 2011 all power, irrigation, and municipal and industrial allocations of the Colorado River Storage Project and the power allocations of the Seedskadee participating project and the Central Utah Project (Initial Phase) will be entirely repaid.

Starting in fiscal year 2011 it is expected revenues will be available to Upper Basin States to assist in paying for participating projects. By the year 2059, total revenues for the States are esti-



U. S. Bureau of Reclamation Photo

Two 60,000 KW generators at Morrow Point Powerplant. This powerplant is excavated inside the rock walls of Gunnison River Canyon.

mated to be $1,111,000,000. This compares with $1,331,000,000 estimated in the fiscal year 1970 Fourteenth Annual Report, Colorado River Storage Project of the Secretary of the Interior.

The decrease is primarily due to the following:

1. Not all energy can be sold as firm energy, with the result that a portion of the energy projected as firm may be sold at a lower rate.

2. Higher estimated operation and maintenance costs.

E. SALE OF MUNICIPAL AND INDUSTRIAL WATER

Revenues through June 30, 1971, from contract for water from the four mainstream reservoirs amounted to $286,601. Most of that income represents a "readiness to serve" charge from long term contracts prior to actual use of water.

In October 1969, the Secretary of the Interior executed a contract with Resources Company, Associated Southern Investment Company, and New Albion Resources Company for the sale of 102,000 acre-feet of water from Lake Powell for the proposed Kaiparowits Powerplant in Southern Utah. Also, negotiations were continued with Utah Power & Light Company during the year on a contract for the sale of 6,000 acre-feet of water from Joes Valley Reservoir for a thermal-electric plant in Huntington Canyon, Emery County, Utah.

In January 1969, a water use contract was executed with the Salt River Project Agricultural Improvement and Power District for a diversion of 40,000 acre-feet of water annually from Lake Powell with an annual water depletion limitation of 34,100 acre-feet. This water will be used for the Navajo Powerplant, 4 miles from Page, Arizona. Construction of the plant began in April 1970.

Congress enacted Public Law 90-272, March 22, 1968, approving three long-term water service contracts for use of 64,250 acre-feet of water annually from Navajo Reservoir. Three contracts have been executed, two of which are to provide water for thermal-electric generation uses.

Three short-term water service contracts for water from Navajo Reservoir were executed during 1967. Each will expire in 1972. Under these contracts a total of 1,100 acre-feet of water service is being provided annually.

Pursuant to Title III of the Water Supply Act of 1958, 60,000 acre-feet of capacity in Fontenelle Reservoir were contracted in 1962 to the State of Wyoming for future municipal and industrial

water uses in the State. Wyoming has option contracted with corporations for the water yield from its acquired capacity in Fontenelle Reservoir.

F. SAFEGUARDING THE ENVIRONMENT

The water service contracts, grants of rights-of-way, indentures of lease, and participation agreements that are being negotiated or have been executed between the Secretary of the Interior and various power interests contain specific language providing for water and air pollution control as a safeguard against the possible negative effects of powerplants on the environment. Contract language relating to water pollution control provides for limits on, and monitoring of effects of plant effluents on streams within the Federal and State standards. Air pollution control language provides for (a) compliance with Federal and State standards; (b) approval of designs for air pollution control equipment by the Secretary in advance of installation; (c) reports to the Secretary on operation of such equipment at least once annually; and (d) periodic review of technological advances in air pollution control equipment to insure maximum effectiveness.

Efforts to protect the environment are concentrated on the Navajo, San Juan, and Four Corners Powerplants. The United States will own 24.3 percent of the Navajo plant for the purpose of providing pumping power for the Central Arizona Project.

G. AUTHORIZED PARTICIPATING PROJECTS

Twenty-one participating projects have been authorized by Congress. Eleven were authorized by the initial authorizing act of April 11, 1956 (70 Stat. 105); two were authorized by the act of June 13, 1962 (76 Stat. 96); three were authorized by the act of September 2, 1964 (78 Stat. 852); and five by the act of September 30, 1968 (82 Stat. 886). Eleven are in Colorado, three are in New Mexico, two are in Utah, three are located in Wyoming, one in both Colorado and Wyoming, and one in both Colorado and New Mexico. Participating projects consume water of the Upper Colorado River System for irrigation and municipal and industrial purposes and use revenues in the Upper Colorado River Basin Fund to help repay the costs of irrigation features beyond the ability of the water users to repay.

Six participating projects have entered into their respective repayment periods. Revenues representing both interest and principal repayment amounted to $509,808 as of June 30, 1971.

The Pine River Project Extension in Colorado was eliminated as a participating project by the Colorado River Basin Project Act of September 30, 1968. Construction of the La Barge participating project in Wyoming has been indefinitely deferred.

A brief description of each of the authorized participating projects and the present status of its construction or investigations follows:

1. COLORADO

a. Paonia Project

Paonia Dam was completed in January 1962 — the first participating project of the Colorado River Storage Project to be completed. Responsibility for operating and maintaining the dam was transferred to the North Fork Water Conservancy District on June 1, 1962. Recreation facilities have been constructed and are in use.

The project is located near Paonia and Hotchkiss in west-central Colorado on the North Fork of Gunnison River. Water stored in the 21,000-acre-foot capacity Paonia Reservoir is distributed to project lands through the enlarged and extended Fire Mountain Canal. Irrigation water supply is supplemented for 13,070 acres of land previously irrigated and a full water supply provided for 2,320 acres of new land. Flood damages have been reduced and fish and wildlife values enhanced.

b. Smith Fork

Smith Fork Project is located in Delta County, along the Smith Fork of the Gunnison River. The project was completed in the fall of 1962. Principal features include Crawford Dam and Reservoir, Smith Fork Diversion Dam, Smith Fork Feeder Canal, and the Aspen Canal. Crawford Reservoir, capacity of 13,650 acre-feet, was constructed on Iron Creek, a tributary of Smith Fork. The reservoir regulates the flow of Iron Creek and surplus flows of the Smith Fork that are conveyed to it by the Smith Fork Feeder Canal. Small quantities of reservoir storage water are released to Iron Creek and diverted by several small existing ditches. The remainder is released to the new Aspen Canal and conveyed by this canal to existing ditches for distribution. Some of the storage water releases through the Aspen Canal replace present direct flow diversions from Smith Fork, thus permitting additional direct flow diversions to be made higher on the streams through existing ditches.

Smith Fork Project provides a full water supply for irrigating 1,423 acres of new land and a supplemental supply for 8,056 acres of irrigated land located near Crawford, Colorado.

The project was transferred to the Crawford Water Conservancy District for operation and maintenance on January 1, 1964.

Recreation facilities for boating, picnicking, and camping have been developed at Crawford Reservoir, and local use of the reservoir is significant. During the 1971 season 114,400 visits were recorded.

c. Florida Project

The Florida Project is located in southwestern Colorado, southeast of Durango in the Florida River Valley and on Florida Mesa. Its principal features include Lemon Dam on the Florida River with a reservoir capacity of 40,100 acre-feet, enlargement of the existing Florida Farmers Ditch and Florida Canal, Florida Diversion Dam, and construction of the Florida laterals to serve approximately 2,210 additional acres of project lands. Flood control and fish and wildlife values are enhanced. The project includes 5,730 acres of new land and 13,720 acres of presently irrigated land needing a supplemental water supply.

All work contracted by the Bureau of Reclamation on Florida Project has been accomplished. Lemon Dam, key feature of the project, was completed in November 1963. Under provisions of the Drainage and Minor Construction Act of June 13, 1956 (70 Stat. 274), the United States advanced funds to the Florida Water Conservancy District to rehabilitate four existing irrigation systems on the Florida Mesa. All work has been completed.

Lemon Dam and Reservoir were transferred to the Florida Water Conservancy District for operation and maintenance on January 1, 1968. All conveyance and distribution facilities were transferred to the District for operation and maintenance on April 1, 1967.

Recreational use at Lemon Reservoir far exceeds estimates made before the construction of the dam and reservoir. The reservoir area sustained 49,255 visits during the 1971 season. Recreation facilities include a boat ramp, picnic areas, campgrounds, parking, water, and sanitation facilities.

d. Silt Project

The Silt Project is located between Rifle and Elk Creeks near the towns of Silt and Rifle in western Colorado. An improved water supply for 4,628 acres of partially irrigated land and a full supply

for 2,416 acres of new land are provided. Constructed features include Rifle Gap Dam which has created a reservoir of 12,600-acre-foot capacity, the Silt Pumping Plant, headworks and inlet channel, rehabilitation of the abandoned Davie Ditch, and construction of laterals and drains. Rifle Gap Dam is a 1,768,000-cubic yard earth-and-rockfill structure, rising 120 feet above the streambed and 1,575 feet long at the crest. The dam was accepted as complete in June 1967.

Recreation facilities include a boat ramp, picnic areas, campground, parking, water, and sanitary facilities. The area sustained 78,100 visits during the 1971 season.

e. Fryingpan-Arkansas Project

Although the Fryingpan-Arkansas Project is not a full-fledged participating project of the Colorado River Storage Project because it does not participate in the use of Upper Colorado River Basin Fund revenues, it could be called a "limited" participating project in the Upper Basin development plan because it does use water apportioned to the Upper Basin by the Colorado River Compact and to the State of Colorado by the Upper Colorado River Basin Compact. This project was authorized by Public Law 87-590, which was signed by the President August 16, 1962.

On September 30, 1971 the Charles H. Boustead Tunnel was nearing completion. The final concrete placement was made on October 2, 1971. Excavation of Hunter Tunnel was begun on October 10, 1970 and the heading was advanced 10,784 linear feet during the year. The Nast Tunnel heading was advanced 3,922 linear feet and is being excavated with a boring machine. The Nast Tunnel access road was completed in August of 1971. Work of constructing an offiice and laboratory building at Pueblo Dam was completed in March 1971. Progress has been good on the first contract for construction of Pueblo Dam and completion of work should be prior to the scheduled completion date, April 1972. In February 1971 a $1,740,436 contract was awarded for furnishing and installing a pump turbine for the Mt. Elbert pumped-storage powerplant. Several minor contracts were awarded during the year and were near completion at the end of the 1971 Water Year.

f. Fruitland Mesa Project

The Fruitland Mesa Project, located in west-central Colorado, was authorized by Congress in September 1964. The project will provide supplemental water for 7,010 acres of presently inadequately irrigated land and a full supply of irrigation water to 15,870 acres

U. S. Bureau of Reclamation Photo

Aerial view of initial construction for Pueblo Dam of the Fryingpan-Arkansas Project, Colorado.

of land. In addition, recreation and fish and wildlife benefits will be provided. Principal project features will include the Soap Park Dam and Reservoir, the Black Mesa Conduit, the 22-mile Fruitland Canal, and two diversion dams.

Advance Planning

Advance planning studies were initiated in fiscal year 1965. Preconstruction activities have been in progress since completion of the definite plan report in 1967. Collection of design data has been completed, and the design and estimates for Gould Canal structures are being prepared. Right-of-way for Gould Canal structure is being acquired. Additional drilling has been outlined for Soap Park Dam and for Black Mesa Tunnel. The Fruitland Mesa repayment contract was executed June 25, 1969, and was validated by the District Court of Delta County, Colorado, on September 29, 1969. Plans are being developed for settlement of new farm units in the project area. Construction is scheduled to be initiated in fiscal year 1974, if funds become available.

