FORTY-EIGHTH ANNUAL REPORT

OF THE

Upper Colorado River Commission

SALT LAKE CITY, UTAH

SEPTEMBER 30, 1996

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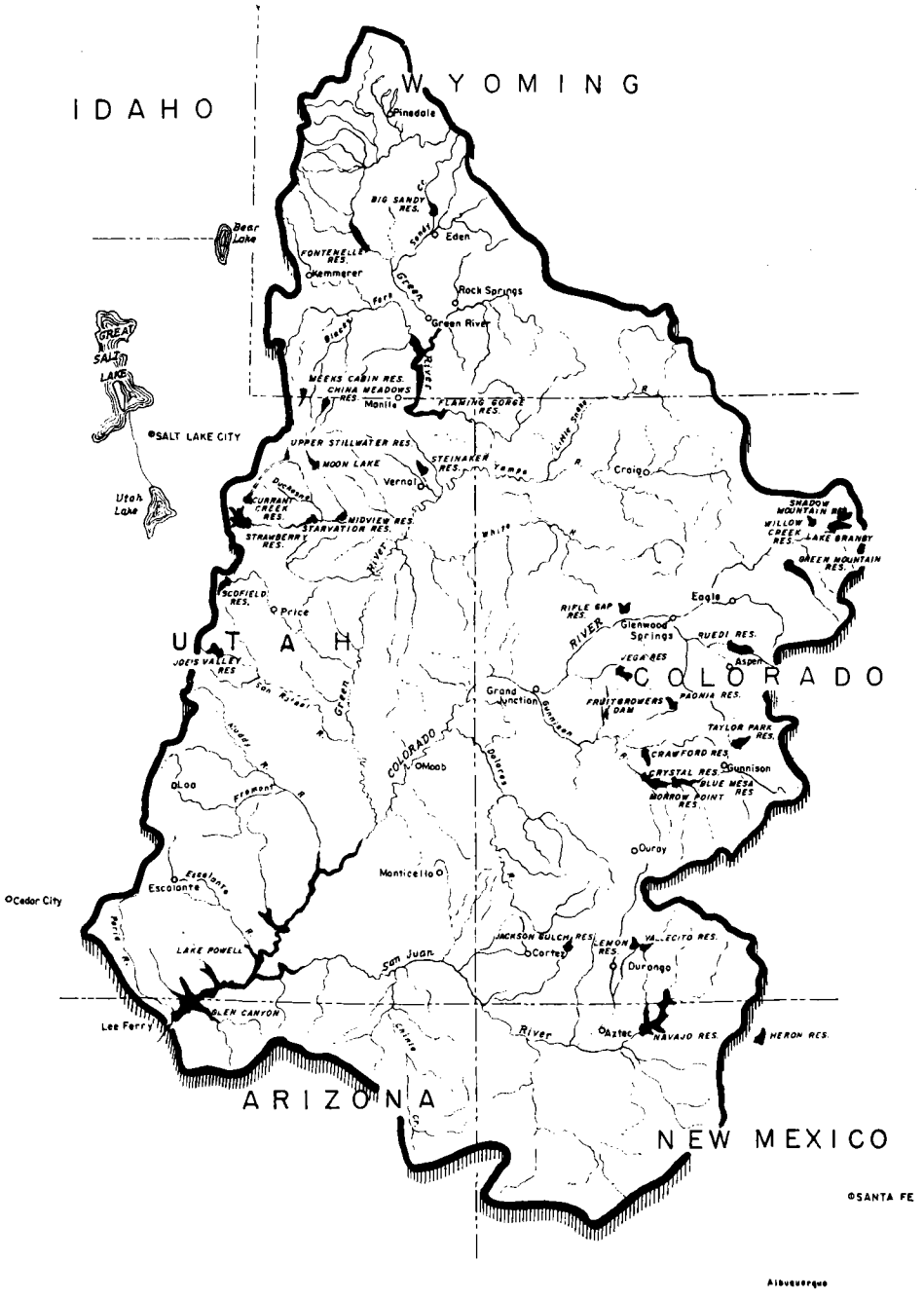

UPPER COLORADO RIVER BASIN

UPPER COLORADO RIVER
COMMISSION

25 0 25 50
SCALE OF MILES

UPPER COLORADO
RIVER COMMISSION
355 South 400 East • Salt Lake City • Utah 84111 • 801-531-1150 • FAX 801-531-9705

Mr. President:

The Forty-Eighth 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 for fiscal year 1998 (July 1, 1997 - June 30, 1998) 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,

Wayne E. Cook
Executive Director

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

Enclosure

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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."

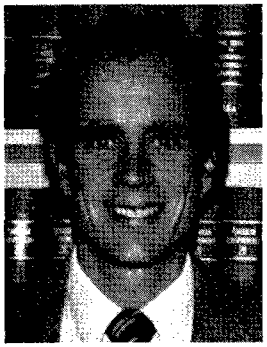
Article VIII(1) of the By-Laws of the Commission specifies that "the Commission shall make and transmit annually on or before April 1 to the Governors of the states signatory to the Upper Colorado River Basin Compact and to the President of the United States a report covering the activities of the Commission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

This Forty-Eighth 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:

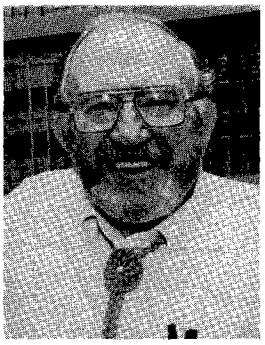
- Membership of the Commission, its Committees, Advisers, and Staff;
- Roster of meetings of the Commission;
- Brief discussion of the activities of the Commission;
- Engineering and hydrologic data;
- Pertinent legal information;
- Information pertaining to congressional legislation;
- Map of the Upper Colorado River Basin;
- Status of the Storage Units and participating projects of the Colorado River Storage Project;
- Appendices containing:
  - Fiscal data, such as: budget, balance sheet, statements of revenue and expense.
  - Transmountain diversions, etc.

COMMISSION

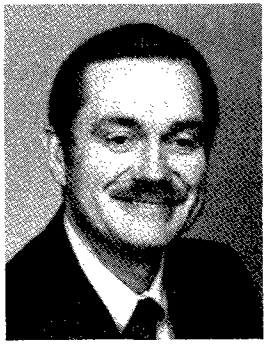


James S. Lochhead
Commissioner for
Colorado

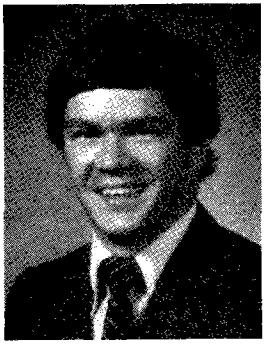
Philip B. Mutz
Commissioner for
New Mexico



Frank E. (Sam) Maynes
Chairman
Commissioner for
United States



D. Larry Anderson
Commissioner for
Utah



Gordon W. Fassett
Commissioner for
Wyoming

ALTERNATE COMMISSIONERS

Daries C. (Chuck) Lile	State of Colorado
William J. Miller	State of New Mexico
Dallin W. Jensen	State of Utah
Dan S. Budd	State of Wyoming
Aaron H. McGinnis	State of Wyoming

OFFICERS OF THE COMMISSION

Chairman	Frank E. (Sam) Maynes
Vice Chairman	James S. Lochhead
Secretary	Wayne E. Cook
Treasurer	Ronald A. Schulthies
Assistant Treasurer	Roger Dean

STAFF

Executive Director	Wayne E. Cook
Assistant to the Executive Director and General Counsel	Jane Bird
Chief Engineer	Clinton D. Stevens*
Staff Engineer	Anne M. Englert**
Administrative Secretary	P. J. Magura

*Resigned 5/15/96
**Employed 8/19/96

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 the By-Laws):

Engineering Committee:

Barry C. Saunders, Chairman*
William J. Miller, Chairman**
Eugene I. Jencsok
David H. Merritt
Harold (Hal) Simpson
Jay C. Groseclose
Robert L. Morgan
Robert King
John W. Shields
Eric Kuhn

Legal Committee:

Jennifer L. Gimbel, Chairman
Gale Norton
Daries C. (Chuck) Lile
David C. Hallford, Alternate
Peter White
Dallin W. Jensen
Michael M. Quealy
Larry M. Donovan

Budget Committee:

Gordon W. Fassett, Chairman
Daries C. (Chuck) Lile
Philip B. Mutz
D. Larry Anderson

* Retired
**Appointed 7/18/96

ADVISERS TO COMMISSIONERS

The following individuals serve as advisers to their respective Commissioner:

COLORADO

Legal:

Daries C. (Chuck) Lile, Director
Colorado Water Conservation Board
Denver, Colorado

Gale Norton
Attorney General
State of Colorado
Denver, Colorado

David C. Hallford
General Counsel
Colorado River Water
Conservation District
Glenwood Springs, Colorado

Engineering:

Daries C. Lile, Director
Colorado Water Conservation Board
Denver, Colorado

Eugene I. Jencsok
Colorado Water Conservation Board
Denver, Colorado

Harold (Hal) Simpson
State Engineer
Denver, Colorado

David H. Merritt
Colorado River Water
Conservation District
Glenwood Springs, Colorado

Eric Kuhn
Colorado River Water
Conservation District
Glenwood Springs, Colorado

NEW MEXICO

Legal:

Peter White
General Counsel
New Mexico Interstate Stream
Commission
Santa Fe, New Mexico

Engineering:

William J. Miller
Interstate Stream Engineer
New Mexico Interstate
Stream Commission
Santa Fe, New Mexico

Jay C. Groseclose
New Mexico Interstate
Stream Commission
Santa Fe, New Mexico

UTAH

Legal:

Dallin W. Jensen
Attorney at Law
Salt Lake City, Utah

Michael M. Quealy
Assistant Attorney General
Salt Lake City, Utah

Engineering:

Barry C. Saunders
Associate Director
Division of Water Resources
Salt Lake City, Utah

Robert L. Morgan
State Engineer
Division of Water Rights
Salt Lake City, Utah

Robert King, Chief
Division of Water Resources
Salt Lake City, Utah

General Advisers:

Don A. Christiansen, Manager
Central Utah Water Conservancy
District
Orem, Utah

David Rasmussen
Manager
Uintah Water
Conservancy District
Vernal, Utah

WYOMING

Legal:

Larry M. Donovan
Assistant Attorney General
Cheyenne, Wyoming

Tom Davidson, Deputy Attorney General
Water Resources Division
Cheyenne, Wyoming

Engineering:

John W. Shields
Interstate Streams
Engineer
Cheyenne, Wyoming

General Adviser:

George L. Christopulos
Cheyenne, Wyoming

MEETINGS OF THE COMMISSION

During the Water Year ending September 30, 1996 the Commission met two times as follows:

Meeting No. 231	March 18, 1996	Regular Meeting Salt Lake City, Utah
Meeting No. 232	July 18, 1996	Adjourned Regular Meeting Denver, Colorado

ACTIVITIES OF THE COMMISSION

Within the scope and limitations of Article I(a) of the Upper Colorado River Basin Compact and under the powers conferred upon the Commission by Article VIII(d), the principal activities of the Commission have consisted of: (A) research and studies of an engineering and hydrologic nature of various facets of the water resources of the Colorado River Basin especially as related to operation of the Colorado River reservoirs; (B) collection and compilation of documents for a legal library relating to the utilization of waters of the Colorado River System for domestic, industrial and agricultural purposes, and the generation of hydroelectric power; (C) legal analyses of associated laws, court decisions, reports and problems; (D) participation in activities and providing comments on proposals that would increase the beneficial consumptive uses in the Upper Basin, including environmental, fish and wildlife, endangered species and water quality activities to the extent that they might impair Upper Basin development; (E) cooperation with water resources agencies of the Colorado River Basin States on water and water-related problems; (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 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 the Committees of the Congress.

A. ENGINEERING -- HYDROLOGY

1. Colorado River Salinity Program

The Upper Colorado River Commission has continued its interest and involvement in the Colorado River Basin salinity problem. The Commission staff has worked with representatives of the Commission's member States in coordinating and correlating activities with other State and Federal agencies, particularly the Colorado River Basin Salinity Control Forum, which is composed of representatives from the seven Colorado River Basin States. The Forum has developed water quality standards and a plan of implementation to meet the Environmental Protection Agency Regulation (40 CFR Part 120, Water Quality Standards--Colorado River System: Salinity Control Policy and Standards Procedures).

Section 303 of the Clean Water Act requires that water quality standards be reviewed from time to time and at least once during each three-year period. The Forum in 1996 reviewed the existing State-adopted and Environmental Protection Agency-approved numeric salinity criteria and found no reason to recommend changes for the three lower mainstem stations.

The values are:

	Salinity in (mg/l)
Below Hoover Dam	723
Below Parker Dam	747
Imperial Dam	879

The Forum is continuing to study salinity conditions and to develop new salinity projections. The Forum is also developing flow versus salt load relationships that will reflect present and anticipated conditions.

Salinities at each of the three lower mainstem stations for which numeric criteria have been established have decreased since 1972.

2. Forecast of Stream Flow

The April 1, 1996 forecast of inflow to Lake Powell by the National Weather Service, Department of Commerce, for April-July was estimated to be 8,900,000 acre-feet[1]. The unregulated inflow to Lake Powell for the period April-July 1996 amounted to 7,322,000 acre-feet[2], which was about 95 percent of the 30-year (1961-1990) average flow.

During the April-July 1996 period, changes in storage in Colorado River Storage Project reservoirs including Lake Powell resulted in an overall increase of 2,636,100 acre-feet, with 288,600 acre-feet of evaporation and a 253,200 acre-feet increase in bank storage[3].

Actual regulated inflow to Lake Powell for the period April-July 1996 was 6,627,000 acre-feet.

For the period October 1, 1995 through September 30, 1996, the change in reservoir storage, excluding bank storage and evaporation, at selected reservoirs above Lake Powell was as follows:

- Fontenelle decreased 36,300 acre-feet.
- Flaming Gorge decreased 124,200 acre-feet.
- Taylor Park decreased 19,200 acre-feet.
- Blue Mesa decreased 95,600 acre-feet.
- Morrow Point increased 800 acre-feet.
- Crystal decreased 800 acre-feet.
- Navajo decreased 352,800 acre-feet.

The virgin flow[4] of the Colorado River at Lee Ferry[5] for the 1996 water year amounted to 14,185,000 acre-feet[6].

---

[1] Including water to be stored upstream in other Colorado River Storage Project Reservoirs.

[2] Adjusted for upstream regulation and depletions.

[3] Includes Flaming Gorge Reservoir on the Green River.

[4] Virgin flow is the estimated flow of the stream if it were in its natural state and unaffected by the activities of man.

[5] 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 downstream from the mouth of the Paria River and about 16 miles downstream from Glen Canyon Dam.

[6] Based on provisional records subject to revision.

3. Summary of Reservoir Levels and Contents

Runoff[7] during the year ending September 30, 1996 ranged from 32.9 percent of the 83-year (1914-1996) mean at the San Juan River station near Bluff, Utah to 99.8 percent of the 83-year mean at the Colorado River station near Cisco, Utah. The volumes of runoff at these stations were 787,200 acre-feet and 5,556,800 acre-feet respectively. Runoff at the Green River station near Green River, Utah totaled 4,544,600 acre-feet, which was 98.4 percent of the 83-year mean.

Lake Powell's lowest elevation of the 1996 water year occurred on April 3, 1996 when the reservoir level was at elevation 3,671.79 feet (live content of 20,086,800 acre-feet). Lake Powell was at its highest point on July 7, 1996 at elevation 3,688.31 feet with a content of 22,494,400 acre-feet. A total of 11,431,400 acre-feet was released to the river below Glen Canyon Dam during the 1996 water year. The 1987-1996 (10-year) delivery to the Lower Basin (measured at Lee Ferry) was 91,351,000 acre-feet.

Lake Mead, on September 30, 1996, contained 21,613,800 acre-feet[8] of available storage water at elevation 1,190.84 feet. On September 30, 1996, the live storage of Lake Mead was 458,700 acre-feet greater than the storage in Lake Powell.

Table 1 on page 11 shows the Statistical Data for Principal Reservoirs in the Upper Colorado River Basin. Table 2 on page 12 provides the same information for the Lower Colorado River Basin reservoirs.

The results of the long-range reservoir operation procedures adopted by the Secretary of the Interior for Lake Powell, Flaming Gorge, Fontenelle, Navajo, and Blue Mesa reservoirs in the Upper Colorado River Basin and for Lake Mead in the Lower Basin are illustrated on pages 13 through 20 for the 1996 water year.

In water year 1996, there was no equalization of storage as dictated by Section 602(a) of Public Law 90-537. The drawdown of Lake Powell was governed by factors other than the equalization criteria.

---

[7] Adjusted for the change in storage in Colorado River Storage Project Reservoirs.

[8] Based on April 1, 1967 Capacity Table revised according to Sedimentation Survey 1963-1964.

Table 1

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN
UPPER BASIN

Colorado River Storage Project
(Total Surface Capacity)

(Units: Elevation = feet; Capacity = 1,000 acre-feet)

	Fontenelle		Flaming Gorge		Taylor Park		Blue Mesa		Morrow Point		Crystal		Navajo		Lake Powell	
	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.	Elev.	Cap.
River elevation at dam (average tailwater)	-	-	5,603	0	9,174	0	7,160	0	6,775	0	6,534	0	5,720	0	3,138	0
Dead Storage	6,408	0.56	5,740	40	-	-	7,358	111	6,808	0	6,670	8	5,775	13	3,370	1,893
Inactive Storage (minimum power pool)	-	-	5,871	273	-	-	7,393	192	7,100	75	6,700	12	5,990 [1]	673	3,490	5,890
Rated Head	6,491	234	5,946	1,102	-	-	7,438	361	7,108	80	6,740	20	-	-	3,570	11,000
Maximum Storage (without surcharge)	6,506	345	6,040	3,789	9,330	106	7,519	941	7,160	117	6,755	25	6,085	1,709	3,700	26,215

[1] The elevation for inactive storage for Navajo Reservoir is required for the Navajo Indian Irrigation Project.

Table 2

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN LOWER BASIN

(Usable Surface Capacity)

(Units: Elevation = feet; Capacity = 1,000 acre-feet)

	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

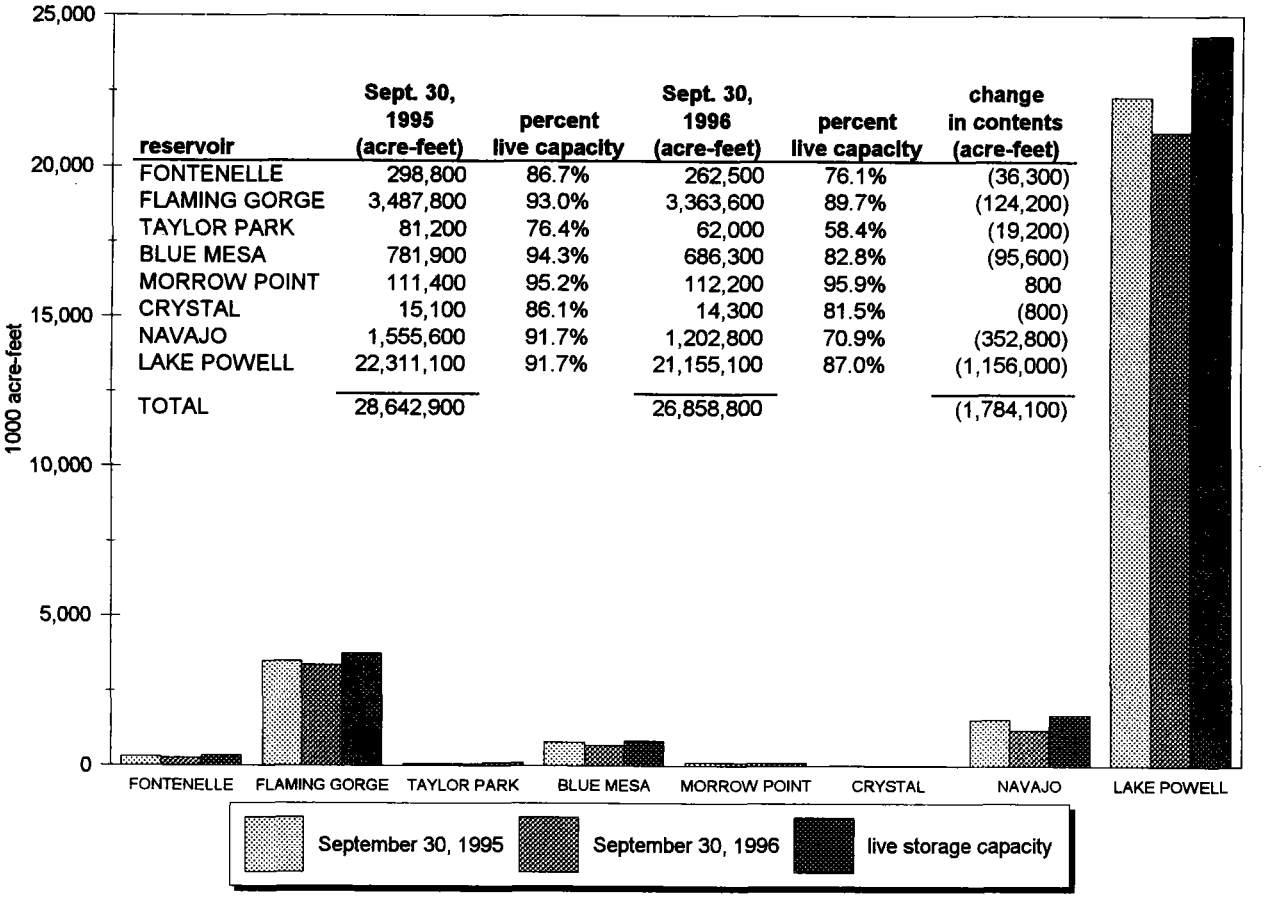
[1] The elevation for inactive storage for Lake Havasu is the contractual minimum for delivery to Metropolitan Water District's Colorado River Aqueduct.

Storage in Principal Reservoirs at the End of Water Year 1996

Upper Basin

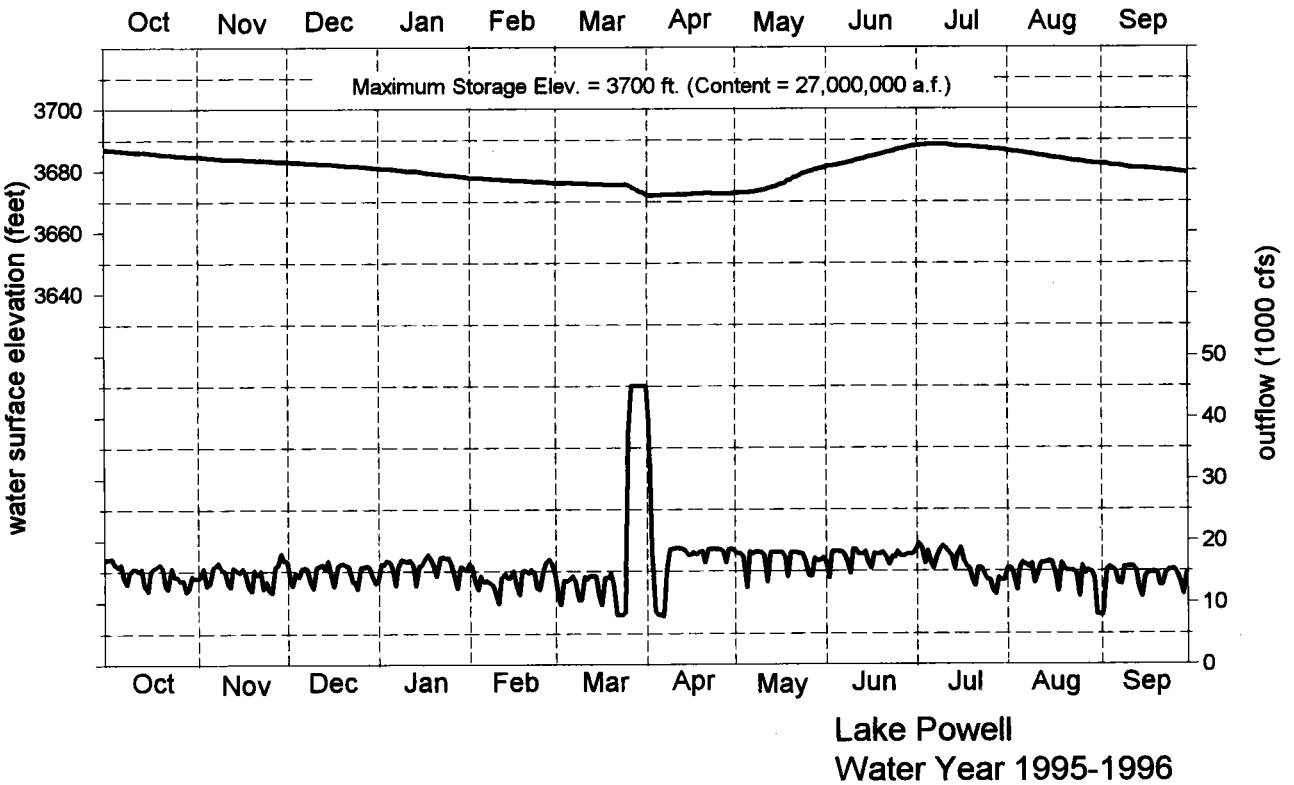
Live Storage Contents

reservoir	Sept. 30, 1995 (acre-feet)	percent live capacity	Sept. 30, 1996 (acre-feet)	percent live capacity	change in contents (acre-feet)
FONTENELLE	298,800	86.7%	262,500	76.1%	(36,300)
FLAMING GORGE	3,487,800	93.0%	3,363,600	89.7%	(124,200)
TAYLOR PARK	81,200	76.4%	62,000	58.4%	(19,200)
BLUE MESA	781,900	94.3%	686,300	82.8%	(95,600)
MORROW POINT	111,400	95.2%	112,200	95.9%	800
CRYSTAL	15,100	86.1%	14,300	81.5%	(800)
NAVAJO	1,555,600	91.7%	1,202,800	70.9%	(352,800)
LAKE POWELL	22,311,100	91.7%	21,155,100	87.0%	(1,156,000)
TOTAL	28,642,900		26,858,800		(1,784,100)



Lake Powell - Glen Canyon Dam

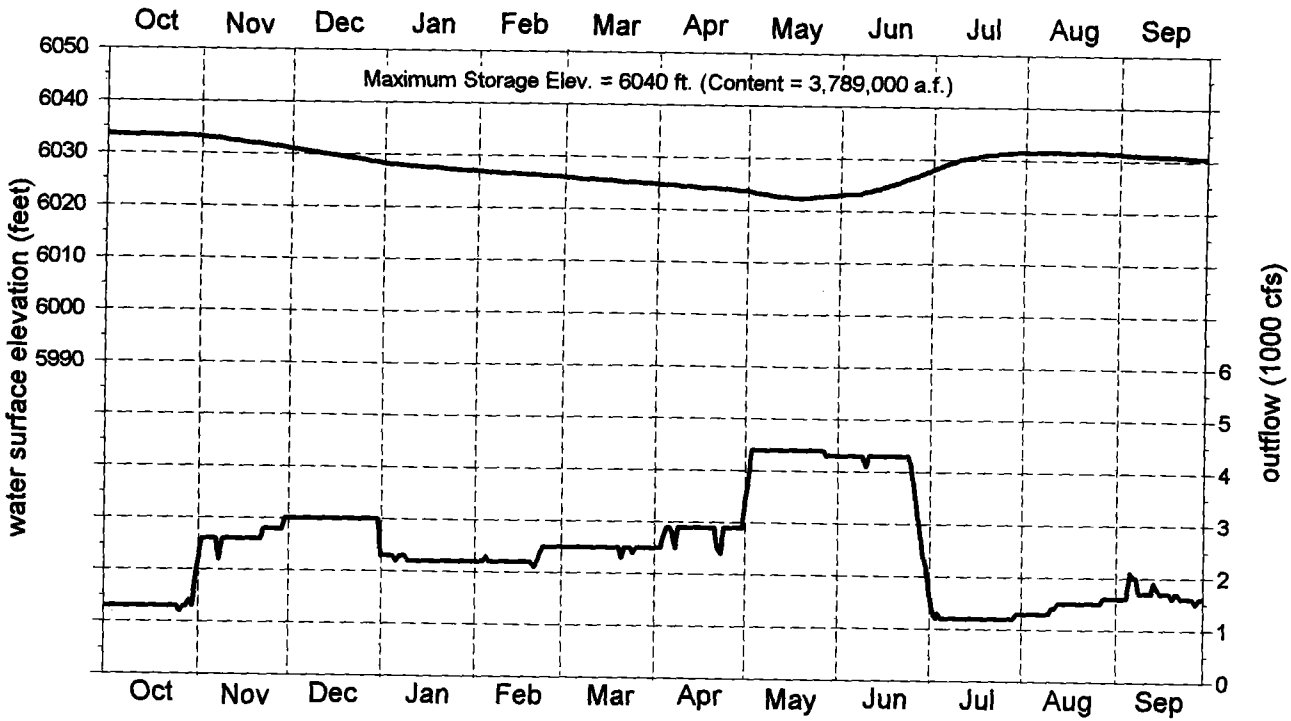
Live Storage Capacity - 24,322,000 acre-feet
Power Generation Capacity - 1,356,000 KW
Live Storage 9/30/96 - 21,155,100 acre-feet



Lake Powell
Water Year 1995-1996

Flaming Gorge

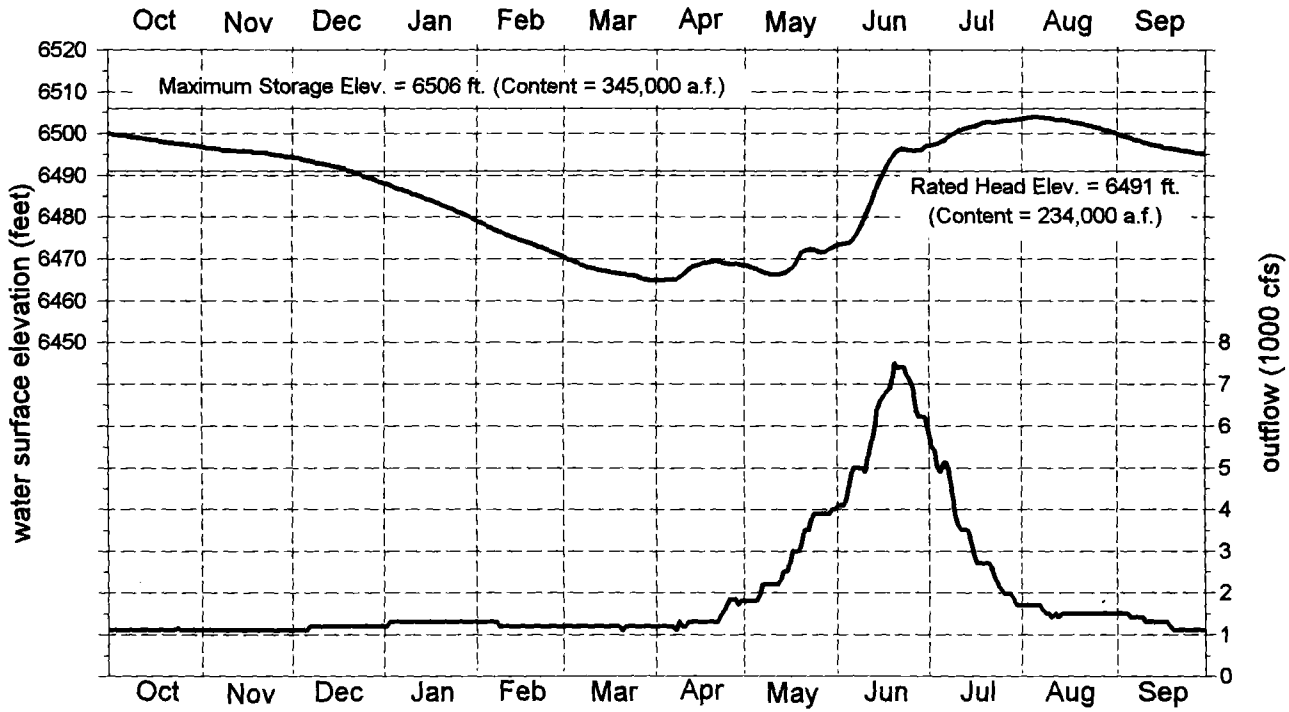
Live Storage Capacity - 3,749,000 acre-feet
Power Generation Capacity - 144,000 KW
Live Storage 9/30/96 - 3,363,600 acre-feet