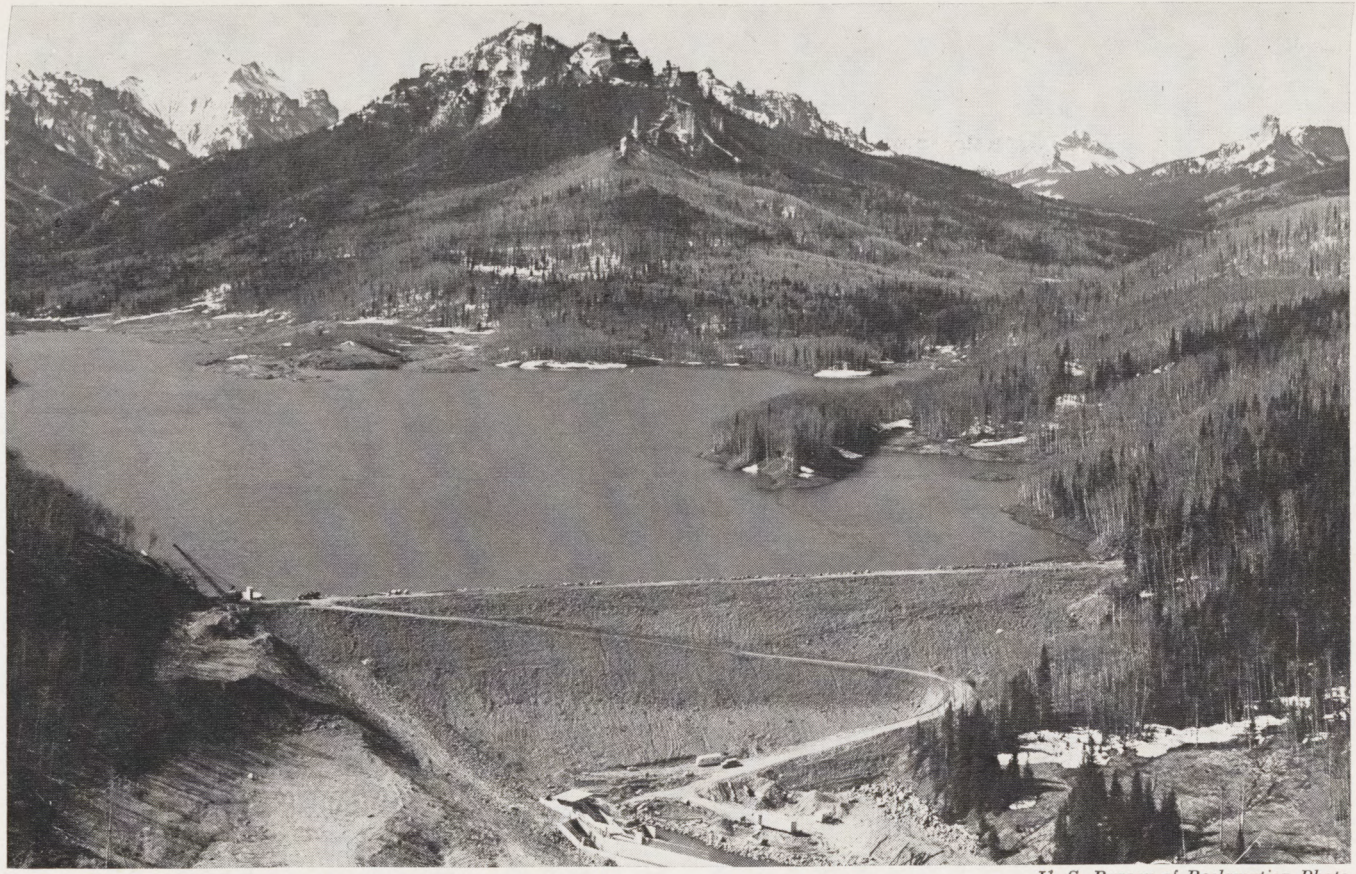
g. Bostwick Park Project

Congress authorized construction of the Bostwick Park Project in September 1964. Located in west-central Colorado, the Bostwick Park Project will provide a supplemental water supply for 4,500 acres of the presently inadequately irrigated land and a full water supply for 1,455 acres of new land. The project will also provide recreation and fish and wildlife benefits. Regulation of flows of Cimarron Creek will be provided by the Silver Jack Dam, principal feature of the project. Released storage water and usable natural flows will be diverted from Cimarron Creek into the existing Cimarron Canal and conveyed 23 miles to the vicinity of the project lands where distribution will be made through existing ditches. Two laterals will be constructed to convey water to lands at higher elevations than those presently irrigated.

Construction Activities

Silver Jack Dam was completed in 1971 and the reservoir filled and spilled for the first time June 10, 1971. Water will be drawn from the reservoir late in 1971 in order for the contractor to complete construction cleanup activities.

New construction during the year included installing a floating trash barrier above the morning-glory-type spillway and a protective fence along the crest of the dam. Initiation of construction on lateral and drainage works is expected to start in 1972.



U. S. Bureau of Reclamation Photo

Silver Jack Dam of the Bostwick Park Project. This dam is located high in the San Juan Mountains of southwestern Colorado.

h. Dallas Creek Project

Advance planning studies were initiated in fiscal year 1971. Advance planning has included site selection for Ridgway Dam and Reservoir, foundation drilling, and plan formulation studies. The Dallas Creek Project will develop water of the Uncompahgre River and tributaries for irrigation and municipal and industrial use. It also will provide benefits to recreation, fish and wildlife, and flood control.

Principal water storage will be provided on the Uncompahgre River by a reservoir of approximately 150,000 acre-feet capacity. Flows of Cow Creek wil be brought to the reservoir by feeder canal.

Studies to determine the most favorable site for the Ridgway Dam indicate an alternate site located about 5 miles downstream from the original site has considerable advantages. The alternate site is more favorable geologically and would have a smaller reservoir area without inundating the town of Ridgway or the beautiful Ridgway Valley, thus affording substantial environmental advantages over the original location.

The smaller Dallas Divide and Sneva Reservoirs will be supplied by feeder canals from Dallas and Cow Creeks, respectively. Part of the water released from the main reservoir on Uncompahgre River will be pumped by hydraulically driven turbines to the lower lands on Log Hill Mesa. The remainder will propel the turbines and then supply existing and project rights downstream. The higher lands on Log Hill Mesa wil be served by gravity releases from the Dallas Divide Reservoir.

The project will provide irrigation water for 23,620 acres, including 14,900 acres that now are not irrigated. It will provide 15,000 acre-feet annually for municipal and industrial use in the Uncompahgre Valley. The municipal water will be distributed by the Tri-County Water Conservation District.

	Ridgway	Dallas Divide	Sneva
Dam type	Earth	Earth	Earth
Dam height (feet above streambed)		165	82
Crest length (feet)		4,420	1,340
Reservoir capacity (acre-feet)	150,000	17,600	825

i. Dolores Project

Advance planning studies were initiated in fiscal year 1971. Land classification studies, preparation of preliminary cost estimates, and plan formulation studies are in progress.

The Dolores Project will develop water of the Dolores River

for irrigation, municipal and industrial use, recreation, fish and wildlife conservation, and flood control.

Storage will be provided in McPhee Reservoir on the Dolores River. All project water will be released from the reservoir to the potential Dove Creek Canal which, with other project branch canals and existing systems, will deliver the water to the land. The offstream Cahone, Ruin Canyon, and Monument Creek Reservoirs will be constructed as part of the distribution system to facilitate water regulation.

The project will provide irrigation water for 61,000 acres, including 32,340 acres that are not irrigated at present. About 1,500 acres of the land are in Indian ownership. About 6,100 acre-feet of municipal and industrial water annually will be provided for the communities of Dove Creek and Cortez, Colorado.

	McPhee	Cahone	Ruin Canyon	Monument Creek
Type	Earth	Earth	Earth	Earth
Height (feet above streambed)	268	75	169	107
Crest length (feet)	1,300	2,000	2,350	5,000
Reservoir capacity (acre-feet)	364,000	4,340	16,400	5,040

A contract was executed April 9, 1971 between the Colorado State University and the Bureau of Reclamation for establishment and operation of a research and demonstration farm in southwestern Colorado.

The Colorado State University has leased approximately 350 acres of irrigable land located immediately above the Lone Pine Lateral of the Montezuma Valley Irrigation Company system to be used for the research and demonstration purposes. Water has been obtained from the Montezuma Valley Irrigation Company and an operator for the farm has been hired. The Bureau has secured topographic maps of the farm.

The farm is being jointly financed by the Colorado State University, the Bureau of Reclamation, Four Corners Regional Commission, and the Dolores Water Conservancy District.

j. San Miguel Project

Advance planning studies were initiated early in fiscal year 1972.

The San Miguel Project will regulate flows of the San Miguel River for irrigation, municipal and industrial use, fish and wildlife conservation, recreation, and flood control.

Storage of water will be provided at the Saltado Reservoir on the San Miguel River. Part of the stored water will be released into the river for downstream uses, but the major part will be diverted

at the reservoir outlet into the Norwood Canal, the first link in a chain of canals and reservoirs that will further control the water and convey it to places of use. This chain will include in successive order the Norwood Canal, Naturita Reservoir, Basin Canal, Radium Reservoir, and Paradox Canal. Existing irrigation reservoirs and distribution systems will be integrated with project works. Some lands above project facilities will be served by exchange.

The project will irrigate 38,950 acres, including 26,420 acres that have no present water supply. It will provide 44,000 acre-feet of water annually for municipal and industrial uses associated with the area's mineral and forest resources.

	Saltado	Naturita	Radium Reservoir Radium Dam	Radium Reservoir Stone Cabin Dam
Type	Earth	Earth	Earth	Earth
Height (feet above streambed)	278	207	77	98
Crest length (feet)	1,470	2,760	3,700	575
Reservoir capacity (acre-feet)	72,600	9,200	25,600	(same)

k. West Divide Project

Advance planning studies are scheduled to be undertaken in fiscal year 1974, depending upon availability of funds. The Senate and House Committees on Appropriations approved the acceptance of $30,000 in contributed funds from the State of Colorado and local interests. The funds will be used in fiscal year 1972 for gathering preliminary data preparatory to initiating advance planning studies in fiscal 1974.

The West Divide Project is planned primarily to provide water for irrigation and for municipal and industrial use in connection with development of oil shale reserves.

Crystal River flows will be regulated at Placita Reservoir. Some reservoir water would be released directly to the river for downstream use. Most of the releases will be diverted into the Huntsman Canal, which will supply other project canals in conveying the water westward. About 17 miles of the Huntsman Canal will be in tunnel. Yank Creek Reservoir will be constructed on North Thompson Creek to meet water needs in the eastern portion of the project area.

About 39,920 acres will be irrigated, including 18,890 acres not presently irrigated. About 77,500 acre-feet of water annually will be made available in the Colorado River or in project canals for municipal and industrial uses.

	Placita Reservoir	Haystack Reservoir	Yank Creek Reservoir
Type	Earth	Earth	Earth
Height (feet above streambed)	301	132	188
Crest length (feet)	1,630	1,350	1,540
Reservoir capacity (acre-feet)	105,660	7,590	9,210

2. COLORADO AND NEW MEXICO

a. Animas-La Plata Project

Advance planning studies were initiated in fiscal year 1971. Aerial contact prints and topographic overlays have been secured for the La Plata, Colorado area, and land classification has been started.

The Animas-La Plata Project will develop flows of the Animas and La Plata Rivers for irrigation, municipal and industrial use, recreation, and fish and wildlife conservation.

Animas River water will be regulated at a reservoir site yet to be selected. The Bureau of Mines is currently preparing an appraisal of mineral values and land acquisition costs for Howardsville Reservoir. Water will be conveyed in the Animas Diversion Canal to the La Plata River Basin. Some water will be diverted from the Animas River for municipal use at Durango, Colorado, and Aztec and Farmington, New Mexico. Part of the Durango water will replace present diversions to the city from the Florida River, permitting the replaced water to add to the supply for the Florida Project.