Flaming Gorge Reservoir
Water Year 1995-1996

Fontenelle

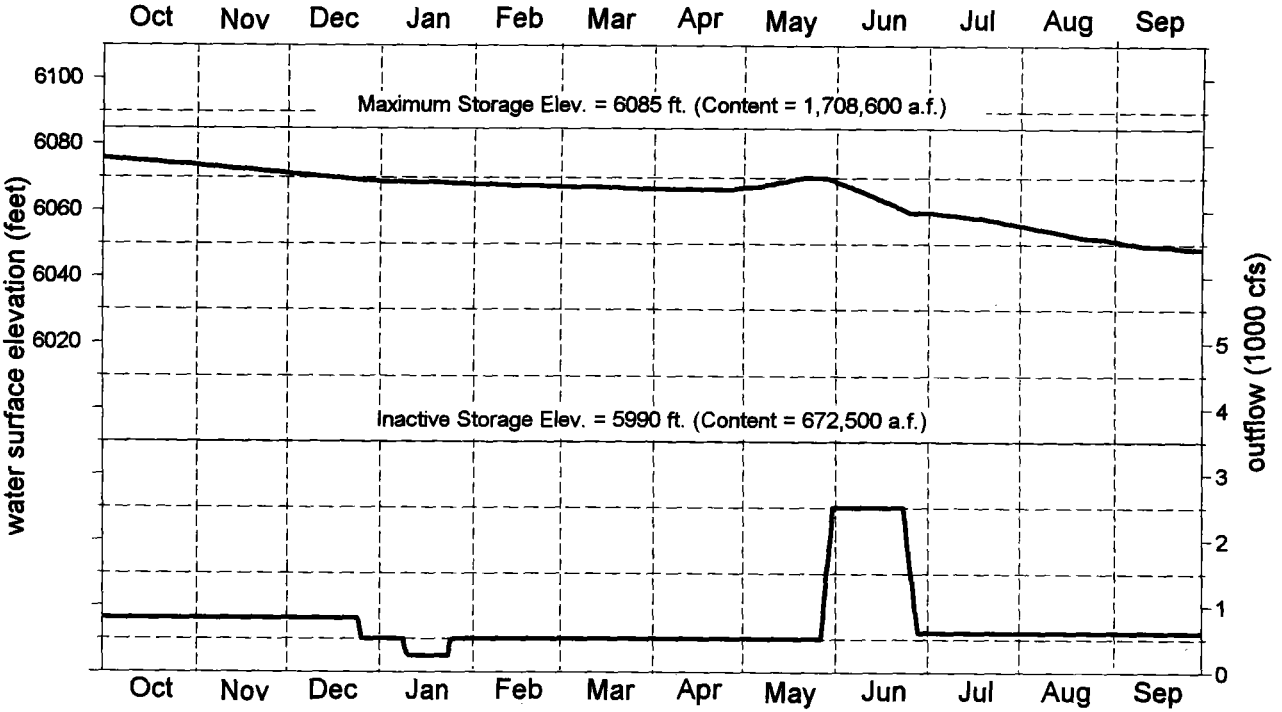
Live Storage Capacity - 344,800 acre-feet
Power Generation Capacity - 13,000 KW
Live Storage 9/30/96 - 262,500 acre-feet



Fontenelle Reservoir
Water Year 1995-1996

Navajo

Live Storage Capacity - 1,695,900 acre-feet
Power Generation Capacity - 0 KW
Live Storage 9/30/96 - 1,202,800 acre-feet



Navajo Reservoir
Water Year 1995-1996

Blue Mesa

Live Storage Capacity - 829,000 acre-feet
Power Generation Capacity - 96,000 KW
Live Storage 9/30/96 - 686,300 acre-feet

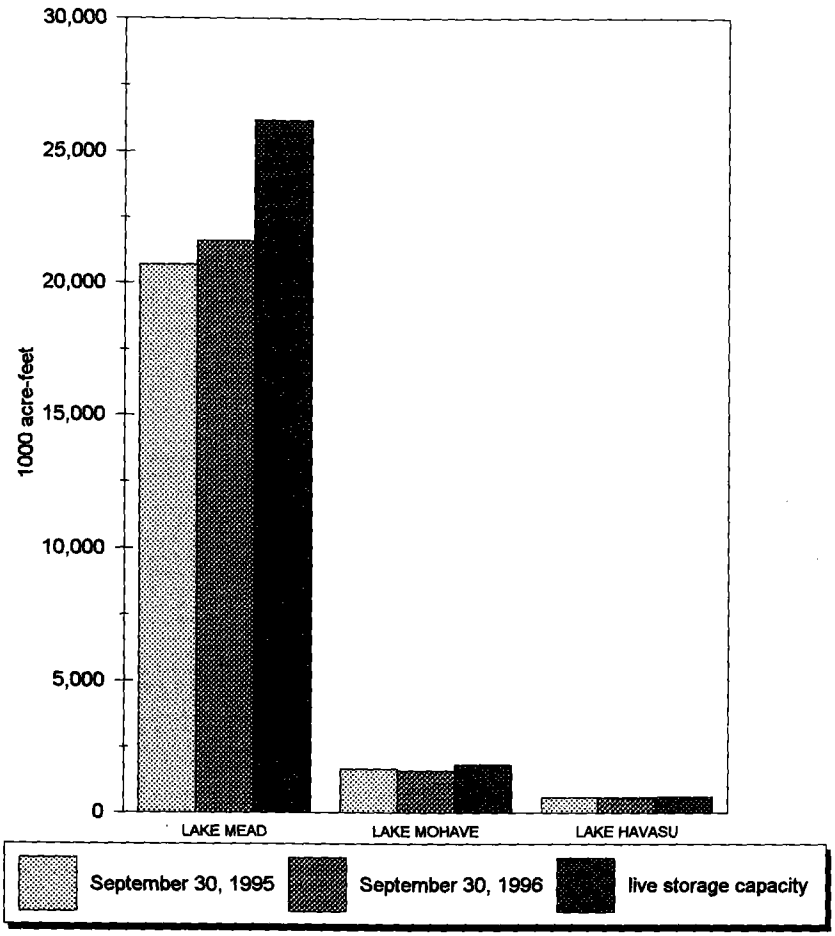
Blue Mesa Reservoir
Water Year 1995-1996

Storage in Principal Reservoirs at the End of Water Year 1996

Lower Basin

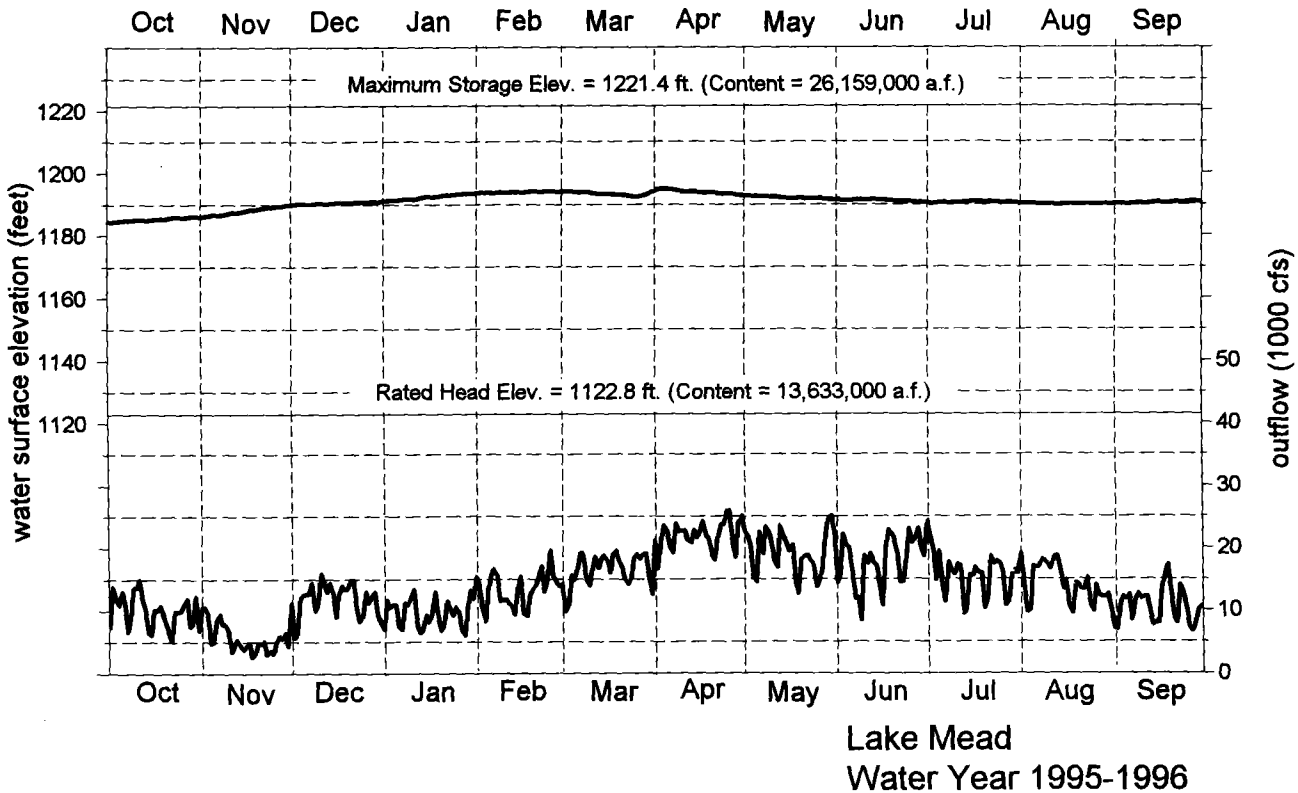
Live Storage Contents

reservoir	Sept. 30, 1995 (acre-feet)	percent live capacity	Sept. 30, 1996 (acre-feet)	percent live capacity	change in contents (acre-feet)
LAKE MEAD	20,714,000	79.2%	21,613,800	82.6%	899,800
LAKE MOHAVE	1,635,000	90.3%	1,578,000	87.2%	(57,000)
LAKE HAVASU	588,000	95.0%	597,000	96.4%	9,000
TOTAL	22,937,000		23,788,800		851,800



Lake Mead - Hoover Dam

Live Storage Capacity - 26,159,000 acre-feet
Power Generation Capacity - 1,914,000 KW
Live Storage 9/30/96 - 21,613,800 acre-feet



Lake Mead
Water Year 1995-1996

4. Flows of Colorado River

Table 3 on pages 22 and 23 shows the estimated virgin flow of the Colorado River at Lee Ferry, Arizona for each water year from 1896 through 1996. Column (4) of the table shows the average virgin flow for any given year within the period computed through water year 1996. Column (5) shows the average virgin flow for a given year within the period computed since water year 1896. Column (6) shows the average virgin flow for each progressive ten-year period beginning with the ten-year period ending on September 30, 1905. The difference between the virgin flow for a given year and the average flow over the 100-year period, 1896 through 1996, is shown in Column (7).

Article III(d) of the Colorado River Compact stipulates that "the States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in a continuing progressive series beginning with the first day of October next succeeding the ratification of this Compact." Prior to the storage of water in the Colorado River Storage Project reservoirs, which began in 1962, the flow of the river at Lee Ferry in any ten consecutive years was greatly in excess of the 75,000,000 acre-feet required by the Compact. Beginning in 1962, Colorado River Storage Project reservoirs have regulated the river above Glen Canyon Dam. Table 4, on page 24, shows the historic flow at Lee Ferry for the period 1953 through 1996. The historic flow for each progressive ten-year period from 1953 through 1996, beginning with the ten-year period ending September 30, 1962, the commencement of storage in Colorado River Storage Project reservoirs, is shown in Column (3).

In each consecutive ten-year period, the total flow equaled or exceeded the 75,000,000 acre-feet required by the Compact. The flow at Lee Ferry during the ten-year period ending September 30, 1996 was 91,350,000 acre-feet.

Table 3

ESTIMATED VIRGIN FLOW AT LEE FERRY

(million acre-feet)

(1) Years to 1996	(2) Year Ending Sept. 30	(3) Estimated Virgin Flow	(4) Average to 1996	(5) Average Since 1896	(6) Progressive 10-year Moving Average	(7) Virgin Flow Minus 100-year Average
101	1896	10.1	14.9	10.1		-4.8
100	1897	18.0	14.9	14.1		3.1
99	1898	13.8	14.9	14.0		-1.1
98	1899	15.9	14.9	14.5		1.0
97	1900	13.2	14.9	14.2		-1.7
96	1901	13.6	14.9	14.1		-1.3
95	1902	9.4	14.9	13.4		-5.5
94	1903	14.8	15.0	13.6		-0.1
93	1904	15.6	15.0	13.8		0.7
92	1905	16.0	15.0	14.0	14.0	1.1
91	1906	19.1	15.0	14.5	14.9	4.2
90	1907	23.4	14.9	15.2	15.5	8.5
89	1908	12.9	14.8	15.1	15.4	-2.0
88	1909	23.3	14.9	15.7	16.1	8.4
87	1910	14.2	14.8	15.6	16.2	-0.7
86	1911	16.0	14.8	15.6	16.5	1.1
85	1912	20.5	14.8	15.9	17.6	5.6
84	1913	14.5	14.7	15.8	17.6	-0.4
83	1914	21.2	14.7	16.1	18.1	6.3
82	1915	14.0	14.6	16.0	17.9	-0.9
81	1916	19.2	14.6	16.1	17.9	4.3
80	1917	24.0	14.6	16.5	18.0	9.1
79	1918	15.4	14.4	16.4	18.2	0.5
78	1919	12.5	14.4	16.3	17.2	-2.4
77	1920	22.0	14.5	16.5	17.9	7.1
76	1921	23.0	14.4	16.8	18.6	8.1
75	1922	18.3	14.2	16.8	18.4	3.4
74	1923	18.3	14.2	16.9	18.8	3.4
73	1924	14.2	14.1	16.8	18.1	-0.7
72	1925	13.0	14.1	16.6	18.0	-1.9
71	1926	15.9	14.1	16.6	17.7	1.0
70	1927	18.6	14.1	16.7	17.1	3.7
69	1928	17.3	14.1	16.7	17.3	2.4
68	1929	21.4	14.0	16.8	18.2	6.5
67	1930	14.9	13.9	16.8	17.5	0.0
66	1931	7.8	13.9	16.5	16.0	-7.1
65	1932	17.2	14.0	16.6	15.9	2.3
64	1933	11.4	13.9	16.4	15.2	-3.5
63	1934	5.6	14.0	16.1	14.3	-9.3
62	1935	11.6	14.1	16.0	14.2	-3.3
61	1936	13.8	14.1	16.0	14.0	-1.1
60	1937	13.7	14.2	15.9	13.5	-1.2
59	1938	17.5	14.2	16.0	13.5	2.6
58	1939	11.1	14.1	15.8	12.5	-3.8
57	1940	8.6	14.2	15.7	11.8	-6.3
56	1941	18.1	14.3	15.7	12.9	3.2
55	1942	19.1	14.2	15.8	13.1	4.2
54	1943	13.1	14.1	15.8	13.2	-1.8
53	1944	15.2	14.1	15.7	14.2	0.3
52	1945	13.4	14.1	15.7	14.4	-1.5
51	1946	10.4	14.1	15.6	14.0	-4.5
50	1947	15.5	14.2	15.6	14.2	0.6

Table 3

ESTIMATED VIRGIN FLOW AT LEE FERRY

(million acre-feet)

(1) Years to 1996	(2) Year Ending Sept. 30	(3) Estimated Virgin Flow	(4) Average to 1996	(5) Average Since 1896	(6) Progressive 10-year Moving Average	(7) Virgin Flow Minus 100-year Average
49	1948	15.6	14.2	15.6	14.0	0.7
48	1949	16.4	14.1	15.6	14.5	1.5
47	1950	12.9	14.1	15.6	15.0	-2.0
46	1951	11.6	14.1	15.5	14.3	-3.3
45	1952	20.7	14.2	15.6	14.5	5.8
44	1953	10.6	14.0	15.5	14.2	-4.3
43	1954	7.7	14.1	15.4	13.5	-7.2
42	1955	9.2	14.2	15.3	13.1	-5.7
41	1956	10.7	14.4	15.2	13.1	-4.2
40	1957	20.1	14.5	15.3	13.6	5.2
39	1958	16.5	14.3	15.3	13.6	1.6
38	1959	8.6	14.2	15.2	12.9	-6.3
37	1960	11.3	14.4	15.1	12.7	-3.6
36	1961	8.5	14.5	15.0	12.4	-6.4
35	1962	17.3	14.7	15.0	12.1	2.4
34	1963	8.4	14.6	15.0	11.8	-6.5
33	1964	10.2	14.8	14.9	12.1	-4.7
32	1965	18.9	14.9	14.9	13.1	4.0
31	1966	11.2	14.8	14.9	13.1	-3.7
30	1967	11.9	14.9	14.8	12.3	-3.0
29	1968	13.7	15.0	14.8	12.0	-1.2
28	1969	14.4	15.1	14.8	12.6	-0.5
27	1970	15.4	15.1	14.8	13.0	0.5
26	1971	15.1	15.1	14.8	13.7	0.2
25	1972	12.2	15.1	14.8	13.1	-2.7
24	1973	19.4	15.2	14.9	14.2	4.5
23	1974	13.3	15.0	14.8	14.6	-1.6
22	1975	16.6	15.1	14.9	14.3	1.7
21	1976	11.6	15.0	14.8	14.4	-3.3
20	1977	5.8	15.2	14.7	13.8	-9.1
19	1978	15.2	15.7	14.7	13.9	0.3
18	1979	17.9	15.7	14.8	14.3	3.0
17	1980	17.5	15.6	14.8	14.5	2.6
16	1981	8.2	15.4	14.7	13.8	-6.7
15	1982	16.2	15.9	14.7	14.2	1.3
14	1983	24.0	15.9	14.8	14.6	9.1
13	1984	24.5	15.3	14.9	15.8	9.6
12	1985	20.8	14.5	15.0	16.2	5.9
11	1986	21.9	13.9	15.1	17.2	7.0
10	1987	16.9	13.1	15.1	18.3	2.0
9	1988	11.6	12.7	15.1	18.0	-3.3
8	1989	9.2	12.9	15.0	17.1	-5.7
7	1990	8.0	13.4	14.9	16.1	-6.9
6	1991	12.1	14.3	14.9	16.5	-2.8
5	1992	10.3	14.7	14.9	15.9	-4.6
4	1993	18.0	15.8	14.9	15.3	3.1
3	1994	10.3	15.1	14.8	13.9	-4.6
2	1995	20.8	17.5	14.9	13.9	5.9
1	1996	14.2	14.2	14.9	13.1	-0.7
Maximum		24.5			18.8	9.6
Minimum		5.6			11.8	-9.3

Table 4

HISTORIC FLOW AT LEE FERRY

1953 - 1996

(1,000 acre-feet)

(1) Water Year Ending September 30	(2) Historic Flow	(3) Progressive 10-year Total
1953	8,805	
1954	6,116	
1955	7,307	
1956	8,750	
1957	17,340	
1958	14,260	
1959	6,756	
1960	9,192	
1961	6,674	
1962	14,790	99,990
1963	2,520	93,705
1964	2,427	90,016
1965	10,835	93,544
1966	7,870	92,664
1967	7,824	83,148
1968	8,358	77,246
1969	8,850	79,340
1970	8,688	78,836
1971	8,607	80,769
1972	9,330	75,309
1973	10,141	82,930
1974	8,277	88,780
1975	9,274	87,219
1976	8,494	87,843
1977	8,269	88,288
1978	8,369	88,299
1979	8,333	87,782
1980	10,950	90,044
1981	8,316	89,753
1982	8,323	88,746
1983	17,520	96,125
1984	20,518	108,366
1985	19,109	118,201
1986	16,866	126,573
1987	13,450	131,754
1988	8,231	131,616
1989	7,995	131,278
1990	7,952	128,280
1991	8,111	128,075
1992	8,002	127,754
1993	8,137	118,371
1994	8,306	106,159
1995	9,505	96,555
1996	11,662	91,350

Note: Storage in Flaming Gorge and Navajo Reservoirs began in 1962.
Storage in Glen Canyon Reservoir began in 1963.
Storage in Fontenelle Reservoir began in 1964.
Based upon provisional streamflow records subject to revision.
The 1995 flow is 9,485,100 acre-feet at Lees Ferry Arizona and 19,643 acre-feet at the Paria River.

The graphs on pages 27 and 28 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. The first graph, on page 27, 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., the flow of the river in millions of acre-feet past Lee Ferry for a given year had it not been depleted by activities of man. Each vertical bar has two components: The lower shaded part represents the estimated or measured historic flow at Lee Ferry, and the difference between the two sections of the bar in any given year represents the stream depletion, or the amount of water estimated to have been removed by man from the virgin supply upstream from Lee Ferry. It is worth noting that in 1977, and again in 1981, the historic flow at Lee Ferry exceeded the virgin flow. 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 14.9 million acre-feet) shows the long-term average virgin flow from 1896 through 1996. Because the Colorado River Compact is administered on the basis of running averages covering periods of ten years, the progressive ten-year average historic and virgin flows are displayed on this graph.

The second graph on page 28, entitled Lee Ferry Average Annual Flow for Selected Periods, is a graphical representation of historic and virgin flow averages for several periods of record. 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.

Several important hydrologic facts are apparent from these two graphs on pages 27 and 28.

(1) A vast majority of the high flows occurred prior to 1929.

(2) Since the 1924-1933 decade, the progressive ten-year average virgin flow has not exceeded the average virgin flow except in the 1941-1950 and the exceptionally wet 1975-1984 through 1984-1993 decades.

(3) For the period 1896-1921, which is prior to the Colorado River Compact of 1922, the average virgin flow 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 Lees Ferry, Arizona was not installed until 1921. Thus, the virgin flow at Lees Ferry prior to the 1922 Compact is estimated based upon records obtained at other stations, e.g. the stream gage on the Colorado River at Yuma, Arizona for the period 1902-1921.

(4) For the longest period shown, 1896-1996, the estimated average annual virgin flow is 14.9 million acre-feet and the average annual historic flow is 12.1 million acre-feet.

(5) For the next longest period, 1906-1996, the estimated average annual virgin flow is 15.0 million acre-feet and the average annual historic flow is 12.0 million acre-feet. Many of the early records for this series of years, as well as for the 1896-1996 period, are based upon the estimates of flows made at other gaging stations, as mentioned in (3) above. This average is about equal to the 15.0 million acre-feet estimated for the 1906-1967 period which was used as the basis

for justification of a water supply for the Central Arizona Project authorized in 1968.

(6) The estimated average annual virgin flow during the 1914-1996 period is 14.7 million acre-feet. This period is an extension of the 1914-1965 period used in the Upper Colorado Region Comprehensive Framework Studies of 1971. The average annual virgin flow for the 1914-1965 time period is 14.6 million acre-feet.

(7) The average annual virgin flow for the period 1914-1945 is 15.6 million acre-feet. This was the period of record used by the negotiators of the Upper Colorado River Basin Compact of 1948.

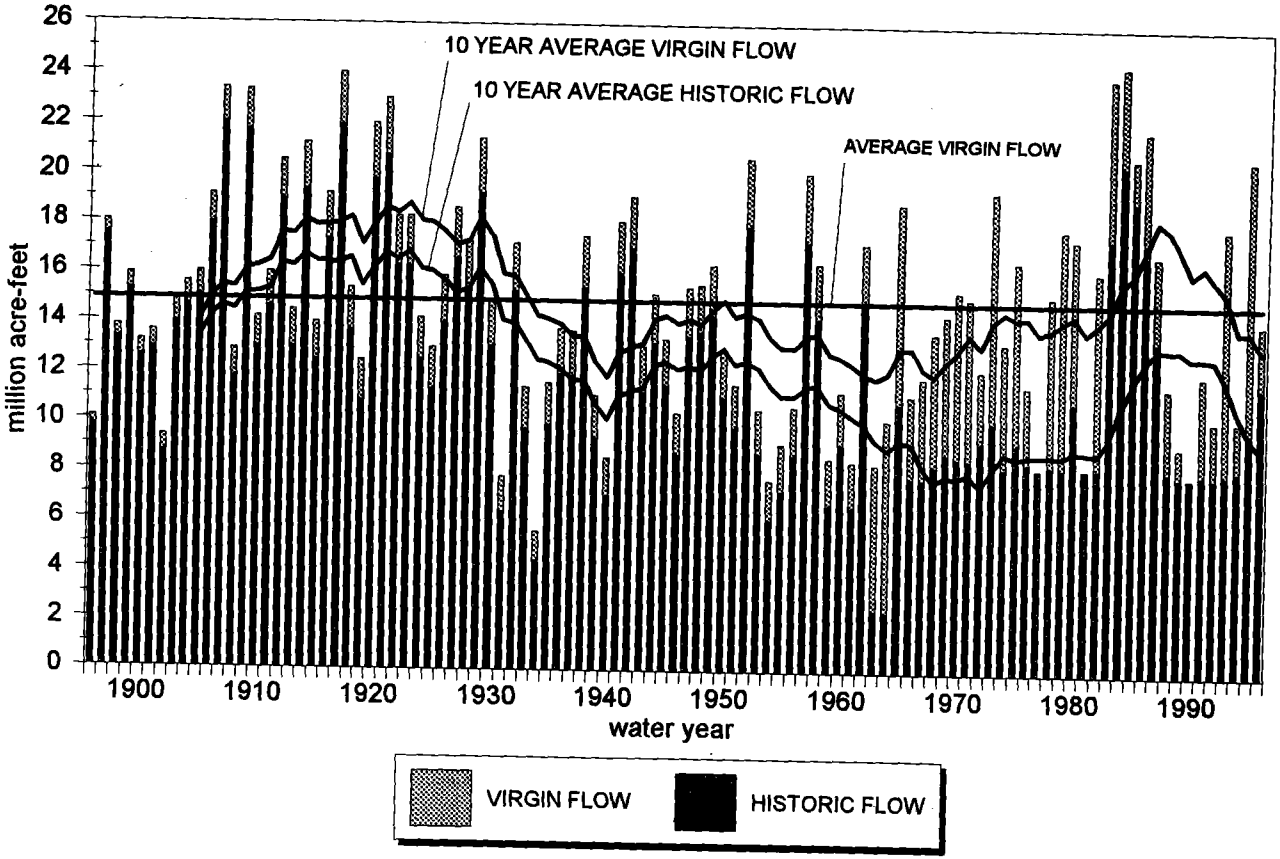
(8) For the period 1922-1996, which is the period of record since the signing of the Colorado River Compact, the average annual virgin flow is 14.2 million acre-feet and the average annual historic flow is 11.0 million acre-feet. Records for this series of years are based upon actual measurements of flows at Lees Ferry. The ten-year moving average flow since 1922 is considerably less than the ten-year moving average flow prior to 1922.

(9) Two completely unrelated ten-year periods of minimum flows have occurred since 1930. During these periods, 1931-1940 and 1954-1963, the average annual virgin flow amounts to only 11.8 million acre-feet.

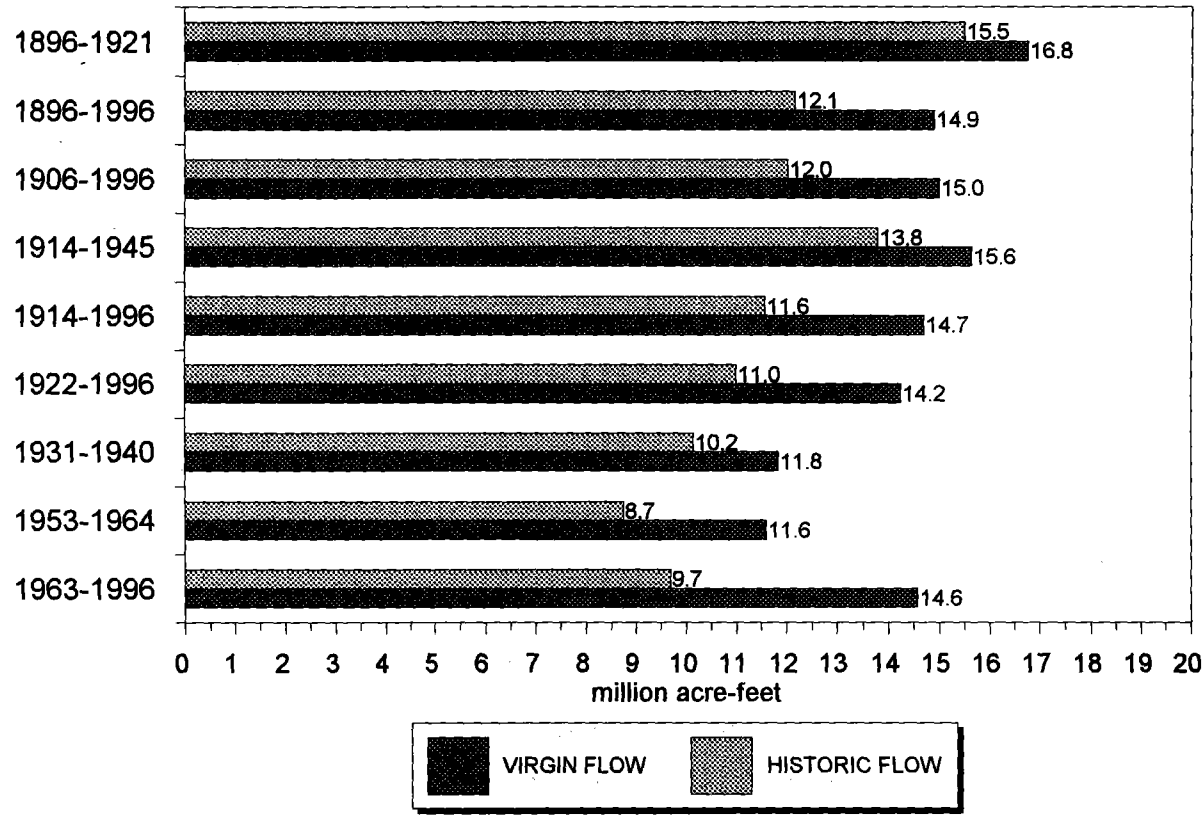
(10) For a 12-year period, 1953-1964, the average annual virgin flow amounts to only 11.6 million acre-feet.

(11) Since Glen Canyon Dam was closed in 1963, the estimated virgin flow for the subsequent 34 years is 14.6 million acre-feet. The estimated historical flow for the same period (1963-1996) is 9.7 million acre-feet.

Colorado River Flow
at Lee Ferry, Arizona



Lee Ferry Average Annual Virgin Flow For Selected Periods



B. LEGAL

1. Water Newsletter

The legal staff continues to inform the Commissioners, their advisers, and other interested parties about developments in the courts, Congress, and certain Federal agencies through the *Water Newsletter*. Current information can be found in the newsletter. In addition, the legal staff has prepared legal memoranda on matters needing more detailed treatment.

2. Court Cases

Action has been taken in a number of cases of importance to the Upper Colorado River Basin States. These cases include:

Catron County Board of Commissioners v. U. S. Fish and Wildlife Service, 10th Cir., 75 F.3d 1429, 26 ELR 20808. In this case appellants, the U. S. Fish and Wildlife Service (FWS) and various governmental officials, appeal the district court's order granting appellee Catron County's motion for summary judgment alleging that the Secretary of the Interior (Secretary), acting on behalf of FWS, failed to comply with the National Environmental Policy Act (NEPA) in designating certain lands within the County as critical habitat for the spikedace and loach minnow. The district court also granted the County's motion for injunctive relief but stayed its order pending appeal. The Tenth Circuit affirmed the decision of the district court. The Court first held that the County has standing to challenge the failure of the Department of the Interior (DOI) to comply with NEPA in designating critical habitat for these two species of fish, on the grounds that (1) flood damage to County property that the designation will allegedly cause by preventing the County from diverting and impounding water constitutes a threatened or imminent injury to a concrete and particularized legally protected interest; (2) the injuries are perceptible and environmental, not merely speculative or purely economic, and fall within the zone of interests protected by NEPA; (3) the County adequately demonstrated a causal link between its likely injury and DOI's failure to comply with NEPA; and (4) the County demonstrated a substantial likelihood that DOI compliance with NEPA will redress its claimed injury. Next, the Court held that DOI must comply with NEPA in designating critical habitat under the Endangered Species Act (ESA), because the two statutes are not mutually exclusive and the ESA procedures have not displaced NEPA's requirements; furthermore, compliance with NEPA will further the ESA's goals. After examining the legislative history of the ESA, the Court concluded that Congress intended that the Secretary comply with NEPA when designating critical habitat under the ESA when such designations constitute major Federal action significantly affecting the quality of the human environment. Finally, the Tenth Circuit held that the district court did not abuse its discretion in finding that the County's alleged injuries, supported by substantial evidence, constituted an imminent, irreparable injury warranting the grant of a preliminary injunction.

3. Legislation

In the Second Session of the 104th Congress (without regard to the water year), Congress enacted the following statutes that are important to the Upper Colorado River Basin States:

Public Law 104-323, approved October 19, 1996, Cache La Poudre River Corridor Act.

Public Law 104-301, approved October 11, 1996, Navajo-Hopi Land Dispute Settlement Act of 1996.

Public Law 104-298, approved October 11, 1996, Water Desalination Act of 1996.

Public Law 104-286, approved October 11, 1996, to amend the Central Utah Project Completion Act to direct the Secretary of the Interior to allow for prepayment of repayment contracts between the United States and the Central Utah Water Conservancy District dated December 28, 1965 and November 26, 1985, and for other purposes.

Public Law 104-206, approved September 30, 1996, Energy and Water Development Appropriations Act, 1997.

Public Law 104-182, approved August 6, 1996, Safe Drinking Water Act Amendments of 1996.

Public Law 104-180, approved August 6, 1996, Agriculture, Rural Development, Food and Drug Administration and Related Agencies Appropriations Act, 1997.

C. EDUCATION-INFORMATION

1. 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 Congress with respect to the development of the industrial and agricultural resources of the Upper Colorado River Basin.

The Commission 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 the States and various departments of government, supplying information, arranging and taking part in Congressional hearings, and providing other assistance requested.

2. 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. As materials are collected for inclusion in the library, they are cataloged in the Commission's computer system. Also, many thousands of pages of documents have been placed on microfiche. 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, supplemented, or collected to address the many problems associated with the development, utilization, and conservation of water and hydroelectric resources of the Colorado River Basin.

The continuing program of library expansion has been maintained. Emphasis is placed on the acquisition of information which illumines that growing body of law known as the "law of the river." Since the Environmental Protection Agency and the Western Area Power Administration have assumed an increasing importance in the water development field, documents from those agencies are being monitored and acquired as a part of the Commission's library.

3. Relief Model

The Relief Model of the Upper Colorado River Basin and the adjacent areas is available for display at conventions and other public events.

COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

A. AUTHORIZED STORAGE UNITS

(Information relative to storage units and participating projects has been provided by the United States Department of the Interior, Bureau of Reclamation.)

The Colorado River Storage Project (CRSP) was authorized for construction by the United States Congress in the Act of April 11, 1956 (70 Stat. 105). Four storage units were authorized by this Act: Glen Canyon Dam and Reservoir (Lake Powell) on the Colorado River in Utah and Arizona; 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 Wayne N. Aspinall Storage Unit (Aspinall Unit), formerly named the Curecanti Storage Unit and rededicated in July 1981, on the Gunnison River in Colorado. The Aspinall Unit consists of three dams and reservoirs: Blue Mesa, Morrow Point, and Crystal. Combined, the four storage units provide about 33,583,000 acre-feet of water storage capacity. The Act also authorized the construction of eleven participating projects. Ten additional participating projects have been authorized by subsequent congressional legislation.