Water delivered to the La Plata Basin and unused flows of the La Plata River will be regulated in the offstream Hay Gulch, Three Buttes, and Ute Meadow Reservoirs and distributed by private and project works for irrigation and industrial uses associated with the area's extensive coal fields.

3. COLORADO AND WYOMING

a. Savery-Pot Hook Project

Construction of the Savery-Pot Hook Project as a participating project was authorized by Congress in September 1964. The project is located in Moffat County, Colorado, and Carbon County, Wyoming. Principal project features consist of two storage reservoirs—the Savery Reservoir and the Pot Hook Reservoir—and a system of canals to provide a full supply of project water to 10,940 acres of land in Colorado and 6,980 acres in Wyoming and a supplemental water supply to 3,640 acres of inadequately irrigated land in Colorado and 10,690 acres in Wyoming. The project will also provide benefits to recreation, fish and wildlife, and flood control.

Advance Planning

A draft of the definite plan report was submitted to the Commission and the Denver Office of the Bureau of Reclamation for

review in July 1971. Start of construction is dependent on availability of funds.

4. NEW MEXICO

a. Hammond Project

The Hammond Project, located in northwestern New Mexico, was completed late in 1962 and has been operated and maintained by the Bureau of Reclamation through the 1971 irrigation season. Water has been supplied to project lands on a rental basis. The project facilities consist of the Hammond Diversion Dam on the San Juan River, the main gravity canal, a hydraulic turbine-driven pumping plant, three main laterals, and distribution laterals.

The water table has risen sufficiently in several areas to indicate a definite need for drainage. The first segments of drains, including 0.1 mile of open and 2.4 miles of closed drain, have been completed. During 1971 cable-tide structural steel jacks were installed for erosion control in Armenta Canyon adjacent to Armenta Siphon; work was initiated under the contract for lowering Armenta Siphon; and a contract was awarded for constructing Sullivan Wasteway from the Main Canal. Collection of field data was continued for other structures and erosion control facilities to add necessary safeguards for operation of project facilities.

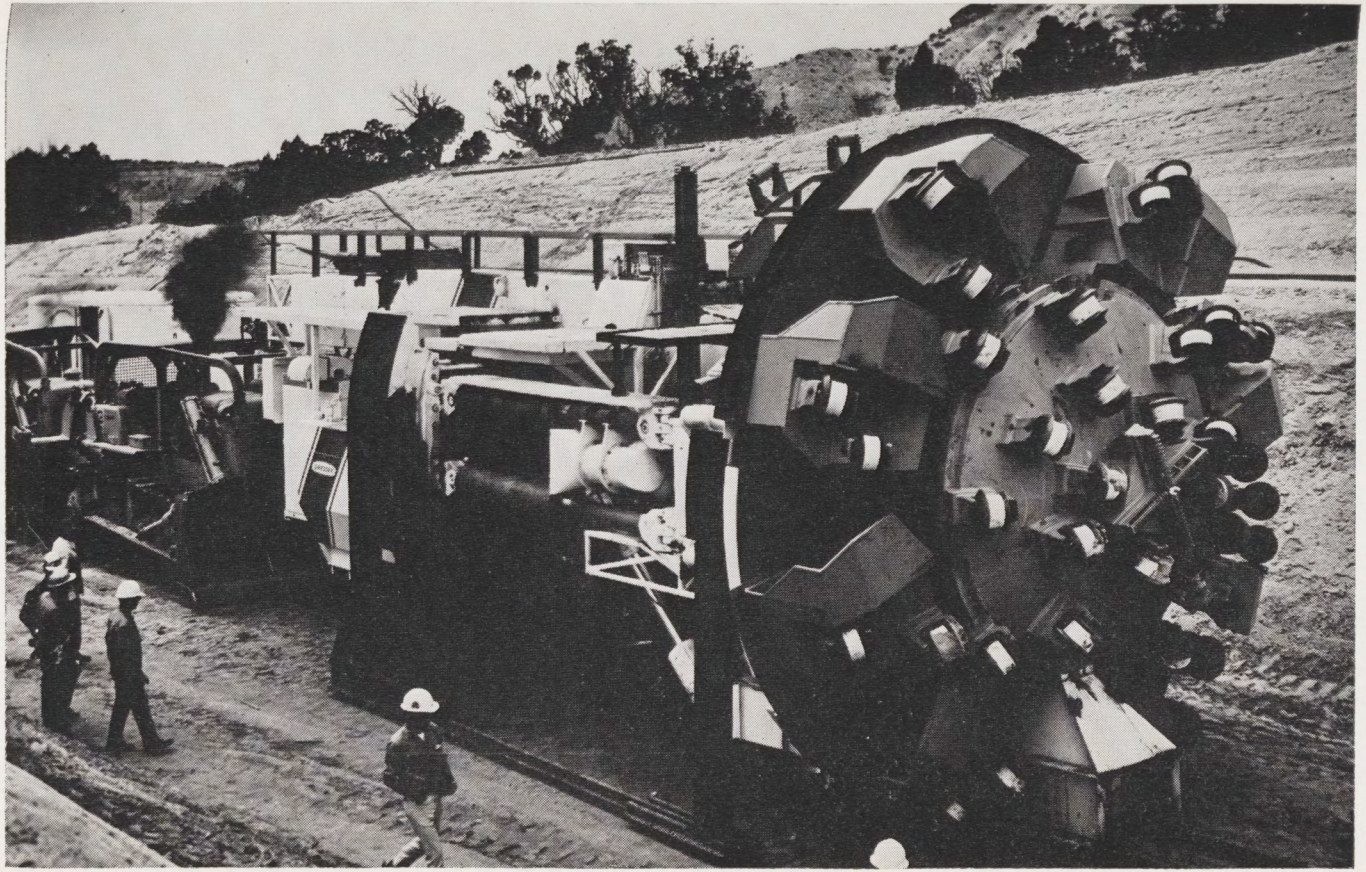
The project provides irrigation water for 3,933 acres, of which approximately 2,095 acres are now irrigated. Project lands are divided into 62 farms (23 full-time and 39 part-time).

b. Navajo Indian Irrigation Project

The Navajo Indian Irrigation Project was authorized for construction by Public Law 87-483 of the 87th Congress as a Bureau of Indian Affairs project. The bill was signed into law by the President on June 13, 1962. The project, authorized as a participating project of the Colorado River Storage Project, is being constructed by the Bureau of Reclamation for the principal purpose of furnishing irrigation water to approximately 110,630 acres of land. An average annual diversion of 508,000 acre-feet of water will be required from Navajo Reservoir for delivery to project lands.

Location

The project lands proposed for irrigation are situated on an elevated plain south of the San Juan River in San Juan County, in northwestern New Mexico. The project lands range in elevation from 5,580 feet to 6,450 feet and lie from 200 to 1,000 feet above the



U. S. Bureau of Reclamation Photo

A Dresser Tunnel Borer used to excavate tunnels to carry water for the Navajo Indian Irrigation Project, New Mexico.

river. The project area has a temperate and semi-arid climate with a frost-free growing season of about 160 days. The annual average precipitation is only about eight inches with about half of this amount occurring as rainfall during the growing season. Irrigation is necessary for successful crop production in the San Juan River Basin. The irrigable lands in the project are well suited to the cultivation and production of adapted crops. Under irrigation, it is expected that the lands will be devoted primarily to alfalfa, corn, beans, and irrigated pasture, with some acreage devoted to orchards and vegetables. All of the lands in the project are presently undeveloped and, due to the lack of moisture, are used only for grazing.

Project Plan

The proposed plan of development of the Navajo Indian Irrigation Project depends upon the construction of facilities to provide a water supply for the irrigation of lands to be developed solely for Indian use as a fulfillment of a national obligation to the Navajo Tribe. The project area will include some off-reservation lands, the acquisition of which, for inclusion in the reservation, is provided in the legislation. The project works will consist of a canal system, laterals, pumping plants, a small powerplant, and additional related facilities as may be required.

The project is adapted to serve municipal and industrial water users as well as its primary purpose of irrigation. The officials of the State of New Mexico anticipate that a relatively large municipal and industrial water demand will develop in the San Juan River Basin. The authorizing Act provides for such purposes over and above that needed for irrigation on the Navajo Indian Irrigation Project.

Approximately 32.2 miles of Main Canal are required to convey the water supply from Navajo Reservoir to the initial lands to be served. Under the present construction schedule, it is anticipated that approximately 10,000 acres will be developed for irrigation annually after delivery of water is made to the first lands to be served.

To complete the project works, as currently planned, will require the construction of approximately 600 miles of open canal and laterals, 9.0 miles of siphons, and 13.1 miles of tunnel to convey the water to the project lands. It will also require construction of a power plant and required pumping plants to serve lands situated above the Main Canal. Cutter Dam will be constructed to take advantage of the economic benefits afforded by utilizing a natural channel for a reach of the Main Canal. Gallegos Dam, an earthfill dam, will be constructed to create a pump-storage reservoir that will

U. S. Bureau of Reclamation Photo

Navajo farmhands harvesting onions at the San Juan Branch Agricultural Experiment Station located within the Navajo Indian Irrigation Project area, New Mexico.

be filled by pumping during the off-irrigation season. This reservoir will provide an additional water supply which can be used during the peak irrigation requirement months of June and July. As construction of the canal system progresses, farm units will be developed for irrigation.

The Bureau of Reclamation is responsible for the design and construction of irrigation facilities to the turnouts to the individual farm units. The development of the farm units rests with the Bureau of Indian Affairs and the Navajo Tribe. Such work would include the farm distribution system, land leveling, farm drainage, and construction of improvements.

Cost and Repayment

The total estimated construction cost for the project is $206,000,000 (P. L. 91-416). The costs associated with the development of farm units are not considered a part of the construction cost for which the Bureau of Reclamation has the responsibility.

The authorizing act provides that the cost allocated to Indian, tribal, or restricted lands served by the project, and beyond the capability of such lands to repay, shall be nonreimbursable. This is in recognition of the fact that assistance to the Navajo Indians is the overall responsibility of the entire nation.

Economic Benefits

The Navajo Indian population has grown to over 90,000 persons, and is increasing at such a rate that it is estimated it will equal 300,000 in the year 2000. It is therefore necessary that such measures as the Navajo Indian Irrigation Project must be undertaken to keep pace with this population growth.

The project will provide irrigation benefits that will give the Navajo people a better standard of living. It will provide a means of self-support for 850 families on the farm units and create employment for an additional 1700 families. It is estimated the project will provide a substantial part of the livelihood for about 17,000 of the Navajo people directly from the on-farm operations. Approximately 16,000 additional people would obtain a substantial part of their livelihood from the agriculturally oriented industries required by development of the project.

Construction of the project can be expected to generate about 8,400 man-years of on-site work and to require an equivalent of more than 12,000 man-years of work in other areas throughout the country

in providing the necessary services, materials, and equipment. An additional stimulus to the economy is roughly equivalent to another 27,000 man-years of employment that will result from the increased demands by on- and off-site workers for such items as clothing, food, furniture, gasoline, and other consumer goods.

To satisfy the needs of the farm families that will occupy the project lands will require the construction of schools, housing, farm buildings, roads, fences, and utility installations. There will also be increasing demands for such equipment as farm machinery, trucks, and automobiles.

The development of the project will have an uplifting economic impact on the livelihood of the Navajo tribe. The project will be a major factor in the transition of the traditionally pastoral Navajos from a simple subsistence economy of raising sheep to participating in the agricultural economy of the nation.

Construction

Because the Executive Department of the Federal Government has failed to approve the appropriation of Federal funds in sufficient amounts, construction progress on this project has been unreasonably slow for the past nine years.