The storage units and participating projects are described in the 47th and earlier annual reports of the Upper Colorado River Commission. Progress in construction, planning, operation, and investigation of the storage units and participating projects accomplished during the past water year is briefly outlined as follows:

1. Glen Canyon Storage Unit

Glen Canyon Dam and Reservoir (Lake Powell) comprises the key storage unit of the CRSP and is the largest of the initial four, providing about 80 percent of the storage and generating capacity. Construction of Glen Canyon Dam was completed in 1964.

a. Glen Canyon Environmental Studies (GCES) and the Glen Canyon Dam Environmental Impact Statement (EIS)

In 1982, the Department of the Interior initiated the GCES to quantify and qualify the environmental and recreational impacts of the operations of Glen Canyon Dam. Scientific evidence gathered during Phase I of the GCES indicated that significant impacts on downstream resources were occurring due to the operation of Glen Canyon Dam. These findings led to a July 1989 decision by the Secretary of the Interior for Reclamation to prepare an EIS to reevaluate dam operations. The purpose of the reevaluation was to determine specific options that could be implemented to minimize, consistent with law, adverse impacts on the downstream environment and cultural resources, as well as Native American interests in Glen and Grand Canyons. Analysis of an array of reasonable alternatives was needed to allow the Secretary to balance competing interests and to meet statutory responsibilities for protecting downstream resources, producing hydropower, and protecting affected Native American interests.

The Grand Canyon Protection Act of 1992 was enacted on October 30, 1992. Section 1802(a) of the Act requires the Secretary to operate Glen Canyon Dam:

> in accordance with the additional criteria and operating plans specified in section 1804 and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.

The EIS on the operation of Glen Canyon Dam was prepared with an unprecedented amount of scientific research, public involvement, and stakeholder cooperation. Over 33,000 comments were received on the Draft EIS, reflecting the national attention and intense interest in the EIS. The Final EIS was filed with the Environmental Protection Agency (EPA) on March 21, 1995. Nine alternative methods of operating Glen Canyon Dam (including a No Action Alternative) were presented in the Final EIS. The eight action alternatives were designed to provide a reasonable range of alternatives with respect to operation of the dam. One alternative would allow unrestricted fluctuations in flow (within the physical constraints of the powerplant) to maximize power production, four would impose varying restrictions on fluctuations, and three others would provide steady flows on a monthly, seasonal, or annual basis. The names of the alternatives reflect the various operational regimes.

The following table shows the specific operational criteria for each of the alternatives (the preferred alternative is highlighted):

TABLE 5

Operating Limits of Alternatives Identified for Detailed Analysis

	Unrestricted Fluctuating Flows		Restricted Fluctuating Flows				Steady Flows		
	No Action	Maximum Powerplant Capacity	High	Moderate	Modified Low	Interim Low	Existing Monthly Volume	Seasonally Adjusted	Year-Round
Minimum releases (cfs)[1]	1,000 Labor Day–Easter [2]3,000 Easter–Labor Day	1,000 Labor Day–Easter [2]3,000 Easter–Labor Day	3,000 5,000 8,000 depending on monthly volume, firm load, and market conditions	5,000	8,000 between 7 a.m. and 7 p.m. 5,000 at night	8,000 between 7 a.m. and 7 p.m. 5,000 at night	8,000	[3]8,000 Oct-Nov 8,500 Dec 11,000 Jan-Mar 12,500 Apr 18,000 May-Jun 12,500 Jul 9,000 Aug-Sep	Yearly volume prorated[4]
Maximum releases (cfs)[5]	31,500	33,200	31,500	31,500 (may be exceeded during habitat maintenance flows)	25,000 (exceeded during habitat maintenance flows)	20,000	Monthly volumes prorated	18,000 (exceeded during habitat maintenance flows)	Yearly volume prorated[4]
Allowable daily flow fluctuations (cfs/24 hours)	30,500 Labor Day–Easter 28,500 Easter–Labor Day	32,200 Labor Day–Easter 30,200 Easter–Labor Day	15,000 to 22,000	±45% of mean flow for the month not to exceed ±6,000	[6]5,000 6,000 or 8,000	[6]5,000 6,000 or 8,000	[7]±1,000	[7]±1,000	[7]±1,000
Ramp rates (cfs/hour)	Unrestricted	Unrestricted	Unrestricted up 5,000 or 4,000 down	4,000 up 2,500 down	4,000 up 1,5000 down	2,500 up 1,500 down	2,000 cfs/day between months	2,000 cfs/day between months	2,000 cfs/day between months
Common elements	None	None	Adaptive management (including long-term monitoring and research) Monitoring and protecting cultural resources Flood frequency reduction measures Beach/habitat-building flows New population of humpback chub Further study of selective withdrawal Emergency exception criteria						

[1] In high volume release months, the allowable daily change would require higher minimum flows (cfs).

[2] Releases each weekday during recreation season (Easter to Labor Day) would average not less than 8,000 cfs for the period from 8 a.m. to midnight.

[3] Based on an 8.23-million-acre-foot (maf) year; in higher release years, additional water would be added equally to each month, subject to an 18,000-cfs maximum.

[4] For an 8.23-maf year, steady flow would be about 11,400 cfs.

[5] Maximums represent normal or routine limits and may necessarily be exceeded during high water years.

[6] Daily fluctuation limit of 5,000 cfs for monthly release volumes less than 6\00,000 acre-feet; 6,000 cfs for monthly release volumes of 600,000 to 800,000 acre-feet; and 8,000 cfs for monthly volumes over 800,000 acre-feet.

[7] Adjustments would allow for small power system load changes.

b. Record of Decision (ROD) for the Operation of Glen Canyon Dam

The Secretary of the Interior signed the ROD on October 9, 1996. The ROD documents the selection of operating criteria for Glen Canyon Dam, as analyzed in the Final EIS. The Secretary's decision is to implement the Modified Low Fluctuating Flow Alternative (the preferred alternative) as described in the Final EIS with a minor change in the timing of beach/habitat building flows. This alternative was selected because it will reduce daily flow fluctuations well below the no action levels (historic pattern of releases), and will provide high steady releases of short duration which will protect or enhance downstream resources while allowing limited flexibility for power operations.

The Modified Low Fluctuating Flow Alternative incorporates beach/habitat-building flows which are scheduled high releases of short duration designed to rebuild high elevation sandbars, deposit nutrients, restore backwater channels, and provide some of the dynamics of a natural system. In the Final EIS, it was assumed that these flows would occur in the spring with a frequency of one in ten years.

The Basins States expressed concern over the beach/habitat-building flows described in the Final EIS because of the necessity to bypass the powerplant to release the 45,000 cubic feet per second (cfs) flow. These concerns have been accommodated, while still maintaining the objectives of the beach/habitat-building flows. Instead of conducting these flows in years in which Lake Powell storage is low on January 1, they will be accomplished by utilizing reservoir releases in excess of powerplant capacity required for dam safety purposes. Such releases are consistent with the 1956 Colorado River Storage Project Act, the 1968 Colorado River Basin Project Act, and the 1992 Grand Canyon Protection Act.

The up-ramp rate and maximum flow criteria were also modified between the Draft and Final EIS. The up-ramp rate was increased from 2,500 cfs per hour to 4,000 cfs per hour, and the maximum allowable release was increased from 20,000 to 25,000 cfs. These modifications were made to enhance power production flexibility, as suggested by comments received. These modifications were controversial among certain interest groups because of concerns regarding potential impacts on resources in the Colorado River and the Grand Canyon. However, an analysis conducted by Reclamation indicates that there would be no significant differences in impacts associated with these changes ("Assessment of Changes to the Glen Canyon Dam EIS Preferred Alternative from Draft to Final EIS," October 1995).

The 4,000 cfs per hour up-ramp rate limit will be implemented with the understanding that results from the monitoring program will be carefully considered. If impacts differing from those described in the Final EIS are identified, a new ramp rate criterion will be considered by the Adaptive Management Work Group and a recommendation for action forwarded to the Secretary.

The maximum flow criterion of 25,000 cfs will be implemented with the understanding that actual maximum daily releases would only occasionally exceed 20,000 cfs during a minimum release year of 8.23 million acre-feet (maf). This is because the maximum allowable daily change constraint overrides the maximum allowable release, and because monthly release volumes are lower during minimum release years. If impacts differing from those described in the Final EIS are identified through the Adaptive Management Program, the maximum flow restriction will be reviewed by the Adaptive

Management Work Group and a recommendation for action will be forwarded to the Secretary.

As part of the preferred alternative, habitat maintenance flows, designed to reform backwaters and maintain sandbars, will consist of high, steady releases within the powerplant capacity of 33,200 cfs for one or two weeks in March, or other months if recommended through the Adaptive Management Program. These flows have been selected to redistribute sediment accumulation in pools and backwaters, rebuild portions of sandbars above the normal peak stage, and prevent return channels from becoming dominated with vegetation. Habitat maintenance flows, defined as steady flows with minor fluctuations of up to ±1,000 cfs, would permit limited voltage regulation within the power grid. The month of March was selected to allow backwater channels to reform prior to the humpback chub spawning period, and because more sediment is likely to be supplied by tributary flow in March than later in the spring.

Habitat maintenance flows would not be scheduled when the projected storage in Lake Powell on January 1 is greater than 19 maf. Annual release volumes under such conditions are typically greater than the minimum release objective of 8.23 maf, and such flows already may be near or exceed powerplant capacity. Maintenance flows would begin by increasing flows at a rate no greater than 4,000 cfs per hour and would conclude by decreasing flows back to the normal operating range at a rate no greater than 1,500 cfs per hour. The limit on daily change in flow would not apply during these transitions.

Habitat maintenance flows would differ from beach/habitat-building flows because they would be within powerplant capacity and would occur nearly every year when the reservoir is low. Beach/habitat-building flows would be conducted in years in which reservoir releases in excess of powerplant capacity were required for dam safety purposes. Habitat maintenance flows would not occur in years when a beach/habitat-building flow occurs. Neither of these special releases would be scheduled in a year when there is concern for endangered fish or other sensitive resources.

i. Basis for Decision

The goal of implementing a preferred alternative was not to maximize benefits for the most resources, but rather to find an alternative operating plan that would permit recovery and long-term sustainability of downstream resources, while limiting hydropower capability and flexibility only to the extent necessary to achieve recovery and long-term sustainability.

The Modified Low Fluctuating Flow Alternative was selected for implementation because it satisfies the critical needs for sediment resources and some of the habitat needs of native fish, benefits the remaining resources, and allows for future hydropower flexibility, although there would be moderate to potentially major adverse impacts on power operations and possible decreases in long-term firm power marketing. Nearly all downstream resources are dependent to some extent on the sediment resource. This alternative meets the critical requirements of the sediment resource by restoring some of the pre-dam variability through floods, and by providing a long-term balance between the supply of sand from Grand Canyon tributaries and the sand-transport capacity of the river. This, in turn, benefits the maintenance of habitat. The critical requirements for native fish are met by pursuing a strategy of warming releases from Glen Canyon Dam, enhancing the sediment resource, and substantially limiting the daily flow fluctuations.

ii. General Accounting Office (GAO) Audit

In compliance with the Grand Canyon Protection Act, the Secretary of the Interior could not issue the Record of Decision until considering the findings of the GAO audit. Those findings were issued on October 2, 1996. The audit generally concludes that Reclamation used appropriate methodologies and the best available information in determining the potential impact of various dam flow alternatives on important resources. The audit also determined that most of the key parties (83 percent of respondents) support Reclamation's preferred alternative for dam operations, although some concerns remain.

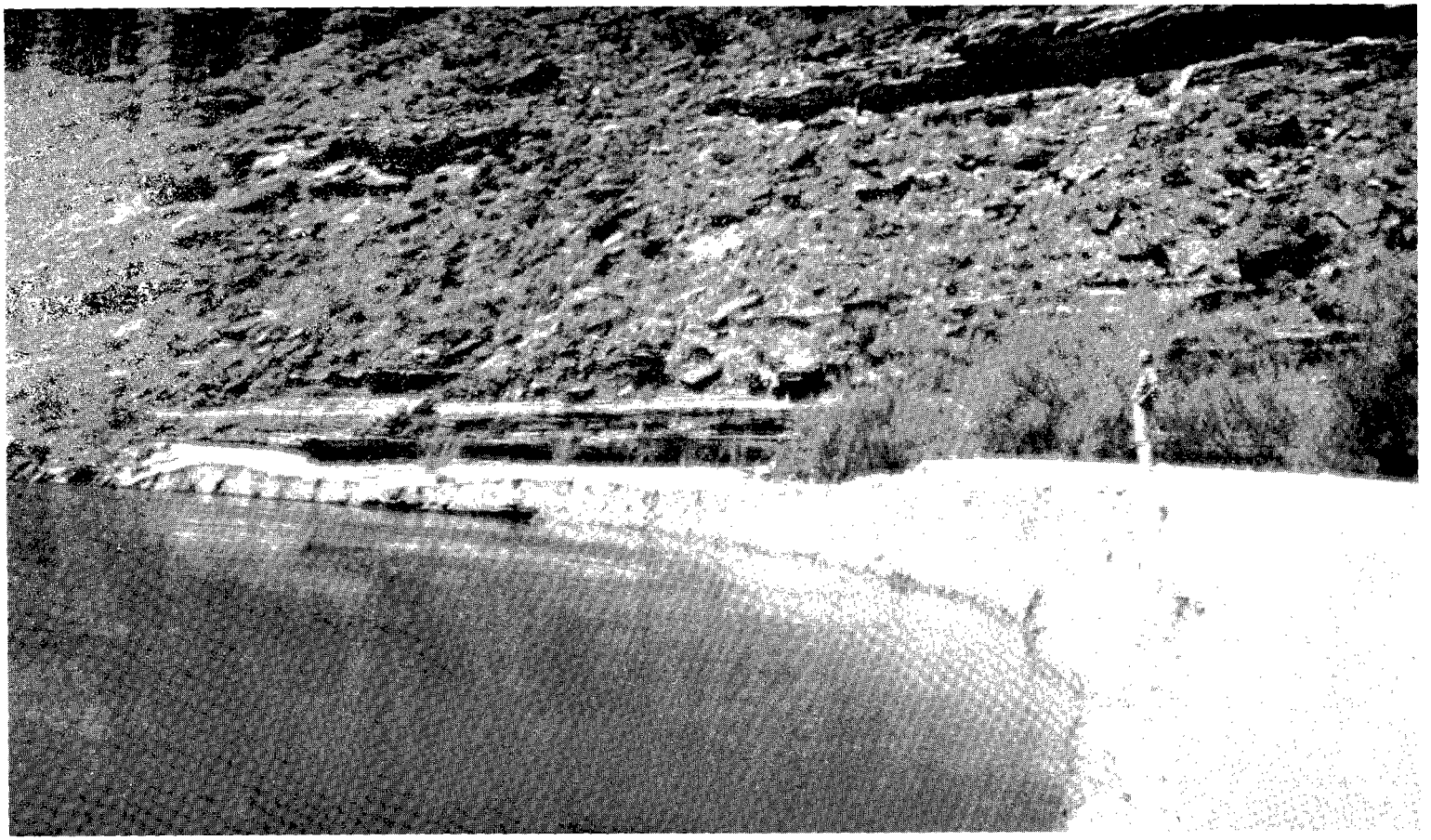
c. Beach/Habitat-Building Test Flow

Reclamation conducted a test of a beach/habitat-building flow from Glen Canyon Dam in the spring of 1996 to allow for collection of data for use in determining future dam operations. The test flow began on March 22, 1996. The first four days consisted of a constant 8,000 cfs flow. On March 26, 1996, discharge was increased at an up-ramping rate of 4,000 cfs per hour until a flow of 45,000 cfs was reached. Flows were held essentially constant at 45,000 cfs for seven days (until April 2, 1996), with flow changes less than $\pm$1,000 cfs. Discharge was then decreased to 8,000 cfs in the following manner: (1) Between flows of 45,000 cfs and 35,000 cfs, the down-ramping rate was 1,500 cfs per hour; (2) Between flows of 35,000 cfs and 20,000 cfs, the down-ramping rate was 1,000 cfs per hour; and (3) Between 20,000 cfs and 8,000 cfs, the down-ramping rate was 500 cfs per hour. Discharge was then maintained at 8,000 cfs for four days (through April 7, 1996). The staggered down-ramp was used because it was believed to more closely mimic the reduction of flows after a natural flood. The 8,000 cfs constant flows preceding and following the 45,000 cfs release permitted aerial photography and on-the-ground evaluation of sedimentation patterns and impacts to river resources. Interim flows resumed on April 8, 1996, and will remain in effect until Operating Criteria and an annual plan of operation are approved by the Secretary of the Interior.

Initial studies showed that the test flood helped revive the Grand Canyon. There is a growing body of scientific evidence that controlled floods, like controlled fires, are a valuable management tool. However, further data collected during and after the test flow will demonstrate the extent to which planned flooding can be used in the future.

d. Adaptive Management

A key element of the Glen Canyon Dam EIS was the formation of the Adaptive Management Program to guide future monitoring and research of the impacts in both Glen and Grand Canyons from continued operation of Glen Canyon Dam. The program has two key groups: an Adaptive Management Work Group made up of a broad base of constituencies involved with river resources, and the Grand Canyon Monitoring and Research Center which works with the Adaptive Management Work Group on identified monitoring and research needs. The program provides for flexibility in adjusting dam operations to lessen impacts or improve resource conditions downstream. It is an innovative approach to resource management designed to provide for rapid response to both future problems and opportunities.