As of October 1, 1970, there were two major contracts in force, and a third contract was awarded on October 23, 1970.

The oldest contract in force is for the construction of 2.5 miles of concrete-lined main canal, and two 17.5-foot-diameter siphons totaling 700 feet in length. The contractor completed about 55 percent of the work this year; and, on October 1, 1971, the contract was about 70 percent completed. The total estimated cost is $2,103,537. The work is expected to be completed early next spring after the winter shutdown.

The contract for Cutter Dam, which was awarded on September 30, 1970, was about 60 percent completed at the end of the report year. The dam will be about 90 feet high, 950 feet long, and is expected to cost $2,322,665. The work is expected to be completed by July 1972.

The third contract, in the amount of $8,690,286, is for the construction of two 17.5-foot-diameter tunnels totaling over 3.5 miles long, and about 0.6 mile of main canal and appurtenant structures. At the end of the report year, the work was about 10 percent completed.

c. San Juan-Chama Project

The San Juan-Chama Project was authorized as a participating project of the Colorado River Storage Project by Public Law 87-483, signed June 13, 1962 (76 Stat. 96).

Location

The project is designed to make possible an average annual diversion of 110,000 acre-feet of water from the upper tributaries of the San Juan River in the Upper Colorado River Basin, through the Continental Divide, for utilization in the Rio Grande Basin, New Mexico. The imported waters are to be used to provide an irrigation water supply for 39,300 acres of land in the Rio Grande Basin. These lands in the Cerro, Taos, Llano, and Pojoaque tributary irrigation units consist of 22,800 acres presently irrigated and 16,500 acres presently dry land. A supplemental water supply will also be provided for irrigation of 81,600 acres in the Middle Rio Grande Conservancy District.

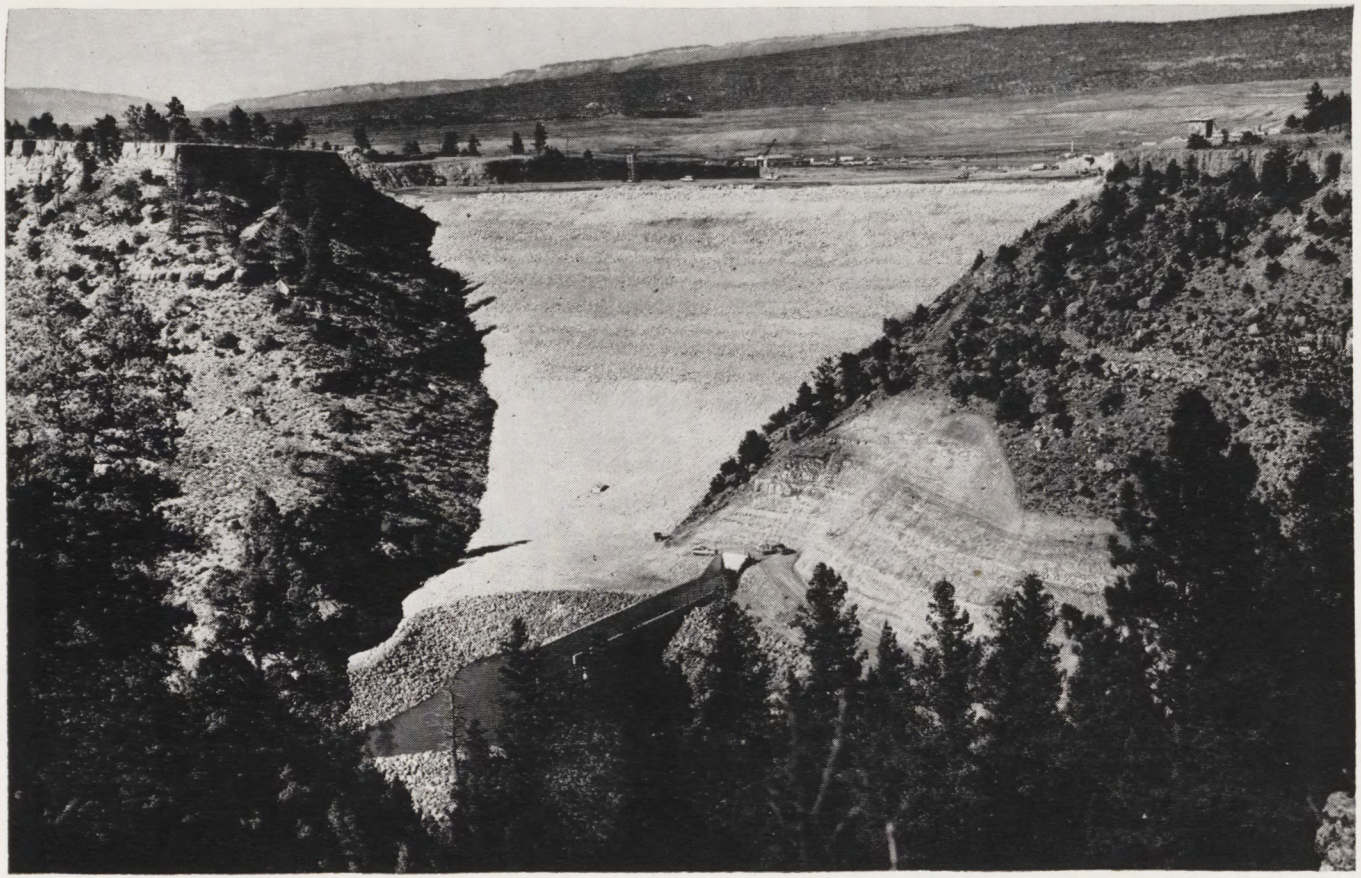
Initial authorization is limited to the plans for diverting and regulating the project water and for furnishing water to the city of Albuquerque and for irrigation.

Project Plan

Principal construction features include three diversion dams, three feeder conduits, three tunnels, two river siphons, and one storage dam and reservoir.

Blanco Diversion Dam on Rio Blanco will divert water to the Blanco feeder conduit. The Blanco feeder conduit is to consist of a closed conduit of 520 cubic feet per second capacity conveying water from Blanco Diversion Dam to Blanco Tunnel. Blanco Tunnel is planned as a concrete-lined structure with 520 cubic feet per second capacity to carry water 8.6 miles from Rio Blanco to Little Navajo River. Little Navajo River siphon, a concrete siphon with a capacity of 520 cubic feet per second, will carry water under Little Navajo River to the Oso Tunnel. The Little Oso Diversion Dam on the Little Navajo River upstream from the Little Navajo River siphon will divert water from the Little Navajo River through the Little Oso feeder conduit, a closed conduit with a capacity of 150 cubic feet per second, to the entrance to the Oso Tunnel.

The Oso Tunnel will be a concrete-lined structure with a capacity of 550 cubic feet per second and a length of 5.22 miles, from Little Navajo River to Navajo River. The 550-cubic-foot-per-second Navajo River siphon is to carry water under the Navajo River where



U. S. Bureau of Reclamation Photo

Heron Dam of the San Juan-Chama Project, New Mexico

the Oso Diversion Dam diverts water to the Oso feeder conduit. This conduit, with a capacity of 650 cubic feet per second, will run from Oso Diversion Dam to Azotea Tunnel.

The 12.8-mile-long concrete-lined Azotea Tunnel will convey water from Navajo River to Azotea Creek in Rio Grande Basin. These imported waters will flow down Azotea and Willow Creeks 11.78 river miles to Heron Reservoir.

The regulating and storage reservoir will be formed by Heron Dam on Willow Creek just above the point where Willow Creek enters the Chama River. The dam will be an earthfill structure about 265 feet high and will form the reservoir with a capacity of about 400,000 acre-feet, with a surface area of about 6,000 acres. The spillway will have a capacity of 450 cubic feet per second, and the outlet works will have a capacity of 4,220 cubic feet per second.

Construction is also to include the enlargement of the outlet of the existing El Vado Dam so that releases from Heron Reservoir can be bypassed through El Vado Reservoir as desired.

Benefits

The project will provide a dependable municipal and industrial water supply for the city of Albuquerque, supplemental irrigation water for the Middle Rio Grande Conservancy District, and an additional supply of irrigation water for the Cerro, Taos, Llano, and Pojoaque tributary units. Substantial fish and wildlife and recreational benefits will be created by the project, particularly Heron Reservoir.

Construction

As of October 1, 1970, there was only one major construction contract in force, and none was awarded the following year. This contract was for the construction of Heron Dam and the relocation of New Mexico State Highway 95. The contractor shut down all operations in early November 1970, with the contract 95 percent complete. The contractor resumed operations on April 15, and completed the contract on June 9, 1971. The final cost for the dam and road relocation was $9,351,583. This completes all of the major features of the diversion and storage element of the project.

Funds are now available to start work on the Pojoaque Unit, one of the tributary irrigation elements, in fiscal year 1972. Foundation investigations are underway for Nambe Falls Dam, the principal feature of the unit. The dam is planned to be about 132 feet high, a 400-foot-long mass concrete center section with an earth

abutment about 550 feet long. It will have a 115-foot wide uncontrolled spillway in the concrete section. The estimated total cost for the structure is $2,560,000.

On January 3, 1971, the first water from the Colorado River Basin was diverted to the Rio Grande Basin through the project as a test of regulatory and measuring facilities.

5. UTAH

a. Central Utah Project (Initial Phase)

The Central Utah Project (Initial Phase) will provide water for irrigation, municipal and industrial use, and power generation. Benefits also will be realized in the fields of outdoor recreation, fish and wildlife conservation, flood control, water quality control, and area redevelopment. The Initial Phase consists of four units. Largest of these is the Bonneville Unit which involves diversion of water from the Uinta Basin to the Bonneville Basin and associated developments in both basins. The other three units — the Vernal, Upalco, and Jensen — provide for local development in the Uinta Basin.

In view of increased municipal and industrial water demands in Salt Lake County, the Bureau of Reclamation has rescheduled construction so that water deliveries could be started as early as 1973. The Bureau of Reclamation studies show that through joint use of present and new water conveyance features, available sources of water can meet the public water supply needs of Salt Lake County, including Salt Lake City, until about 1990.

On June 29, 1971, a petition was approved by the Central Utah Water Conservancy District for the Salt Lake Water Conservancy District to receive up to 50,000 acre-feet of municipal and industrial water annually.

Under the Bonneville Unit the Strawberry Aqueduct (now under construction) will intercept flows of Uinta Mountain streams as far east as Rock Creek and convey the water to the existing Strawberry Reservoir which will be enlarged by construction of Soldier Creek Dam. Stored water will be released through the Wasatch Mountains to the Central Utah area. Through various exchanges and by the construction of new facilities the water will be made available to an area extending from Salt Lake City about 75 miles south to the city of Nephi. Starvation Reservoir on Strawberry River with a feeder canal from Duchesne River will develop water for use in the Uinta Basin.

Under present plans 36,000 acre-feet of water annually will be diverted to the Sevier River Basin for supplemental irrigation in that area.

To convey water to the Sevier River Basin, a 29-mile canal from near the Nephi area to the existing Sevier Bridge Reservoir on the Sevier River will be built. Irrigation in the Sevier River Basin will be accomplished both by exchange of water with upstream reservoirs and by direct irrigation from the Sevier Bridge Reservoir.

The Central Utah Water Conservancy District signed a repayment contract in 1965.

i. Vernal Unit

The Vernal Unit, near Vernal, Utah, was the first unit of the Initial Phase of the Central Utah Project to be constructed. Project features include Steinaker Reservoir, offstream from Ashley Creek with a capacity of 38,200 acre-feet; Fort Thornburgh Diversion Dam; Steinaker Feeder Canal; and Steinaker Service Canal. Construction started in 1959 and was completed by 1962. The Vernal Unit, through storage of waters diverted from Ashley Creek, provides supplemental water to 14,700 acres and assures farmers an adequate, year-round supply of water; augments municipal water supply for three communities in Ashley Valley: Vernal, Maeser, and Naples by providing 1,600 acre-feet of municipal and industrial water; and provides recreation and fishing at Steinaker Reservoir.

Water storage and distribution facilities have been completed and turned over to the water users for operation and maintenance. Construction of drains continued throughout 1971, with completion of work on Block No. 1 Drains and initiation of construction on Block No. 2 Drains, comprised of 4.4 miles of buried pipe lines. Design data are being assembled for a 6.0 mile system of buried pipe drains to serve a third drainage-deficient area.

Construction

ii. Bonneville Unit

The Bonneville Unit will provide irrigation water to 43,740 acres of full-service lands, 112,790 acres of supplemental service lands; develop 133,500 kw. of power; and supply 79,000 acre-feet of municipal and industrial water.

The Starvation Dam complex has been completed. Starvation Reservoir filled and spilled for the first time on June 14, 1971.

Excellent progress continues on Soldier Creek Dam, Strawberry Reservoir enlargement and collection works. At Soldier Creek

U. S. Bureau of Reclamation Photo

Ground-breaking ceremonies for Soldier Creek Dam of the Central Utah Project.

Damsite both the upper and lower outlet works tunnels have been drilled and tunnel lining and control gate installation nearly completed in the lower outlet works tunnel. Excavations for the foundation and cutoff trench have been completed. Foundation grouting has started. Placement of earth work for the dam embankment is expected to start early in 1972.

Water Hollow Tunnel was completed about midyear. The Layout and Currant Creek Tunnels contractor began moling operations at Layout Tunnel June 25 and ceased operations September 22, 1971, due to exhaustion of funds. Nearly 30 percent of the 3.2 mile-long tunnel was bored in a 3-month period. The contractor also opened the Currant Creek outlet portal face and accomplished initial work for the Layout Creek diversion facilities. Other contractors completed the Currant Creek Field Station and the access road to the outlet portal of Stillwater Tunnel. Construction of facilities of the Bonneville Unit in the Salt Lake Valley was commenced in the fall of 1971, following award of construction contract for the initial 15.1-mile-segment of Jordan Aqueduct. Manufacture of the 78-inch inside diameter aqueduct pipe is progressing. Pipelaying operations are underway.

Preconstruction activities continue on other features of Bonneville Unit. Design and specifications work are progressing for Currant Creek Dam, Currant Creek Pipeline and Vat Tunnel.

The Draft Environmental Statement for Bonneville Unit is now nearing completion by the Bureau of Reclamation and is expected to be forwarded to the Commissioner of Reclamation early in 1972.

iii. Upalco Unit

The Upalco Unit Definite Plan Report was completed in May 1968. Start of construction is scheduled for fiscal year 1974 if funds become available.

The Upalco Unit will develop waters of Lake Fork and Yellowstone Rivers for irrigation, recreation, fish and wildlife, and flood control. Storage regulation will be provided as Taskeech Reservoir on Lake Fork below Moon Lake Reservoir. Total capacity of Taskeech Reservoir would be 78,400 acre-feet. Surplus flows of Yellowstone River will be diverted at the Bonita Diversion Dam and conveyed 8.5 miles in the 250-second-foot Taskeech Feeder Canal. Irrigation water will be released from the reservoir to Lake Fork and distributed from the stream through existing canal systems and through the 3.6-mile, 50-second-foot Taskeech Service Canal that will extend to Yellowstone River. The project will provide a

supplemental irrigation supply to 27,540 acres of non-Indian lands and 15,070 acres of Indian lands.

Part of the water in Taskeech Reservoir will replace irrigation storage presently provided in Twin Potts Reservoir and 14 upstream mountain lakes, and thus permit water levels in these facilities to be stabilized for fish and wildlife and recreation.

iv. Jensen Unit

Advance Planning

Funds have been provided to initiate construction in fiscal year 1972 on the Jensen Unit. Repayment contract negotiations are in progress. The definite plan report on the Jensen Unit is being revised. The project, located along the Green River in Uintah County east of Vernal, Utah will develop flows of the Green River to provide irrigation water for 4,080 acres — of which 3,640 acres would receive supplemental and 440 acres full-service water supplies. The project will furnish 18,000 acre-feet of municipal and industrial water annually for use in the vicinity of Vernal. It will also provide flood control and fish and wildlife benefits.

Project commitments will be met by releases of water from the Tyzack Reservoir to be constructed on Big Brush Creek with a storage capacity of 26,000 acre-feet, the 35-second-foot Tyzack Pumping Plant which empties into the 4.1-mile Tyzack Aqueduct, and the Burns Pumping Plant on the Green River.

b. Emery County

Emery County Project provides supplemental water for 18,004 acres of land and a full supply for 771 acres in Emery County in east-central Utah near the towns of Huntington, Castle Dale, and Orangeville. Principal components of the project include Joes Valley Dam and Reservoir on Cottonwood Creek with a storage capacity of 62,460 acre-feet, the Swasey Diversion Dam located about 10 miles downstream from Joes Valley, the 16-mile Cottonwood-Huntington Canal heading at the Swasey Diversion Dam, the Huntington North Dam and Reservoir with a capacity of 5,420 acre-feet, and the 3½-mile Huntington North Service Canal. Laterals and drains will be constructed as required. Recreation facilities are provided at the project reservoirs. The Emery County Project was completed in June 1966.

Construction

During the year buried membrane lining was placed in seven

segments of Cottonwood Creek-Huntington Canal and a bridge was built for farm access. Collection of field data was started for pilot drains for the first block of lands needing drainage.

6. WYOMING

a. Lyman Project

The Lyman Project is located in Uinta County in southwestern Wyoming near the town of Lyman. The project will deliver supplemental water to 42,674 acres of presently irrigated lands. Two dams — the Meeks Cabin and China Meadows — will comprise the principal features of the project.

Construction

Meeks Cabin Dam was completed in the spring of 1971 and the new reservoir partially filled during the snowmelt runoff season. During summer months about 2.3 miles of boundary fence were erected around the reservoir, and a two-cable guard fence erected on either side of the crest of the dam. Preconstruction activities were carried on throughout the year for China Meadows Dam, with designs and specifications being prepared.

A draft Environmental Statement for China Meadows Dam will be sent to interested Federal and State agencies and to private organizations early in 1972 for their review and comments.

b. Seedskadee Project

The Seedskadee Project, located in the Upper Green River Basin in southwestern Wyoming, was authorized in 1956, and construction of Fontenelle Dam and Reservoir was completed in 1965. In early 1962 the Congressional Committee, the Bureau of Reclamation, and a special Wyoming Projects Review Team became concerned with signs of uneconomic operations on several Reclamation projects in Wyoming. In March 1962 all construction on the irrigation facilities was discontinued pending completion of additional studies.

The Seedskadee Project Development Farm was established in 1964 to determine and demonstrate the most effective, economic, and best adapted water management practices, crop production and livestock handling techniques, and their relationships to optimum size farm units and type of irrigation systems. These data have been assembled, analyzed, and used as a primary basis for inputs to current studies in preparation of a definite plan report in the area selected for initial development. The development farm, which has

been operated during the past 6 years by the University of Wyoming under a contract which will expire December 31, 1971, will be leased to a local rancher.

A plan for initial development of the Seedskadee Project still under study could provide for irrigation of 9,800 acres of dry irrigable land in the original Blocks 1 and 2 on the west side of the Green River immediately below Fontenelle Dam and Reservoir. The remaining 34,000 acres, for which water has been reserved for irrigation, would be deferred for later stage development.

Fontenelle Dam and Reservoir (total capacity of 345,000 acre-feet) will provide water for irrigation and for municipal and industrial needs. The 10,000-kilowatt powerplant at the toe of the dam began operation in May 1968. Development of the wildlife refuge downstream from the dam is proceeding as an adjunct to the project under Section 8 of the Colorado River Storage Project Act.

Several miles of canals, laterals, and drains will be constructed in the initial area of development to convey water from the reservoir to 22 new farm units.

Recreation

Recreation facilities which have been provided at Fontenelle Reservoir include a boat ramp, parking areas, campground, picnic sites, drinking water sources and toilets.

c. Eden Project

The Eden Project is located in Sweetwater County, southwestern Wyoming, about 45 miles north of Rock Springs. Major physical features consist of the Big Sandy Reservoir (39,700 acre-feet) and the Eden Reservoir (7,500 acre-feet). There are 113 miles of canals and laterals to serve the project. The present project area under water right is 17,088 acres.

Construction started in 1950 and was completed in 1960. First water was available through Bureau-constructed works in 1953. By contract dated June 8, 1950, the Eden Valley Irrigation and Drainage District assumed responsibility for repayment of construction cost of $75 an acre over a 60-year period with the remaining costs to be repaid from revenues of the Colorado River Storage Project. Operation and maintenance was turned over to the water users on January 1, 1970.

Short water supplies in some years, short growing season, limited crop production, general economic conditions, and farm management have been factors adversely affecting farm income.

The Farmers Home Administration, Agricultural Stabilization and Conservation Service, the Soil Conservation Service, and the Bureau of Reclamation have been active in improving adverse project conditions.

All work was completed early in 1971 under contracts awarded the previous year for placing compacted earth linings in several laterals serving the Eden and Farson areas, increasing the capacity of farm turnouts and adding structures to improve operation of the lateral system. In the Fall of 1971 a $123,000 contract was awarded for placing compacted earth linings in an additional 2.1 miles of Eden Area laterals, enlarging about 1.1 miles of existing laterals, increasing the capacity of seven turnouts and constructing a 0.5-mile-long wasteway.

Throughout the year preconstruction activities have been directed toward assembly of design data for modification of the outlet and dike protection for the existing Eden Reservoir and lining various reaches of Eden Canal. Investigations are continuing to determine the need for providing additional drainage through either deepening existing drains or constructing new facilities.

H. POTENTIAL PARTICIPATING PROJECTS

In carrying out further investigations of projects under Federal Reclamation Laws in the Upper Colorado River Basin, the Secretary of the Interior is directed to give priority to completion of planning reports on a number of potential projects.

The Bureau of Reclamation, so far as limited funds and personnel will permit, is continuing its studies on these projects. Considerable progress in investigations has been accomplished during the past year.