Restored Beach - Glen Canyon Dam

- Bureau of Reclamation Photo

e. Recreational Use

The extensive recreational use of Glen Canyon National Recreation Area, which surrounds Lake Powell, is demonstrated by the visitation of 2,538,684 people during 1995 (latest figure available). The National Park Service has concession-operated facilities at Wahweap, Dangling Rope, Halls Crossing, Hite, and Bullfrog Basin on the reservoir, and at Lees Ferry located 16 miles below the dam on the Colorado River. The San Juan Marina, which was operated on Lake Powell by the Navajo Nation, is now closed due to a flood in 1989.

From 1909 through 1961, an estimated total of 20,972 people visited Rainbow Bridge. When access to the bridge by water was made available by completion of the dam in 1963, visitation rapidly increased. In 1966, 20,468 people visited Rainbow Bridge, almost as many people as had visited the site during the previous 53 years. In 1995, 346,151 people visited Rainbow Bridge (latest figure available).

The Carl Hayden Visitor Center, atop Glen Canyon Dam and powerplant in Page, Arizona, was recently selected as a Federal Energy Showcase facility by the Department of Energy for the significant achievements made in water and energy conservation throughout the center. A ceremony was held on September 12, 1996 commemorating the center's selection as a showcase facility.

2. Flaming Gorge Storage Unit

Flaming Gorge Dam and Powerplant were completed in 1963. Uprating of the units in 1992 increased the plant nameplate capacity from 108 megawatts (MW) to about 151 MW. Plans have been developed to retrofit the visitor center and dam tour areas to make the facilities fully accessible to persons with disabilities.

Flaming Gorge National Recreation Area, which surrounds Flaming Gorge Dam and Reservoir, recorded approximately 2,270,000 visitors during 1995 (latest figure available). The site is administered by the Supervisor's Office of Ashley National Forest. Fishing is an important recreational activity both on the reservoir and in the Green River below the dam.

Dutch John, Utah was founded by Reclamation in 1958 on Reclamation lands as a community to house personnel, administrative offices, and equipment for construction and operation of Flaming Gorge Dam and Reservoir. Housing, administrative offices, storage/maintenance buildings, and other public buildings and infrastructure were constructed and continue to be owned and maintained by Reclamation.

In 1968, Reclamation lands surrounding the reservoir, including the Dutch John townsite, were included within the boundaries of the Flaming Gorge National Recreation Area, administered by the Forest Service. Since that time, Reclamation and the Forest Service have shared the costs of providing basic services for and administration and maintenance of the community and its infrastructure. Reclamation and the Forest Service have now determined that certain lands and structures are no longer essential to management of the project or the National Recreation Area.

Residents of the community are interested in purchasing the homes they currently rent from Reclamation and the lands upon which they were built. Daggett County is

interested in reducing the financial burden it accrues in providing local government support services to a federally-owned community which produces little direct tax revenue.

Toward the end of the last session of Congress, Representative Bill Orton introduced legislation which, among other things, would have authorized Reclamation and the Forest Service to convey ownership of the Dutch John community housing to the current occupants and ownership of the public buildings, infrastructure, and appurtenant lands to Daggett County. With certain reservations, Reclamation and the Forest Service supported privatization; however, the legislation did not pass before Congress adjourned. In a cooperative effort among Reclamation, the Forest Service, Daggett County and a Dutch John citizens group, the legislation will be redrafted for reintroduction some time in 1997.

3. Navajo Storage Unit

The major purposes of Navajo Dam and Reservoir are to regulate the flows of the San Juan River and to provide a water supply for the Navajo Indian Irrigation Project near Farmington, the San Juan-Chama participating project in the Rio Grande Basin, and the Hammond participating project, all in New Mexico. Part of the water is also used for municipal and industrial (M&I) purposes in northwestern New Mexico. Navajo Dam was completed in 1963.

Under a Memorandum of Agreement with Reclamation, the Colorado Division of Parks and Outdoor Recreation is responsible for public recreation at Navajo Reservoir, within the State of Colorado, until the year 2014. The State has also entered into a cost-share agreement with Reclamation for the rehabilitation of existing recreation facilities and/or expansion, if appropriate. Preliminary design facilities will be initiated in 1998 with actual construction anticipated in 1999.

The long-term recreation management agreement between Reclamation and the New Mexico Energy, Minerals, and Natural Resources Department will expire in January 1997. At that time, a new agreement will be negotiated by both parties which will allow the State of New Mexico to continue to manage public recreation on Navajo Reservoir land and water areas within the State. A cost-share agreement has been signed with the State for rehabilitation of facilities. Construction of facilities has already started and will continue as cost-share funds become available.

Total recreation visitation to Navajo Reservoir was 620,614 people in 1995 (latest figure available).

In early March 1996, the Interior Management Council designated a Reclamation and Bureau of Land Management (BLM) proposal designed to resolve long-standing resource management issues within and around Navajo Reservoir as an official National Performance Review (NPR) Reinvention Laboratory. Jurisdiction over the 218,000 acres of mostly federally-owned land surrounding Navajo Reservoir is split between BLM and Reclamation.

Under the recently sanctioned laboratory, a team composed of agency members, Native American representatives and stakeholder groups will develop and implement a five-year cooperative ecosystem management program intended to improve resource management in the area, restore and sustain a healthy ecosystem, and enhance customer

service. The program will also attempt to erase artificial jurisdictional lines which have previously divided a natural ecosystem. Following completion of NPR training and chartering requirements, the team will work to communicate directly with customer groups who use and enjoy the natural resources at Navajo.

4. Wayne N. Aspinall Storage Unit

The Aspinall Unit includes three major dams and powerplants in the canyon of the Gunnison River downstream from Gunnison, Colorado and upstream from the Black Canyon of the Gunnison National Monument. The three dams are Blue Mesa, Morrow Point and Crystal. Uprating of Morrow Point Dam generator units was completed in 1993. The plant nameplate capacity was increased from 120 MW to 156 MW. The National Park Service administers the recreational facilities. In 1995 there were 993,072 visitors (latest figure available).

5. Storage Units Fishery Information

The Flaming Gorge, Wayne N. Aspinall, Glen Canyon and Navajo Units continue to provide excellent warm- and cold-water fishing both in the reservoirs and in the tailwater streams below the dams. Visitor days on the reservoirs total between six and seven million each year. Lake Powell provides approximately 40 percent of the total use, with the remainder coming from the other reservoirs. Lake Powell is almost exclusively a warm-water fishery with striped bass, crappie, walleye, channel catfish, and smallmouth and largemouth bass as the harvested species. Angling use on reservoirs appears to be constant, while demand and use for the tailwaters is increasing dramatically (Reclamation does not gather specific data on angler usage at its reservoirs).

Navajo and Flaming Gorge Reservoirs provide both warm-water and cold-water fishing, with rainbow trout and kokanee the predominant cold-water harvest and catfish, bass, and crappie (at Navajo only) the preferred warm-water fishes. Flaming Gorge also provides a world-class lake trout fishery. The Aspinall reservoirs are exclusively cold-water fisheries, with kokanee and rainbow trout the predominant catch.

The four tailwaters (the San Juan River below Navajo Dam, the Green River below Flaming Gorge Dam, the Gunnison River below Crystal Dam, and the Colorado River below Glen Canyon Dam) have provided "blue ribbon" trout fishing that many view as some of the best in the western United States. The Green River (below Flaming Gorge Dam) receives about one half of the total use with the Colorado River (below Glen Canyon Dam), the San Juan River (below Navajo Dam), and the Gunnison River (below Crystal Dam) providing the remainder.

B. TRANSMISSION DIVISION

The power system includes high voltage transmission lines that interconnect to the CRSP hydro-powerplants and deliver power to major load centers or other delivery points. The system is interconnected with adjacent federal, public, and private utility transmission systems. The Transmission Division was transferred to the Department of Energy, Western Area Power Administration, in fiscal year 1978.

Generation at CRSP powerplants amounted to 7.3 billion kilowatt-hours during water year 1996. The major portion, 5.5 billion kilowatt-hours, was produced at Glen

Canyon Dam. The balance was produced at Flaming Gorge, Blue Mesa, Morrow Point, Crystal, Fontenelle, and Towaoc Powerplants (McPhee Powerplant was out of service for repairs during fiscal year 1996).

The following table lists the gross generation for fiscal years 1995 and 1996 and the percentage of change:

GROSS GENERATION (Kilowatt-Hours)

Powerplant	FY 1995	FY 1996	Percent Change
Glen Canyon	4,425,341,000	5,515,385,000	+20
Flaming Gorge	393,314,000	670,326,000	+41
Blue Mesa	354,145,000	367,878,000	+4
Morrow Point	519,009,000	468,309,000	-10
Crystal	164,525,000	217,590,000	+24
Fontenelle	56,482,000	71,548,000	+21
McPhee	0	0	0
Towaoc	13,049,000	19,114,800	+32
Total	5,925,865,000	7,330,150,800	+19

C. 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, 1963 (76 Stat. 96), three were authorized by the Act of September 2, 1964 (78 Stat. 852), and five were authorized by the Act of September 30, 1968 (82 Stat. 886). Eleven are in Colorado, three in New Mexico, two in Utah, three in Wyoming, one in both Colorado and Wyoming and one in both Colorado and New Mexico. Participating projects develop, or would develop, water in the Upper Colorado River System for irrigation, M&I uses, and other purposes and participate in the use of revenues from the Upper Colorado River Basin Fund to help repay the costs of irrigation features that are beyond the ability of the water users to repay.

The following are completed participating projects:

Project	State	Dam	Year Completed
Paonia	Colorado	Paonia	1962
Smith Fork	Colorado	Crawford	1962
Florida	Colorado	Lemon	1963
Silt	Colorado	Rifle Gap	1966
Bostwick Park	Colorado	Silver Jack	1971
Dallas Creek	Colorado	Ridgway	1991
Hammond	New Mexico	---	1962
San Juan-Chama	New Mexico	Heron	1971
Vernal Unit, CUP	Utah	Steinaker	1961
Emery County	Utah	Joes Valley	1966
Lyman	Utah	Stateline	1979
Eden	Wyoming	Big Sandy	1952
Eden	Wyoming	Eden	1959
Seedskadee	Wyoming	Fontenelle	1968
Lyman	Wyoming	Meeks Cabin	1971

The present status of construction or investigation for the remaining participating projects follows:

1. Colorado

a. Fryingpan-Arkansas Project

Although the Fryingpan-Arkansas Project is not a participating project of the Colorado River Storage Project because it does not participate in the Upper Colorado River Basin Fund, it is sometimes referred to as a limited participating project because it does utilize water diverted from the Upper Colorado River System to the eastern slope of Colorado.

The Eastern Colorado Area Office, located in Loveland, Colorado, directs the operation and maintenance activities of the Fryingpan-Arkansas Project. A field office in

Pueblo coordinates with the Southeastern Colorado Water Conservancy District and the State Division Engineer.

NEPA compliance on the Ruedi Round II water marketing program was completed on January 16, 1990 with the signing of a record of decision on the proposed action. The proposed action made 51,500 acre-feet of water available for marketing to western slope contractors. As a result of Endangered Species Act (ESA) consultation on the proposed action, 5,000 acre-feet of this total would be withheld from water sales and released to benefit Colorado River endangered fishes. Operational changes make an additional 5,000 acre-feet available to benefit the Colorado River endangered fishes in 4 years out of 5. After Round I sales of 7,850 acre-feet, 38,650 acre-feet of water was available for marketing in Round II. Since 1990, Fish and Wildlife Service (FWS) has listed the razorback sucker and identified and listed critical habitat for the four Colorado River endangered fishes, both of which could be affected by the Round II water marketing program.

To comply with the ESA, Reclamation reinitiated consultation with FWS on the effects of the Ruedi Water Marketing Program on the Colorado River endangered fishes and critical habitat. On May 26, 1995, FWS issued a biological opinion on the effects of the Ruedi Round II water marketing program on the Colorado River endangered fishes and designated critical habitat. Prior to consultation, Reclamation identified 17,000 acre-feet of immediate needs that should be contracted for in Round II. This left 21,650 acre-feet of uncommitted water in Ruedi. The FSW's May 26, 1995 biological opinion contained two reasonable and prudent alternatives to jeopardy. One was continuing commitments made in the 1990 EIS and the other was to develop an agreement among FWS, Reclamation and the Colorado Water Conservation Board, to make the remaining uncommitted yield available to enhance flows in the 15-Mile Reach of the Colorado River. Reclamation is in the process of developing an agreement with the FWS and Colorado Water Conservation Board to make this water available to benefit flows in the 15-Mile Reach.

Contents of reservoirs within the Fryingpan-Arkansas Project as of September 30, 1996 were as follows: Ruedi Reservoir, 87,828 acre-feet; Turquoise Lake, 113,281 acre-feet; combined Mt. Elbert Forebay and Twin Lakes Reservoir, 132,859 acre-feet; and Pueblo Reservoir, 198,521 acre-feet. During water year 1996 (October 1, 1995 through September 30, 1996) transmountain diversions from the Colorado River Basin in Colorado by the Fryingpan-Arkansas Project via the Charles H. Boustead Tunnel totaled 36,920 acre-feet.

b. Dolores Project

Dolores Project construction began in 1976. During fiscal year 1995, all primary project facilities were completed and in operation. Work yet to be completed includes remaining wetland mitigation, Towaoc Drains, Rocky Ford Lateral operation and maintenance roads, Great Cut Dike road improvements, other remaining construction and design deficiency work, and acquisition of 3,900 acre-feet of water for downstream fish and wildlife purposes. Dolores Project construction is scheduled for completion in 1998.

Reclamation has negotiated agreements with the three primary contractual beneficiaries: the Dolores Water Conservancy District (District), Montezuma Valley Irrigation Company, and Ute Mountain Ute Indian Tribe. These cooperative agreements and grants provide for the benefitting entities to complete the work, rather than using Reclamation's

traditional construction methods. Cost savings from this approach are applied toward acquisition of water for downstream fish and wildlife purposes from the District.

As a result of salinity control modifications to the Upper Hermana, Lone Pine and Rocky Ford Laterals (parts of the Dolores Project), 24 acres of new wetlands were developed (Lome Dome Wetlands Area) and 54 acres of existing wetlands were enhanced by the Colorado Division of Wildlife (CDOW) through a cooperative agreement with Reclamation. Development of the wetlands was funded by Reclamation to mitigate the loss of habitat resulting from modifications to the Dolores Project. A long-term management agreement between Reclamation and the CDOW for operation and maintenance of the Lome Dome Wetlands Area is currently being negotiated. In the interim, Reclamation is providing the full cost of operation and maintenance to the CDOW, pursuant to existing law.

c. Fruitland Mesa Project

As required by Section 204(l) of the Federal Land Policy and Management Act (P.L. 94-579), Reclamation completed a withdrawal review on lands withdrawn for the Fruitland Mesa Project. In December 1988, Reclamation submitted a report to BLM recommending that its withdrawals for this project, totaling approximately 22,600 acres, be terminated in their entirety. That recommendation has not yet been processed by BLM. In September 1996, the Interior Department's Inspector General completed an audit report entitled, "Withdrawn Lands, Department of the Interior." As a result of recommendations made in that audit report, it is anticipated that BLM will soon begin to clear a large backlog of unprocessed recommendations.

d. San Miguel Project - West Divide Project

Both projects have been found to be economically unjustified at this time. As required by Section 204(l) of the Federal Land Policy and Management Act (P.L. 94-579), Reclamation completed a withdrawal review on lands withdrawn for the West Divide Project. In March 1987, Reclamation submitted a report to BLM recommending that its withdrawal for this project, totaling approximately 739.6 acres, be terminated in its entirety. That recommendation has not yet been processed by BLM. In September 1996, the Interior Department's Inspector General completed an audit report entitled, "Withdrawn Lands, Department of the Interior." As a result of recommendations made in that audit report, it is anticipated that BLM will soon begin to clear a large backlog of unprocessed recommendations.

e. Dallas Creek Project

Block notice number one was issued for the Dallas Creek Project on May 31, 1989, covering all M&I water use. The notice involved 28,100 acre-feet of water. Repayment on that notice began in 1990. Block notice number two was issued on March 21, 1990. The notice included all irrigation waters for the project, involving 11,200 acre-feet. The notice was issued to Tri-County Water Conservancy District. The first payment under the repayment contract was made in February 1993 and will continue until February 2042.

Rock and gravel scour has resulted in damage to the floor of the river outlet works at Ridgway Reservoir. Repairs are planned for fiscal years 1997 and 1998. Work will be accomplished in two steps. The first contract, to extend the bypass pipe in the outlet works

beyond the stilling basin, was awarded to Nordic Industries of Marysville, California. Construction will begin in January 1997. A second contract, scheduled to be awarded next winter, will repair the concrete in the outlet works stilling basin.