1. FEASIBILITY INVESTIGATIONS

COLORADO

a. Yellow Jacket Project

The feasibility report on the Yellow Jacket Project, completed in October 1968, is being revised. The plan for the project includes storage regulation at Lost Park and Ripple Reservoirs in the White River drainage for development of lands in the White River Basin. The project would also include storage at Thornburg Reservoir for irrigation of lands in the Axial Basin in the vicinity of Milk Creek. The project would provide a supplemental irrigation supply to

3,700 acres of land and a full supply to 19,900 acres of land. The project would also develop municipal and industrial water supplies and provide recreation and fish and wildlife benefits.

b. Battlement Mesa Project

A proposed feasibility report on the Battlement Mesa Project was completed in 1967. Review of this report has not been completed. The project would develop the flows of Buzzard Creek to provide supplemental irrigation water to 3,130 acres of land and a full water supply to 6,340 acres of land, develop 3,000 acre-feet of municipal and industrial water, and provide benefits to recreation and fish and wildlife. Owens and Buzzard Creek Reservoirs would be constructed on Buzzard Creek to regulate and store excess flows of the stream. Irrigation water released from the reservoirs would be distributed through a system of project facilities, including the Harrison, Brush Creek, and Colorado Canals, the Cheney Lateral, and a series of smaller laterals branching from the main canals.

c. Bluestone Project

A proposed feasibility report on the Bluestone Project was completed in August 1971 and is being reviewed. This report summarizes results of feasibility studies for the Bluestone Project and reconnaissance studies for a potential project extension. The project would provide a supplemental irrigation supply to 1,880 acres of land, a full supply to 750 acres of land, and 61,000 acre-feet of water for municipal and industrial use. The extension would involve the construction of Una Reservoir, a major storage feature on the Colorado River, to provide hydroelectric power, municipal and industrial water, recreation, fish and wildlife, flood control, and river regulation.

d. Grand Mesa Project

Feasibility investigations are well advanced. A field draft of the feasibility report has been reviewed and revisions are in progress. Completion of a proposed feasibility report is scheduled for fiscal year 1972.

e. Upper Gunnison Project

Feasibility designs and estimates for all project features have been completed. The financial and economic analysis studies are to be finalized. Completion of a feasibility report is scheduled for fiscal year 1972.

f. Basalt Project

Assembly of design data is in progress preparatory to making feasibility designs and estimates of the project features. Other phases of the feasibility investigations are proceeding satisfactorily. Completion of a feasibility report is scheduled for fiscal year 1973.

g. Lower Yampa Project

Feasibility investigations were initiated in fiscal year 1969. Land classification and drainage field work has been completed. Plan formulation and water supply studies are in progress. The proposed feasibility report is scheduled for completion in fisical year 1974.

UTAH

a. Central Utah Project (Ultimate Phase), Uintah Unit

The Unitah Unit was conditionally authorized by the Colorado River Basin Project Act of 1968. Construction is contingent upon completion and submission to Congress of a feasibility report and certification by the Secretary of the Interior that the unit is economically justified and financially feasible.

The project would develop the flows of the Uinta and Whiterocks Rivers to provide supplemental irrigation water to 45,150 acres of land and a full supply to 7,820 acres of new land, develop 1,000 acre-feet of municipal and industrial water, and provide benefits to recreation, fish and wildlife, and flood control.

Uinta and Whiterocks Reservoirs would be constructed on Uinta and Whiterocks Rivers, respectively, to regulate and store surplus flows for project use. Project water would be delivered through present distribution systems requiring some rehabilitation. Stabilization of 13 upstream reservoirs will provide exchange water for irrigation as well as provide recreation and fish and wildlife benefits.

The unit will be reevaluated when the Water Resource Council's new procedures for plan formulation and evaluation of water and related land resources projects are available. This work is scheduled to be completed in fiscal year 1973.

b. Central Utah Project (Ultimate Phase), Ute Indian Unit

Feasibility investigations are currently in progress on the Ute Indian Unit. A planning report is scheduled for fiscal year 1976.

The Ute Indian Unit would develop Colorado River water for irrigation, municipal and industrial use, and power production. The Unit would serve both Indian and non-Indian lands in the Unita Basin. Municipal and industrial water would be developed for use in the Uinta Basin to facilitate development of vast deposits of phosphate, oil shale, minerals, and other natural resources. Water would also be diverted from the Uinta Basin to the Bonneville Basin to help satisfy the expanding water requirements of the Wasatch Front area.

Under the Colorado River Basin Project Act a planning report must be completed on or before December 31, 1974, to enable the United States of America to meet the commitments heretofore made to the Ute Indian Tribe of the Uintah and Ouray Indian Reservation under an agreement dated September 20, 1965.

2. RECONNAISSANCE INVESTIGATIONS

UTAH

a. Paria-San Rafael Investigations

Reconnaissance investigations initiated in fiscal year 1969 are nearing completion. The study area includes the San Rafael, Dirty Devil, Escalante, and Paria River Basins. The study will provide a general appraisal of the overall water and related resources and development potentials of the area. A reconnaissance report is scheduled to be completed in fiscal year 1972.

WYOMING

a. Green River Project

A reconnaissance report on potential development in the Green River in Wyoming is being prepared for distribution. Alternative plans of development to supply municipal and industrial water for in-basin uses, to export municipal and industrial water to North Platte River Basin, and to provide water for lands west and/or east of Green River are outlined in the report.

I. RESERVOIR OPERATIONS

The 1971 snowmelt runoff in the Upper Colorado River Basin during the period April through July totaled 8,378,000 acre-feet which is 101% of the long-term average. Runoff for the total water

year ending September 30, 1971, was 12.3 million acre-feet which was disposed of as follows:

	Acre-Feet
Net Storage Increase	2,200,000
Bank Storage	1,000,000
Evaporation	500,000
Releases to Lower Colorado River Basin	8,600,000
Total	12,300,000

All of the Upper Basin reservoirs had a net gain in storage during water year 1971 except Blue Mesa and Navajo Reservoirs from which 287,000 acre-feet and 268,000 acre-feet, respectively, were moved downstream. Most of the system gain, about 2,200,000 acre-feet, was in Lake Powell. During the same 12-month period, Lake Mead in the Lower Basin gained about 117,000 acre-feet of storage.

Lake Powell reached an all-time high water surface elevation of 3622.3 feet above mean sea level on July 11, 1971, with storage of 14,490,000 acre-feet. The lake will recede about 16 feet from the all-time high before spring runoff starts in 1972.

Approximately 8.6 million acre-feet of water were released from Upper Basin reservoirs to the Lower Basin during water year 1971. The annual release during water year 1972 should be about 9.0 million acre-feet in order to deliver 75 million acre-feet to the Lower Basin in the 1963-72 decade under Article III (d) of the Colorado River Compact of 1922. This particular 10-year period is especially critical because small releases of water were made during the first two years when minimum power pools were being filled in Lake Powell and Flaming Gorge Reservoir. All of the water released will be used to generate electric energy for customers in both the Upper and Lower Basins.

The water surface of Flaming Gorge Reservoir on the Green River receded slightly from its seasonal high at elevation 6022 feet with storage of 3,046,000 acre-feet of water to an end-of-year elevation of 6019 feet. The April-through-July runoff above the reservoir was about 1,900,000 acre-feet, or 163% of normal. Scheduled releases of water for power generation should draw the reservoir down to about elevation 6008 feet with storage of about 2,570,000 acre-feet by the time of spring runoff in 1972.

Fontenelle Reservoir on the upper Green River in Wyoming has been drawn down from full at elevation 6506 feet, to elevation 6504 with storage of 326,000 acre-feet of water by the end of the

water year. During the coming winter the reservoir will be drawn down to approximately elevation 6482. In future years the reservoir will normally fill each spring to elevation 6506 feet and be drawn down to between elevation 6480 and 6485 feet late each winter. With this type of fluctuation, all purposes of the project will be served and minimum amounts of water will bypass the powerplant.

The water surface level of Navajo Reservoir on the San Juan River reached a seasonal high in the fall of 1971 of elevation 6031 feet above mean sea level and a live storage content of 1,020,000 acre-feet of water. The reservoir should recede to elevation 6010 feet by the end of March 1972. The April-July snowmelt runoff above Navajo Reservoir during 1971 was only about 305,000 acre-feet or 37% of the long-term average.

On the Gunnison River, Blue Mesa Reservoir had a seasonal high elevation of 7696 feet above mean sea level with a storage content of 628,000 acre-feet of water on July 19, 1971. Blue Mesa Reservoir did not fill during water year 1971 due to a drawdown in March to elevation 7439 feet for construction of a boat ramp at Lake Fork Recreation Area. The 1971 April-July snowmelt runoff above Blue Mesa Reservoir was 708,000 acre-feet or about 90% of normal.

Morrow Point Reservoir, located immediately downstream from Blue Mesa Dam, filled and occasionally spilled during the summer. Morrow Point, which is predominately controlled by the larger Blue Mesa Reservoir will operate at or near full capacity regardless of the amount of snowmelt runoff. Since normal leakage around the spillway gates caused icing problems during the winter, these gates were thoroughly sealed with bentonite during 1971. The gates will henceforth be operated only in emergencies.

Generating Unit No. 1 at Morrow Point Powerplant went into commercial production on December 23, 1970, followed by Unit No. 2 on January 26, 1971.

J. ATMOSPHERIC WATER RESOURCES PROGRAM IN THE UPPER COLORADO RIVER BASIN

Scientific investigation of atmospheric water resources continues in the mountains of the Upper Basin States. The scope of the investigation has been enlarged from purely experimental studies by adding a pilot-type project.

Small-scale cloud-seeding experiments are being conducted in the Bridger Range of the Wind River Mountains in western Wyoming by the University of Wyoming.

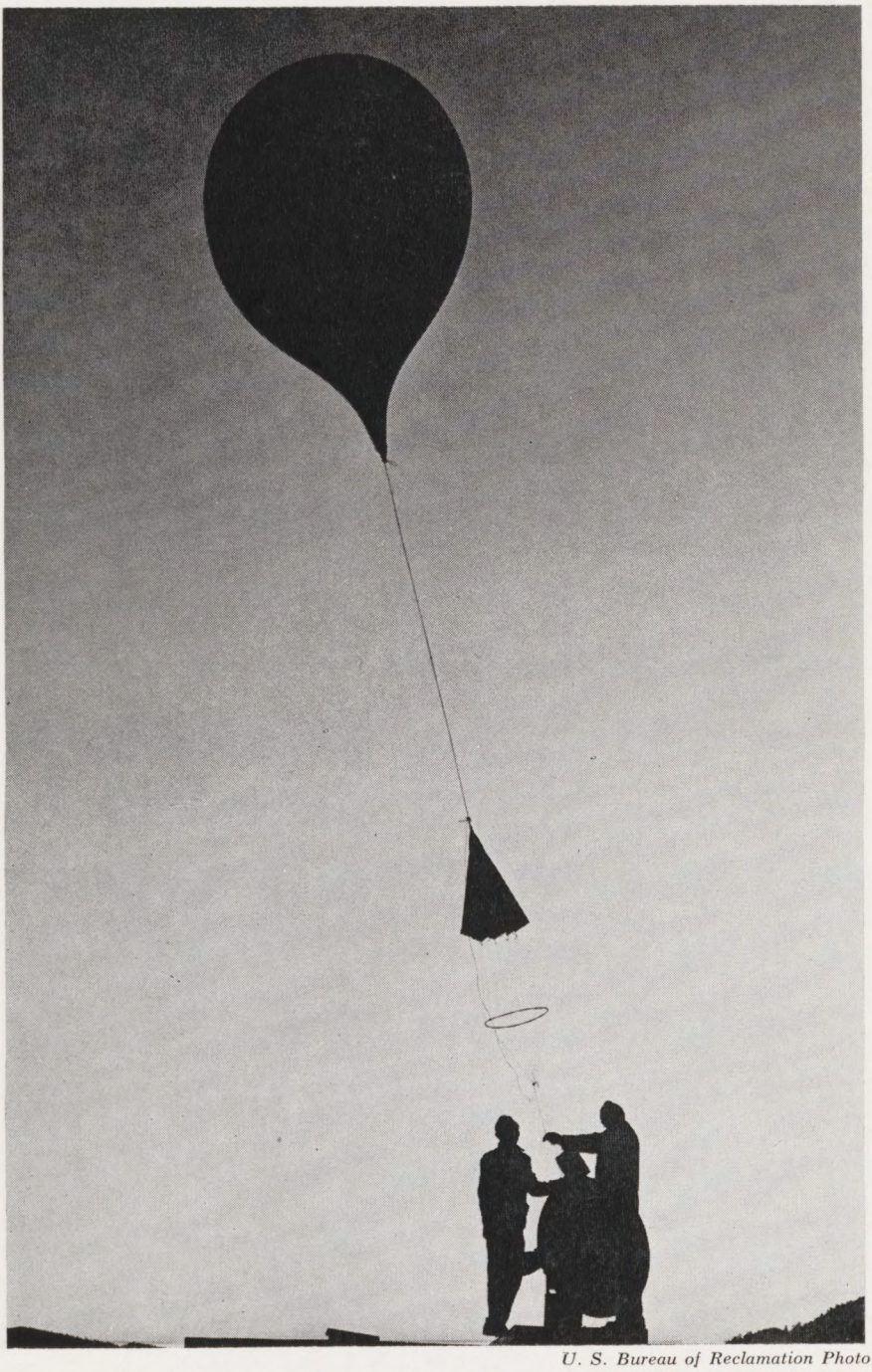
Important to the Reclamation program are winter seeding experiments conducted by Colorado State University at Climax, Colorado, under a grant from the National Science Foundation. These experiments, now in their eleventh consecutive year, are designed to show the quantitative change in precipitation by cloud seeding and to determine criteria for optimum seeding conditions. In the past, these experiments have been based on ground seeding and have proven that method; although there has been increasing interest in the use of pyrotechnics (rockets) for seeding and in the employment of observation aircraft.

The Colorado River Basin Pilot Project in the San Juan Mountains of southwestern Colorado is the last development step before possible full-scale cloud-seeding operations in the Upper Colorado River Basin. The prime objective of the project is to provide sound evaluation of precipitation increases from operational-type cloud seeding over large areas. Preliminary meteorological measurements and project design studies were made in the project area during the winter of 1968-69. Equipment and instrumentation, except silver-iodide generators, were tested during the winter of 1969-70. A contract for the silver-iodide generators, their installation and operation, was awarded to EG&G, Inc., with headquarters at Albuquerque, New Mexico. The silver-iodide generators were installed during the summer of 1970 and seeding began in the winter of 1970-71. A minimum of four winter seasons of operations is considered necessary to adequately test and evaluate the project. There are about 90 days of snowfall in the area per year. About 40 of these days are suitable for seeding, and about half of these will be seeded on a randomly selected basis. Thus the results of seeded events will be compared with those of unseeded events at the conclusion of the pilot project in 1974.

This area is a high-production snowpack location which contributes substantially to the flow of the Colorado River through some of its major tributaries, including the Gunnison, San Miguel, Dolores, and San Juan Rivers. The target area is almost entirely above 9500-foot elevation above sea level and is publicly owned.

EG&G, Inc., directs the cloud-seeding operations from its control center at Durango, Colorado. The Durango center continually appraises avalanche conditions and total snowpack depth in order to suspend seeding operations as required by safeguards included in operational design. Part of these safeguard standards require that there be no seediing of storms which forecasts indicate might be severe in nature.

The responsibility for evaluating seeding results and other fac-



U. S. Bureau of Reclamation Photo

A radiosonde balloon being launched at 5:00 a.m. near Durango, Colorado to collect weather data.

tors will be that of a separate, unbiased scientific contractor to be selected at a future date.

Studies of effects of the pilot cloud-seeding project on the environment have been contracted to the University of Colorado, Fort Lewis College, and Colorado State University. A parallel investigation by the University of Colorado Institute of Arctic and Alpine Research will determine whether powder-snow avalanches can be forecast accurately if meteorological precursors are known.

U. S. Bureau of Reclamation Photo

Three burners of a silver iodide generator being elevated into a vertical position.

XI. Findings of Fact

No findings of fact pursuant to Article VIII of the Upper Colorado River Basin Compact have been made by the Upper Colorado River Commission. No part of this Annual Report is to be construed as a finding of fact by the Commission.

XII. Acknowledgments

The Upper Colorado River Commission wishes to acknowledge the united actions of the Governors of Colorado, New Mexico, Utah and Wyoming on the fundamental issues involved in the development of the water and land resources of the Upper Colorado River Basin and for their interest in and support of the Upper Colorado River Commission.

The Commission especially wishes to give recognition to the difficult and able work of the members of the United States Congress from the Upper Division States of the Colorado River Basin and to acknowledge with appreciation the assistance it has received from agencies of the Executive Branch of the Federal Government: the Department of the Interior, Bureau of Reclamation, Geological Survey, Bureau of Indian Affairs, and the Department of Agriculture.

Officers and personnel of many state agencies having their primary interests in various phases of water resources have also aided materially with cooperative efforts and information.

Appendices

APPENDIX A

Report of Auditor

REPORT OF EXAMINATION

Upper Colorado River Commission

SALT LAKE CITY, UTAH

June 30, 1971

McNULTY, CHADWICK & STEINKIRCHNER
CERTIFIED PUBLIC ACCOUNTANTS
200 NORTH SIXTH STREET
GRAND JUNCTION, COLORADO
81501

August 13, 1971

Upper Colorado River Commission
Salt Lake City,
Utah

Gentlemen:

We have examined the balance sheets of the General Fund and the Property and Equipment Fund of the Upper Colorado River Commission as of June 30, 1971 and the related Statement of Revenue and Expense — General Fund for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheets and statement of revenue and expense present fairly the financial position of the Upper Colorado River Commission at June 30, 1971 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

McNULTY, CHADWICK & STEINKIRCHNER
Certified Public Accountants

BALANCE SHEET — GENERAL FUND

UPPER COLORADO RIVER COMMISSION

June 30, 1971

ASSETS

CASH		
Office cash fund		$ 25.00
Cash on deposit with First Security Bank of Utah, N.A:		
Demand deposit	$ 14,041.66	
Time certificates	99,000.00	113,041.66
OTHER ASSETS		
Returnable deposit—United Air Lines	425.00	
Pension trust insurance premiums to be withheld from employees	329.04	754.04
PREPAID EXPENSE		
Unexpired insurance premiums	285.52	
Prepaid pension trust insurance premiums	2,819.00	
Prepaid office expense	805.37	3,909.89
TOTAL ASSETS		$117,730.59

LIABILITIES, RESERVES AND FUND BALANCE

ACCOUNTS PAYABLE		
For supplies and expenses		$ 613.94
RESERVE		
For fiscal year 1972 assessments received in advance		12,375.00
UNAPPROPRIATED FUND BALANCE		
Balance July 1, 1970	$ 85,497.68	
Add excess of revenue over expenses for fiscal year ended June 30, 1971	29,243.97	
	114,741.65	
Less appropriation for fiscal year ended June 30, 1971	10,000.00	
Balance June 30, 1971		104,741.65
TOTAL LIABILITIES, RESERVES AND FUND BALANCE		$117,730.59

Note — The accompanying Notes to Financial Statements — General Fund are an integral part of this statement.

BALANCE SHEET — PROPERTY AND EQUIPMENT FUND

UPPER COLORADO RIVER COMMISSION

June 30, 1971

ASSETS

PROPERTY AND EQUIPMENT — at cost	
Land and land impovements	$ 26,366.00
Building	47,627.24
Furniture and fixtures	19,032.23
Library	5,218.15
Automobile	4,820.70
Engineering equipment	3,409.07
Motion picture film — at nominal value	3.00
Upper Colorado River Basin relief model	5,937.77
TOTAL ASSETS	$112,414.16

FUND BALANCE

INVESTMENT IN PROPERTY AND EQUIPMENT		
Balance July 1, 1970		$110,944.80
Transactions for the fiscal year ended June 30, 1971:		
Additions:		
Capital outlay expenditures — General Fund	$1,694.36	
Retirements:		
Remove excess of book cost over trade-in allowance on book copier machine	225.00	
NET INCREASE IN FUND BALANCE		1,469.36
FUND BALANCE JUNE 30, 1971		$112,414.16

Note — The accompanying Notes to Financial Statements — General Fund are an integral part of this statement.

NOTES TO FINANCIAL STATEMENTS — GENERAL FUND

UPPER COLORADO RIVER COMMISSION

June 30, 1971

Note 1 — At June 30, 1971, unrecorded liability of the Commission to its full time employees for accrued annual leave amounted to $5,619.93. According to Commission policy (effective July 1, 1960), each employee is expected to take annual leave of 15 days each calendar year during which period of time regular salary payments are continued. Employees may accumulate a maximum of 30 days annual leave.

Note 2 — The Commission created the Upper Colorado River Commission Pension Trust effective October 1, 1965. The purpose of this trust is to purchase insurance policies which will provide retirement income and life insurance for qualified employees of the Commission. The Commission is required to pay the premiums on the policies one year in advance, in October of each year, and amounts equivalent to 3% of the base pay is withheld from the pay checks of the participating employees during the ensuing twelve month period to cover the employee's share of the premium cost.

Note 3 — In June 1971, a representative of the United States Department of Health, Education, and Welfare made an audit of Social Security coverage operations of the Commission for the calendar year 1970. The auditor noted in his report that Section (B)(5) of the agreement dated October 1, 1951, between the Commission and the Secretary of Health, Education, and Welfare extending Social Security coverage to employees of the Commission excluded coverage of part-time employees. The Commission has, however, followed the practice of including all such employees in its Social Security contribution reports. Therefore, at the suggestion of the Director, Bureau of Retirement and Survivors Insurance, a modification of the original agreement to provide an extension of Social Security coverage to part-time Commission employees has been adopted by the Commission and is presently awaiting approval by a representative of the United States Department concerned.

STATEMENT OF REVENUE AND EXPENSE — GENERAL FUND

UPPER COLORADO RIVER COMMISSION

For the fiscal year ended June 30, 1971

	Budget	Actual	Actual Over (Under) Budget
REVENUE			
Assessments	$110,000.00	$110,000.00	$ —0—
Interest earned on time deposit	—0—	6,736.25	6,736.25
Appropriation from fund balance	10,000.00	10,000.00	—0—
TOTAL REVENUE	120,000.00	126,736.25	6,736.25
EXPENSE			
Personal services:			
Administrative salaries	29,600.00	29,580.00	(20.00)
Engineering salaries	13,200.00	3,822.87	(9,377.13)
Attorney's salary	17,300.00	17,280.00	(20.00)
Clerical salaries	3,100.00	3,089.75	(10.25)
Janitor	1,500.00	1,272.00	(228.00)
FICA Tax	1,900.00	1,371.80	(528.20)
Pension Fund	17,000.00	12,539.64	(4,460.36)
	83,600.00	68,956.06	(14,643.94)
Current expenses:			
Reporting	500.00	431.50	(68.50)
Telephone and telegrams	3,000.00	2,434.94	(565.06)
Office supplies and postage	3,700.00	2,785.27	(914.73)
Insurance and bonds	1,100.00	1,102.64	2.64
Accounting	1,500.00	980.00	(520.00)
Secretarial service	400.00	30.00	(370.00)
Engineering supplies & services	500.00	8.93	(491.07)
Printing	2,600.00	2,090.75	(509.25)
Library supplies and expense	625.00	573.20	(51.80)
Meeting expense	400.00	229.11	(170.89)
Utilities	1,300.00	1,134.82	(165.18)
Building repair & maintenance	1,500.00	1,458.77	(41,23)
Miscellaneous	675.00	654.34	(20.66)
	17,800.00	13,914.27	(3,885.73)
Capital outlay	2,600.00	1,694.36	(905.64)
Education and information	4,000.00	3,968.47	(31.53)
Travel	12,000.00	8,959.12	(3,040.88)
	18,600.00	14,621.95	(3,978.05)
TOTAL EXPENSE	120,000.00	97,492.28	(22,507.72)
EXCESS OF REVENUE OVER EXPENSE	$ —0—	$ 29,243.97	$ 29,243.97

Note — The accompanying Notes to Financial Statements — General Fund are an integral part of this statement.