Recreation development at Ridgway Reservoir was officially completed on September 30, 1995. Total cost of the recreation facilities exceeded $21 million.

f. Smith Fork Project

The major building and site work contract for the rehabilitation of existing recreation facilities at Crawford Reservoir will begin in December 1996. Rehabilitation will include water, sewer, electric, and road upgrades, campground expansion and modification, and construction of a maintenance building. Construction is expected to be completed in 1997.

g. Silt Project

The appropriate National Environmental Policy Act (NEPA) document for the rehabilitation of recreation facilities and associated infrastructure at Rifle Gap Reservoir will be prepared in 1997.

h. Paonia Project

As part of the recreation rehabilitation effort at Paonia Reservoir, all existing vault toilets will be replaced by July 1997.

i. Colorado River Basin Salinity Control Project

As part of the Grand Valley Unit, Colorado River Basin Salinity Control Project (as amended in 1984), Reclamation is acquiring and developing habitat replacement lands along the Colorado River in western Colorado. The habitat program is designed to offset habitat losses that occur when canals and laterals are lined for salinity control.

To date, Reclamation has acquired 1,720 acres, including withdrawal of 496 acres of BLM land. An acquisition contract has been signed for an additional 450 acres with closing scheduled for the spring of 1997. Thus, the program will protect 2,170 acres of riparian wildlife habitat along the Colorado River. These lands consist of five parcels. Development of habitat is nearly complete on three of the areas, and they are being managed as the Horsethief Canyon State Wildlife Area, Colorado River Wildlife Area and Grand Junction Wildlife Area. Managers for the areas are the Colorado Division of Wildlife, Colorado State Parks/Mesa County Land Conservancy and Mesa County Land Conservancy, respectively. Development on the remaining two parcels will continue for several more years.

Riparian areas are one of the most limited and threatened habitats in western Colorado, yet they are clearly one of the most important habitats in the arid west. Over 80 percent of the breeding birds in Colorado are dependent on this limited habitat, and overall biological diversity is very high.

Developments on the lands have stressed protection and expansion of riparian cottonwood stands, creation of ponds and wetlands, development of permanent nesting

cover and control of weeds. Recreation use is limited to protect the primary purpose of the properties — wildlife habitat replacement. In the future, uses for educational purposes and "watchable wildlife" are expected to increase.

In addition, Reclamation is coordinating with the Colorado "Legacy Program" whereby river corridors are protected for open space, recreation and wildlife habitat and with the Colorado River Endangered Fishes Recovery Program whereby backwater areas along the Colorado River are protected.

2. Colorado and New Mexico

a. Animas-La Plata Project

The Animas-La Plata Project is a proposed Reclamation project which would provide storage water to southwestern Colorado and northwestern New Mexico. As currently conceived, the project would provide water for the settlement of tribal water rights for the Ute Mountain Ute and Southern Ute Indian Tribes, as well as M&I and irrigation water to other citizens of Colorado, New Mexico and the Shiprock community of the Navajo Nation.

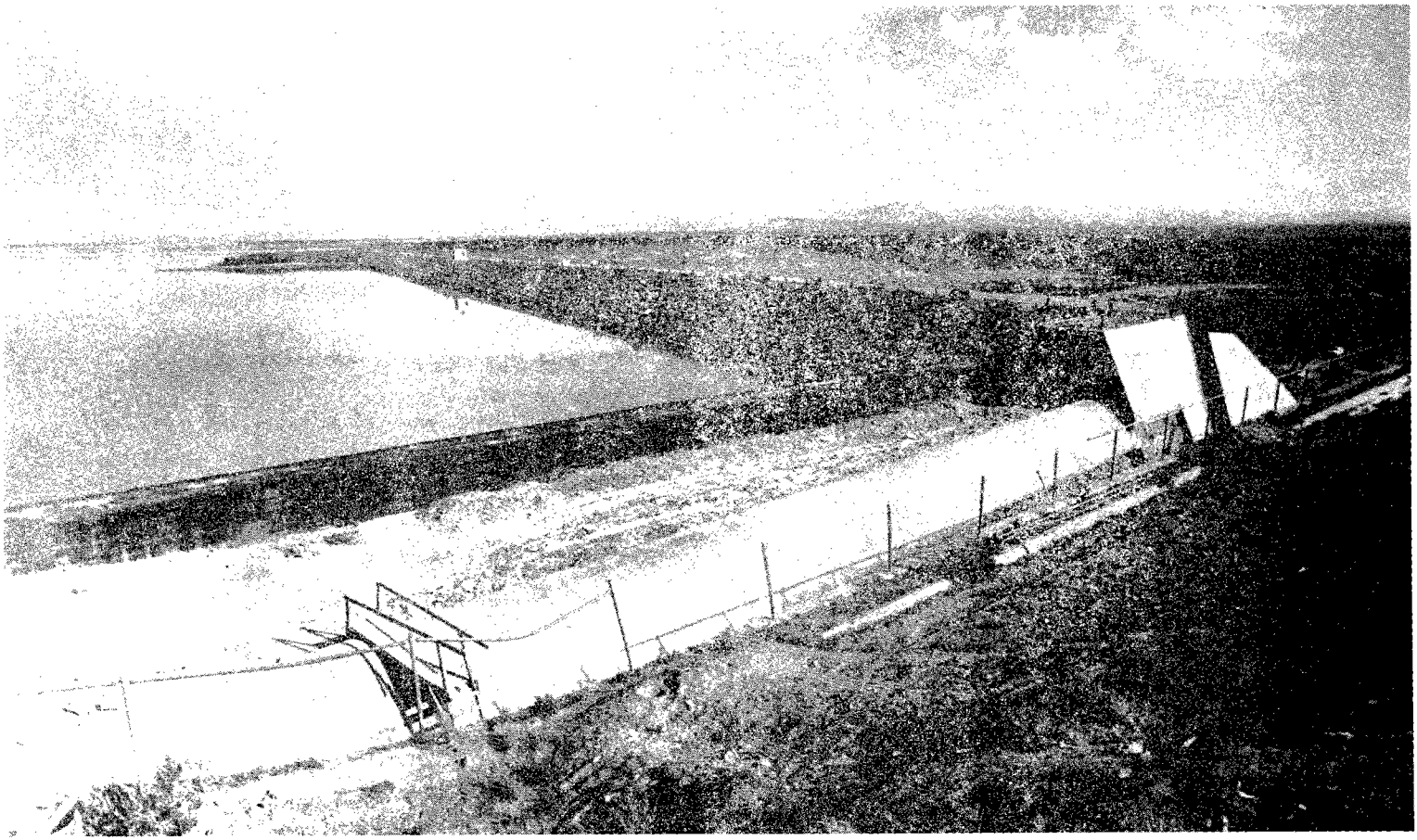
The Final Supplement to the Final Environmental Statement for the Animas-La Plata Project was filed with the EPA on April 26, 1996. The EPA requested, and was granted on May 2, 1996, a 90-day extension to evaluate the Supplement. The extension provided additional time for Reclamation and EPA to continue to work together in an effort to discuss and resolve water quality and other outstanding issues raised by the project, and deferred a possible referral by EPA to the White House Council on Environmental Quality. Additional extensions were granted as the parties continued work on resolving the issues.

The project has been the focus of continuing controversy and litigation for many years. In the fall of 1996, in an attempt to resolve the disputes surrounding the project, Colorado Governor Roy Romer and Lt. Governor Gail Schoettler brought together the various stakeholders for a discussion process, known as the Romer/Schoettler process. It is the intent of the stakeholders to use this discussion process to work toward finding solutions to issues surrounding the Animas-La Plata Project.

3. Colorado and Wyoming

a. Savery-Pot Hook Project

As required by Section 204(l) of the Federal Land Policy and Management Act (P.L. 94-579), Reclamation completed a withdrawal review on lands withdrawn for the Savery-Pot Hook Project. In April 1983, Reclamation submitted a report to BLM recommending that its withdrawals for this project, totaling approximately 11,303 acres, be terminated in their entirety. That recommendation has not yet been processed by BLM. In September 1996, the Interior Department's Inspector General completed an audit report entitled, "Withdrawn Lands, Department of the Interior." As a result of recommendations made in that audit report, it is anticipated that BLM will soon begin to clear a large backlog of unprocessed recommendations.



Big Sandy Dam and Reservoir - Wyoming

- Bureau of Reclamation Photo

4. New Mexico

a. Navajo Indian Irrigation Project

Reclamation is continuing toward completion of the Navajo Indian Irrigation Project in San Juan County, New Mexico.

Reclamation is providing design and construction management for the Bureau of Indian Affairs (BIA). In this process, funding is sought by BIA in its budget appropriation rather than by Reclamation. The President's fiscal year 1998 budget includes $25.5 million for continued design and construction of the project.

By the end of 1996, blocks 1 through 7 were producing high-value crops on approximately 63,800 acres of land. The entire project involves 11 blocks of development and will have a total of 110,630 acres of irrigated land.

Construction of facilities to serve block 8 started in 1992 and is continuing. Some major facilities have been completed, and progress is continuing under two contracts totaling about $18 million for construction of the Gallegos Pumping Plant. Two other contracts are now underway totaling about $7 million for construction of block 8 laterals and pumping plant and the block 8 power distribution system.

b. Dam Safety

Although not a part of CRSP activities, Reclamation is also providing technical assistance to the BIA and Navajo Nation for correction of deficiencies on 12 existing BIA dams. Modifications to Round Rock Dam were completed in 1994. The Ganado Dam modification contract was awarded by BIA on September 28, 1994, to Stimpel-Wiebelhaus Associates in the amount of $1 million, and the work was completed in 1995. Designs and specifications have been completed for the correction of deficiencies on Many Farms Dam, and the project is awaiting funding for construction.

5. Utah

a. Central Utah Project (CUP)

The CUP provides water for irrigation, M&I uses and power generation. Benefits are also being realized in the areas of outdoor recreation, fish and wildlife conservation, flood control, water quality control and area development. The initial phase consists of six units. The largest of these is the Bonneville Unit, which involves the diversion of water from the Uinta Basin, a part of the Colorado River Basin, to the Great Basin, with associated resource developments in both Basins. The other units, Vernal, Uintah, Upalco and Jensen, provide for local development in the Uinta Basin.

i. Bonneville Unit

Legislation introduced in 1991 by the Utah congressional delegation to increase the ceiling to allow completion of the Bonneville Unit of the CUP, primarily the irrigation and drainage system, was passed on October 30, 1992 as P.L. 102-575. The legislation allows the Central Utah Water Conservancy District (District) to plan and construct the irrigation and drainage system under the purview of the Department of the Interior. Reclamation and

the District have prioritized remaining work items to ensure that the most important work is accomplished first under the remaining ceiling. No work will be awarded if the completion of the work will cause the ceiling to be exceeded. Section 203 of P.L. 102-575 provides the District with the opportunity to construct the Uintah and Upalco Units of the CUP. The District is moving ahead with planning for the units and has prepared the Draft EIS for both units.

In January 1994, the Commissioner of Reclamation requested that the CUP Program Director enter into negotiations for a lease of power privilege with the District for the development of hydroelectric power at Bonneville Unit facilities and an agreement with the Strawberry Water Users Association (Association) for the development of hydroelectric power at Diamond Fork. Public negotiation sessions were held with the District and the Association, and a notice was published in the *Federal Register* in December of 1994 requesting proposals for development. Experts from Interior, Reclamation, the Western Area Power Administration, Bonneville Power Administration and Army Corps of Engineers evaluated the proposals and concluded that the District/Association joint proposal was best.

The next step toward negotiating a lease with the District/Association was to supplement the 1965 CUP repayment contract. These negotiations were completed by the Department of the Interior in 1996. The supplement has not yet been executed. Since two federal projects, the CUP and the Strawberry Valley Project (SVP), would be included in the lease, work is also proceeding to enter into a CUP/SVP operating agreement. Once these issues are completed, expected lease of power privilege negotiations will be reinitiated by the Department of the Interior.

6. Wyoming

a. Lyman Project

Under the Safety of Dams Program, a contract for construction of a concrete cutoff wall in Meeks Cabin Dam was awarded on July 26, 1993 to Bauer of America Corporation of Waltham, Massachusetts for $5.9 million. The cutoff wall was designed to reduce seepage through the dam and increase its safety. The work was completed in the fall of 1995.

7. New Mexico

a. San Juan Chama Project

A Resource Management Plan (RMP) initiated in 1995 for Heron Reservoir is scheduled for completion in late 1997. The RMP and environmental analysis are expected to provide a guide for future resource management decisions and identify problems, issues and opportunities at Heron Reservoir. Administrative review of the Draft Environmental Assessment is currently underway, with the document scheduled for public distribution and review in March 1997.

D. RECREATIONAL USE AT RESERVOIRS

The following estimated recreation visits occurred in 1995 (latest figures available) at the reservoirs listed below:

Reservoir	Year First Visited	1995
Curecanti (Aspinall)	1966	993,072
Currant Creek	1982	97,763
Crawford	1963	95,835
Flaming Gorge	1962	2,270,000
Fontenelle	1965	11,700
Heron	1973	75,206
Horsethief	1992	1,347
Huntington North	1967	58,264
Joes Valley	1967	99,190
Jordanelle	1994	450,000
Lake Powell	1962	2,538,684
Lemon	1964	33,000
McPhee	1985	181,800
Meeks Cabin	1973	9,200
Nambe Falls	1977	46,100
Navajo	1963	620,614
Paonia	1962	7,764
Red Fleet	1982	55,590
Ridgway	1989	504,352
Rifle Gap	1967	114,080
Silver Jack	1973	84,500
Starvation	1970	121,546
Stateline	1981	2,200
Steinaker	1962	74,880
Strawberry (enlargement)	1985	415,259
Upper Stillwater	1988	45,000
TOTAL		**9,006,946**

E. STATUS OF OTHER RECLAMATION PROJECTS IN THE UPPER COLORADO RIVER BASIN

1. Colorado

a. Fruitgrowers Dam Project

Reclamation entered into an agreement with the Audubon Society to manage the lands around Fruitgrowers Reservoir for wildlife habitat enhancement and viewing. A watchable wildlife trail and viewing area, accessible to persons with disabilities, has been constructed.

b. Uncompahgre Project

The AB Lateral Hydropower Facility (Project) would be funded, built and operated by the Uncompahgre Valley Water Users Association (UVWUA) and Montrose Partners. The Project would be constructed under a lease of power privilege (Lease) using existing features of Reclamation's Uncompahgre Project. Reclamation issued a Final EIS in 1990 for this non-federally funded project. The ROD, which was issued in 1991, provided that Reclamation would not execute a Lease permitting the Project until a Section 404 Permit was obtained. The Corps of Engineers denied the permit in 1993; the sponsors collected additional data, prepared new bank stabilization plans and submitted a new permit application. The Corps issued a public notice on the application in August 1995. In January 1997, the Corps of Engineers will provide the sponsors with a general outline of permit conditions. With this information, Reclamation can take the lead in updating the NEPA compliance documents for the project. This effort will begin in 1997 and will include public involvement and a supplemental NEPA document.

The proposed facility would use the existing Gunnison Diversion and Tunnel to divert water from the Gunnison River to an Uncompahgre River hydroplant. Environmental issues relate to Gunnison River reduced flows and Uncompahgre River increased flows. Downstream areas on the Gunnison River have been determined eligible for inclusion in the Wild and Scenic Rivers System. A segment of river is within the Black Canyon of the Gunnison National Monument. Reclamation and the National Park Service plan to sign a contract to establish a water supply for the Monument, and Reclamation is considering additional NEPA compliance in light of new bank stabilization plans and other new information before proceeding with the Lease allowing building of the facility.

The Uncompahgre Projects Office Building, built in 1905, is the oldest Reclamation-built projects office and is on the National Register of Historic Places. The UVWUA has occupied the building since 1932. The building has structural and roof problems, fire safety violations, inadequate accessibility, dangerous wiring and high utility bills. In 1991, the UVWUA requested permission from Reclamation to tear down the building and build a new structure entirely at its own cost.

The State Historic Preservation Officer and Advisory Council for Historic Preservation consider the building a very important resource, and they requested Reclamation to consider alternatives that would preserve the structure. A 1994 Draft Environmental Assessment considered alternatives ranging from rehabilitation to replacement (demolition).

In December 1995, Reclamation had made the decision to demolish the building, however, the State Historic Preservation Officer would not approve a Determination of Effect, thus elevating this to the National Advisory Council. The water users had approval for the use of State Historic Preservation Grant money for the rehabilitation. Reclamation is looking into participating with matching funding with the State grant money, with the water users providing in-kind services to rehabilitate and preserve this significant historic resource.

c. Dominquez Project (Whitewater)

As required by Section 204(l) of the Federal Land Policy and Management Act (P.L. 94-579), Reclamation completed a withdrawal review on lands withdrawn for the Dominquez Project. In December 1988, Reclamation submitted a report to BLM recommending that its withdrawal for this project, totaling approximately 28,444 acres, be terminated in its entirety. That recommendation has not yet been processed by BLM. In September 1996, the Interior Department's Inspector General completed an audit report entitled, "Withdrawn Lands, Department of the Interior." As a result of recommendations made in that audit report, it is anticipated that BLM will soon begin to clear a large backlog of unprocessed recommendations.