Supplementary Data

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS — GENERAL FUND

UPPER COLORADO RIVER COMMISSION

For the fiscal year ended June 30, 1971

Balance of cash and demand deposit at July 1, 1970		$ 92,238.97
Cash receipts:		
Assessments for fiscal year 1971	$97,625.00	
Assessments for fiscal year 1972	12,375.00	
Interest earned on time deposit	6,736.25	
Insurance premium refunds	237.15	116,973.40
		209,212.37
Cash disbursements:		
Personal services	68,243.72	
Current expenses	13,453.46	
Capital outlay	1,711.36	
Education and information	3,668.47	
Travel	9,068.70	96,145.71
Balance of cash and demand deposit at June 30, 1971		$113,066.66

Note — The accompanying Notes to Financial Statements — General Fund are an integral part of this statement.

INSURANCE COVERAGE

UPPER COLORADO RIVER COMMISSION

June 30, 1971

		Coverage
	Type	Amount (in dollars)
Treasurer	Fidelity bond	$ 40,000
Assistant Treasurer	Fidelity bond	$ 40,000
Automobile	Comprehensive	Actual cash value
	Liability:	
	Each person	$300,000
	Each accident	$500,000
	Property damage	$ 50,000
	Medical	$ 5,000
	Collision and upset	$100 deductible
	Unisured motorists	10/20,000
Employees	Workmen's compensation	Statutory
Office contents	Fire and comprehensive	$ 50,000
Office premises	Liability	$300,000
Building	Special multi-peril	$ 60,000-A

Note A — 100% co-insurance clause

Note — The accompanying Notes to Financial Statements — General Fund are an integral part of this statement.

APPENDIX B

BUDGET

Fiscal year ending June 30, 1973

UPPER COLORADO RIVER COMMISSION

BUDGET

Fiscal Year Ending June 30, 1973

PERSONAL SERVICES		
Administrative Salaries (including Administrative Secretary)	$31,100	
Legal	18,150	
Engineering	18,150	
Clerical - Secretary	3,200*	
Janitor	1,500	
Pension Trust	17,000	
Social Security	2,100	
		$ 91,200
*Part-Time		
TRAVEL		$ 13,000
CURRENT EXPENSE		
(including Administrative Secretary)	$31,100	
Telephone and telegraph	3,050	
Insurance and bond premiums	1,200	
Printing	2,700	
Secretarial Services	400	
Engineering Supplies and Services	500	
Office Supplies and Postage	3,600	
Library and Miscellaneous	1,250	
Meeting expense	400	
Utilities	1,350	
Building Repair and Maintenance	600	
		$ 17,100
CAPITAL OUTLAY		$ 1,700
EDUCATION AND INFORMATION		$ 1,000
TOTAL ESTIMATED EXPENSE Fiscal Year July 1, 1972 through June 30, 1973		$124,000
To be funded from surplus		$ 14,000
Total Assessments for Fiscal Year 1973		$110,000

APPENDIX C

RESOLUTION

Adopted by the Upper Colorado River Commission at an Adjourned Regular Meeting in Vernal, Utah on August 8, 1962 favoring a study of measures for the reduction of salinity of the Colorado River water delivered for use in the Republic of Mexico.

WHEREAS, the Congress of the United States is presently considering appropriations bills which would provide money to study measures for the reduction of the salinity of Colorado River water delivered for use in Mexico; and,

WHEREAS, this Commission is informed that the provisions of the bill being considered would place certain restrictions on the extent of the study; and,

WHEREAS, information available to this Commission suggests that an unrestricted study might contribute to such salinity alleviation, without detriment to the States of the Colorado River Basin; and,

WHEREAS, the States of the Upper Colorado River Basin recognize no obligation to anyone pertaining to the quality of water flowing in the Colorado River, nevertheless, this Commission believes that the United States, in a spirit of friendly relations with the Republic of Mexico, should explore fully any and all measures for the reduction of the salinity of water flowing into Mexico, so long as such exploration does not contemplate any extension of the rights, duties and obligations expressly set forth in the Mexican Treaty of 1944:

NOW, THEREFORE, BE IT RESOLVED that in the event Congressional appropriations are made for this purpose, the Upper Colorado River Commission does hereby favor a study of any and all measures for the reduction of the salinity of Colorado River waters delivered for use in the Republic of Mexico; and,

BE IT FURTHER RESOLVED that the Executive Secretary be directed to transmit copies of this resolution to the Chairmen and Members of the Senate and House Appropriations Committees, to the Congressional Representatives of the Upper Colorado River Basin States, and to the Secretary of the Interior.

RESOLUTION

by

UPPER COLORADO RIVER COMMISSION

Re: Water Quality Criteria for Colorado River System

WHEREAS, the Federal Water Pollution Control Administration has proposed that quantitative criteria for total dissolved solids be set at various points in the Colorado River system based on an upper limit of 1000 mg/l at Imperial Dam; and

WHEREAS, the concentration of dissolved solids at Imperial Dam in recent years has exceeded 1000 mg/l; and

WHEREAS, the Colorado River Compact of 1922 allocated the beneficial consumptive use of 7.5 million acre feet of water annually to the Upper Colorado River Basin; and

WHEREAS, the beneficial consumptive use of water in the Upper Colorado River Basin currently is less than 3.0 million acre feet annually; and

WHEREAS, consumptive use of water for irrigation, municipal, industrial or other purposes inevitably causes an increase in the concentration of dissolved solids by consuming a part of the water diverted from the stream and leaving all of the salts diverted in the remainder; also an increase in concentration of dissolved solids results from the addition of some dissolved solids not reasonably and economically removable; and

WHEREAS, the information currently available is inadequate to project the concentration of dissolved solids at Imperial Dam taking into consideration the reasonable use of water in the Upper Basin under full development within the limits of the Colorado River Compact along with good water management practices including possible measures to control natural sources of saline water; and

WHEREAS, the Department of Health, Education and Welfare and subsequently the Federal Water Pollution Control Administration have had an investigation known as the Colorado River Basin Water Quality Control Project underway for seven years; and

WHEREAS, the Bureau of Reclamation under Public Laws 84-485, 87-483 and 87-590 has underway an investigation designed to project the quality of the water of the Colorado River system under full development; and

WHEREAS, representatives of the seven states of the Colo-

rado River Basin, at a meeting in Denver on July 27, 1967, agreed to continue studies of the salinity of the Colorado River system and to attempt to agree upon numerical criteria for dissolved solids to be established at selected points on the system;

NOW, THEREFORE, BE IT RESOLVED that water quality criteria on the Colorado River should not preclude or interfere with the reasonable use of water in the Upper Basin within the terms of the Colorado River Compact; and

BE IT FURTHER RESOLVED that quantitative criteria for dissolved solids in the waters of the Colorado River system should not be proposed or adopted by the States or the Secretary of the Interior until the studies currently being made by Department of the Interior agencies have been completed; and

BE IT FURTHER RESOLVED that the Secretary of the Interior be commended for his recent order to the Federal Water Pollution Control Administration and the Bureau of Reclamation to accelerate studies and reports on the salinity of the waters of the Colorado River system; and

BE IT FURTHER RESOLVED that the Secretary of the Interior be urged to make the Department of the Interior agency reports available to the States at the earliest possible date so that these reports may be considered and utilized in the determination of quantitative standards for the waters of the Colorado River system to be unanimously proposed by the States of the Colorado River Basin pursuant to the Water Quality Act of 1965; and

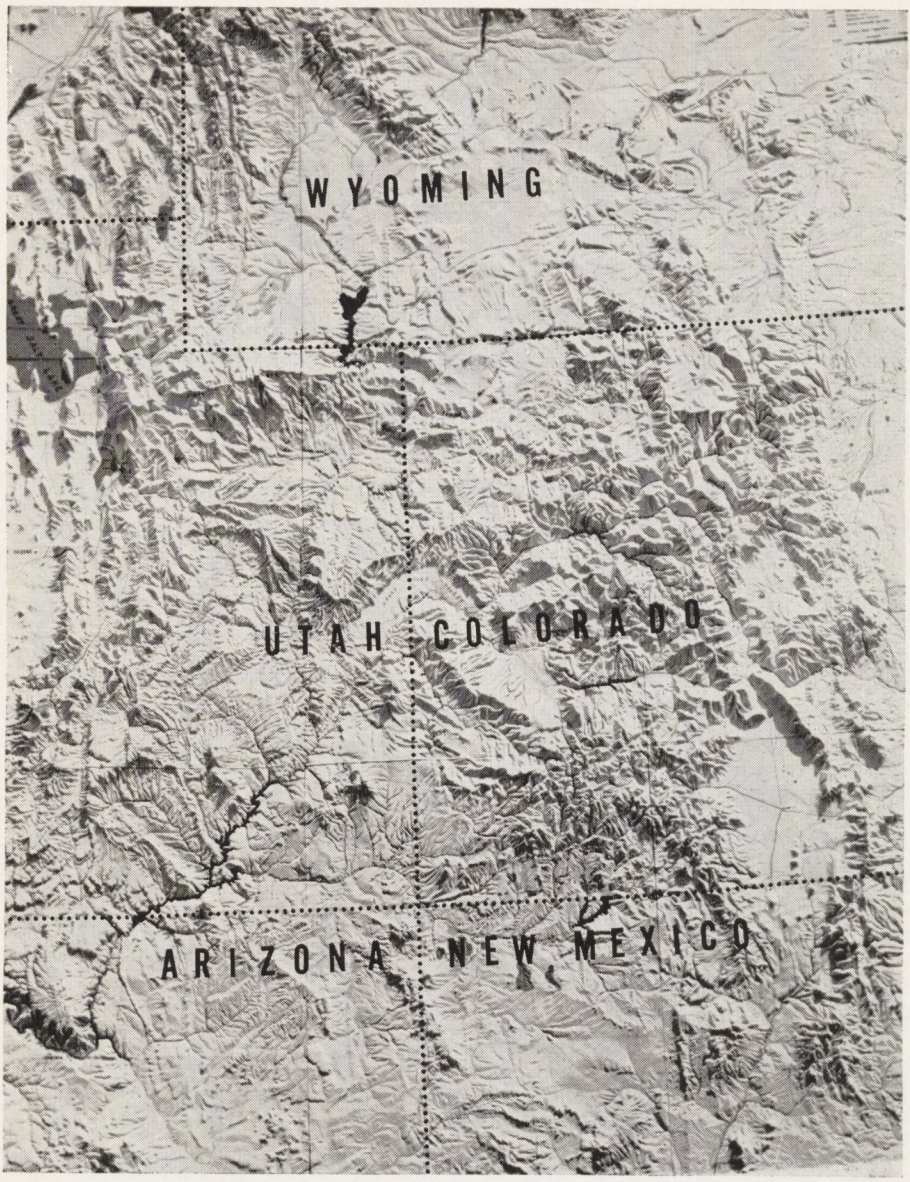
BE IT FURTHER RESOLVED that copies of this resolution be transmitted to the Secretary of the Interior and the Governors of each of the seven Colorado River Basin States.

CERTIFICATE

I, IVAL V. GOSLIN, Executive Director of the Upper Colorado River Commission, do hereby certify that the above Resolution was unanimously adopted by the Upper Colorado River Commission at an Adjourned Regular Meeting and Annual Meeting held at Moran, Wyoming on September 21, 1967.

WITNESS my hand this 22nd day of September, 1967.

/s/ Ival V. Goslin
Ival V. Goslin
Executive Director



The relief model of the Upper Colorado River Basin, pictured above, was constructed by the Upper Colorado River Commission in cooperation with the Babson Institute of Business Administration. This model shows the topographic features of the area and indicates location of major units of the Colorado River Storage Project and Participating Projects. It is used by the Commission in work connected with administration of Upper Basin activities and is available for display at conventions and other public events.

UPPER COLORADO RIVER COMMISSION

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