F. INVESTIGATIONS

The Upper Colorado Region General Investigations budget for fiscal year 1996 was about $2.8 million, with about 48 percent being directed within the Upper Colorado River Basin. About 22 percent of the General Investigations funds spent in the Basin were for salinity control activities including support of the Colorado River Storage System model, monitoring for program verification and evaluation, program coordination and other salinity control activities.

Other investigations include the Yampa River Water Supply Study, the Grand Valley Project Water Conservation Study and the Ashley/Brush Creeks Optimization Study. Under funds appropriated through a congressional write-in, Reclamation provided planning and technical assistance to the City of Gallup, New Mexico and the Navajo Nation on the San Juan River Gallup/Navajo Water Supply Study. Reclamation also continues to provide assistance, as requested, through its Technical Assistance to the States Program, and continues to coordinate with other natural resource agencies on critical water resource related problems and issues. Continuing this year is a program (Investigation of Existing Projects) for evaluating system optimization on some existing projects, with several projects scheduled for evaluation. Under the General Planning Studies account, Reclamation has some funding to participate in special studies requested by other natural resource agencies.

1. Colorado

a. Upper Gunnison-Uncompahgre Basin Study

In cooperation with the Colorado Department of Natural Resources and the Colorado River Water Conservation District (CRWCD), Reclamation developed a detailed hydrologic model and accounting system for the Gunnison River Basin. These products will be used by federal, State, and local entities to resolve federal reserved water rights,

Colorado River endangered fish species and other issues relating to Aspinall Unit operations. Technical work was accomplished by Reclamation and Hydrosphere Resources Inc. (under contract with the CRWCD). The model was completed in 1996 and is available from the Western Colorado Area Office - Northern Division.

b. Yampa River Water Supply Study

Reclamation began its participation in this study in fiscal year 1994. Other participants include the Colorado Water Conservation Board, the CRWCD, the City of Craig and the Colorado River Endangered Fishes Recovery Implementation Program. The purpose of the study was to conduct an investigation of the possible rehabilitation, enlargement and re-operation of Elkhead Creek Reservoir for the purposes of endangered species habitat enhancement and M&I water supplies for Yampa River Basin water users. The study was completed in fiscal year 1996, and copies of the final report are available from the Western Colorado Area Office - Northern Division.

c. Grand Valley Project Water Conservation Study

This study was initiated in fiscal year 1994 in cooperation with the Colorado Water Conservation Board, the CRWCD, Northern Colorado Water Conservancy District, Denver Water, the Fish and Wildlife Service and the Colorado River Endangered Fishes Recovery Implementation Program. The purpose of the study was to quantify water that can be salvaged from operational waste that is currently diverted by the Grand Valley Project and returned to the Colorado River through project wasteways. Alternative uses for the salvaged water are being identified, and implementation plans are being developed. The plans include economic, financial and environmental analyses and identify institutional constraints that need to be addressed. This study identified about 30,000 acre-feet of water that can be salvaged annually at an annual cost of only $12 per acre-foot. The study was completed in fiscal year 1996, and copies of the final report are available from the Western Colorado Area Office - Northern Division.

2. New Mexico

a. San Juan Gallup/Navajo Water Supply Study

This study is providing planning and technical assistance to the Navajo Nation and the City of Gallup, New Mexico to formulate a project to divert water from the San Juan River to augment domestic water supplies of rural Navajo communities on the eastern side of the reservation, the Cities of Gallup, New Mexico and Window Rock, Arizona. Existing groundwater supplies in the area are inadequate to meet expected future demands.

G. RESERVOIR OPERATIONS

1. 1996 Operations Summary and Reservoir Status

Water year 1996 commenced with above normal hydrologic conditions in the Basin. Basinwide precipitation during 1996 was above average and translated into an above average snowpack. At the beginning of the runoff season, the Basinwide snowpack was about 115 percent of average, varying between 149 percent of normal in the Upper Colorado River Basin and 65 percent of normal in the San Juan Basin. However, extremely dry conditions in the late spring reduced the runoff to near normal levels. Annual runoff in the Green River Basin was 103 percent of average, the Gunnison Basin was 117 percent of average, the San Juan Basin was 42 percent of average, and Lake Powell was 95 percent of average. With this runoff during 1996 there were some reports of local flooding, but most damage was minimal.

Unregulated inflow into Lake Powell was 10.978 million acre-feet (maf) in water year 1996, approximately 95 percent of average. This inflow resulted in the loss of approximately 0.908 maf of storage in Lake Powell. Approximately 0.533 maf of storage was lost in upstream reservoirs, approximately 0.809 maf of storage was gained in Lower Basin reservoirs, and the total Colorado River storage system lost approximately 0.631 maf during water year 1996. It is now estimated that with average inflow during 1997, the system will be relatively full. During 1996, all deliveries of water to meet obligations pursuant to the "Law of the River" were maintained. On July 24, 1996, the Regional Directors of the Upper and Lower Colorado Regions issued a revised determination for 1996 Colorado River water use, acting under authority from the Secretary of the Interior. This determination changed the finding of 1996 from a "normal" water year to that of a "surplus" water year, as defined in the 1970 Operating Criteria.

2. 1997 Reservoir Operations

Minimum instream flow levels and annual operating strategies have been established at several locations in the Upper and Lower Basins which are intended to protect the aquatic resources downstream of specific dams. The regulation of the Colorado River has had both positive and negative effects on aquatic resources. Controlled cool water releases from dams have provided for increased productivity of some aquatic resources and the development of significant sport fisheries. However, the same releases may be detrimental to endangered and other native species of fishes.

Consultations with the Fish and Wildlife Service in compliance with Section 7 of the Endangered Species Act (Section 7 consultations) on the operation of the Aspinall Unit on the Gunnison River, Navajo Dam on the San Juan River, and Flaming Gorge on the Green River will continue in 1997. Field studies associated with these consultations have been completed, and final reports will be prepared in 1997. These reports will be used to better understand the flow-related needs of endangered and other native fish species. Additionally, interim flow restrictions on releases from Lake Powell will continue in water year 1997 until Operating Criteria and an annual plan of operation are approved by the Secretary of the Interior.

Modifications to planned operations may be made based on changes in forecast conditions. However, due to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, Section 7 consultations and other downstream

concerns, modification to the monthly operation plans may not be based solely on changes in streamflow forecasts. Decisions on spring peak releases and downstream habitat target flows may be made midway through the runoff season. Reclamation and the Fish and Wildlife Service will initiate meetings with interested parties, including representatives of the Basin States, to facilitate the decisions necessary to finalize site-specific operations plans. All operations will be undertaken subject to the primary water storage and delivery requirements established by the "Law of the River" and other applicable statutes, including water quality control, recreation, enhancement of fish and wildlife and other environmental factors.

The following paragraphs discuss the operation of each of the reservoirs with respect to compact, decree and statutory water delivery obligations and instream flow needs for maintaining or improving aquatic resources, where appropriate.

a. Fontenelle Reservoir

The Upper Green River Basin experienced another above average year. The April through July runoff into the reservoir during water year 1996 was 1.051 maf, or 124 percent of the long-term average, and Fontenelle Reservoir easily filled in 1996.

Because the mean annual inflow of 1.229 maf far exceeds the storage capacity of 0.345 maf, significant powerplant bypasses are expected under the most probable and maximum probable inflow scenarios. Additionally, there is little chance that the reservoir will not fill during water year 1997. In order to minimize spring high releases and to maximize downstream fishery resources and power production, the reservoir will probably be drawn down to minimum pool elevation 6,463 feet which corresponds to a volume of 0.093 maf of live storage.

To meet the above-stated operational objectives, a constant release of approximately 1,100 to 1,200 cubic feet per second (cfs) will be made through the fall and winter months. Releases at this level will provide an appropriate level of reservoir drawdown for the 1997 runoff season, while ensuring that downstream water rights and M&I needs are met.

b. Flaming Gorge Reservoir

Water year 1996 unregulated inflow into Flaming Gorge Reservoir was 1.76 maf, or 103 percent of average. The April through July runoff was 1.28 maf, or 100 percent of the long-term average. With this inflow, Flaming Gorge lost approximately 0.104 maf of storage in water year 1996.

In 1996, Flaming Gorge was operated in accordance with the Biological Opinion on the Operation of Flaming Gorge (BOFG) issued in November 1992. The BOFG outlines the reservoir operations during the spring, summer, and early fall months which may provide an improved habitat for endangered endemic species of fish. In accord with the BOFG, maximum powerplant releases were made from Flaming Gorge Dam during May and June. The goal of the release in 1996 was to maintain releases from the dam at 4,400 cfs during the peak of the spring runoff of the Yampa River. Flows of the Green River at Jensen, Utah were expected to be between 18,000 to 22,000 cfs. Jensen is below the confluence of the Green and Yampa Rivers and flows from the Yampa River, in 1996 alone, exceeded 17,900 cfs, producing flows at Jensen of 22,300 cfs.

In water year 1997, high spring releases are again expected at Flaming Gorge. .Under all inflow scenarios, low stable flows between 1,100 and 1,800 cfs will most likely be maintained on the Green River near the Jensen, Utah, gaging station during the summer and fall months by adjusting Flaming Gorge releases. A revised biological opinion is expected to be issued from the Fish and Wildlife Service to Reclamation and the Western Area Power Administration in 1997. This revised opinion is scheduled to describe specific constraints during the spring and winter seasons, but will also refine the constraints for the entire year.

c. Blue Mesa, Morrow Point and Crystal Reservoirs (Aspinall Unit)

In water year 1996, the April through July unregulated runoff into Blue Mesa Reservoir was 0.830 maf, or 118 percent of average. Water year 1996 unregulated inflow was 1.137 maf, or 117 percent of average. Water year 1996 powerplant bypasses were approximately 0.284 maf at Crystal. Releases and spills up to 9,540 cfs occurred at Crystal with flows in the river below the tunnel in excess of 8,600 cfs. Blue Mesa Reservoir filled easily during water year 1996.

Section 7 consultation with the Fish and Wildlife Service on the operation of the Aspinall Unit continued in 1996. As part of this consultation, a five-year effort to study the effects of various release patterns on habitat, reproductive success, and reintroduction of endangered fish in the Gunnison River is underway and will be completed in 1997.

Additionally, the Aspinall Unit was operated as if the draft contract among Reclamation, the National Park Service, and the State of Colorado to deliver water from the Aspinall Unit to the Black Canyon of the Gunnison National Monument were in place. The operation was also coordinated with the Fish and Wildlife Service and others interested in the operation of the Aspinall Unit.

For water year 1997 operations, Blue Mesa Reservoir will be drawn down to at least an elevation of 7,490 feet by December 31, 1996 in order to minimize icing problems in the Gunnison River. Blue Mesa will continue to be drawn down through April 1997 to a level that will accommodate the current most probable inflow scenario and accomplish the release objectives with minimal powerplant bypasses at Crystal.

The minimum release objective of the Aspinall Unit is to meet the delivery requirements of the Uncompahgre Valley Project, to keep a minimum of 300 cfs flowing through the Black Canyon of the Gunnison National Monument and to maintain a minimum of 200 cfs below the diversion structure at Redlands (at the confluence of the Gunnison and Colorado Rivers). Under all three inflow scenarios, Blue Mesa is expected to fill in the summer of 1997, and flows through the Black Canyon of the Gunnison National Monument are expected to be above the minimum release objective during the summer months. Filling of the reservoir in water year 1997 will ensure that reasonable specific releases required to study the protection and improvement of habitat for endangered fish can be accommodated. The forecasted runoff for the spring of 1997 will be closely monitored to achieve these objectives. To protect both the blue ribbon trout fishery in the Black Canyon and recreation potential, releases during 1997 will be planned to minimize large fluctuations in the daily and monthly flows in the Gunnison River below the Uncompahgre Tunnel Diversion.

d. Navajo Reservoir

The April through July unregulated inflow into Navajo Reservoir in water year 1996 was 0.239 maf, or 35 percent of average. Water year 1996 unregulated inflow was 0.409 maf, or 42 percent of average. Navajo Reservoir did not fill in 1996.

Section 7 consultation with the Fish and Wildlife Service on the operation of Navajo Dam continued in 1996. Water year 1996 was the sixth year of a seven-year study to evaluate alternative operations of Navajo Reservoir to benefit endangered fish. In an attempt to monitor the aquatic impact of a low runoff year on the San Juan River, spring operations at Navajo were restricted to a maximum release of 2,500 cfs during June after the peak flows of the Animas River had passed. This resulted in peak flows of 4,000 cfs at Bluff, Utah. After the completion of the large spring releases, releases were gradually reduced to approximately 600 cfs for the remainder of the year.

During the fall-winter period of 1996-1997, flows from Navajo Dam were reduced to 250 cfs in an attempt to meet a requested research flow of approximately 650 cfs on the San Juan River below Shiprock. Data from the winter test flow will be used to help formulate year-round flow recommendations for an upcoming biological opinion on Navajo Dam operations in 1998. The experiment to reduce winter dam releases is an integral part of studies being conducted through the San Juan River Basin Recovery Implementation Program. The additional storage of water in the reservoir gained from lower winter flows will allow greater flexibility of releases in the spring to benefit downstream populations of endangered fish and allow for future water development. Both objectives are primary goals of the Recovery Program.

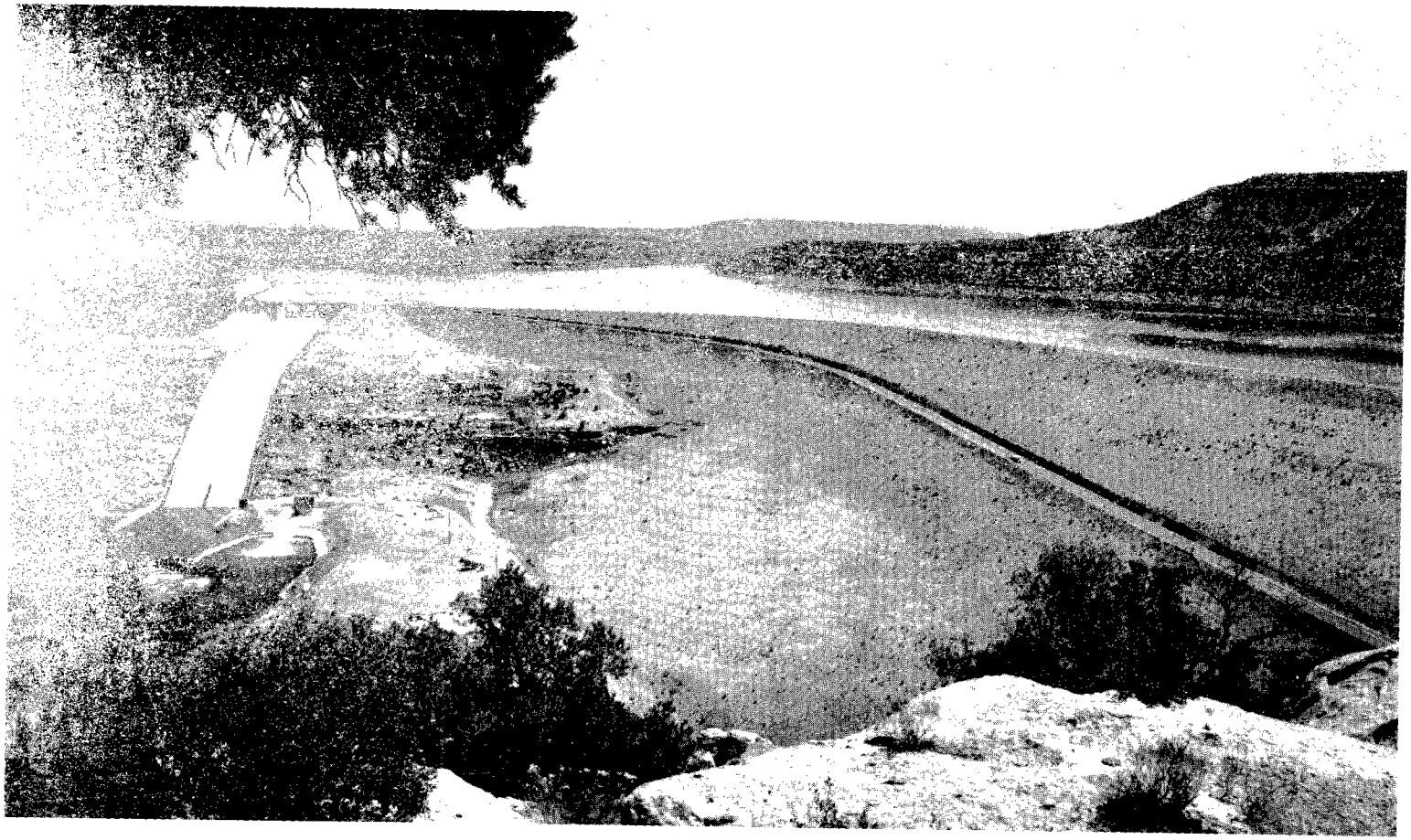
In 1997, Navajo Reservoir is expected to nearly fill except under the probable minimum inflow scenario. Releases from the reservoir will be held near 600 cfs through the fall and winter months, and large releases will likely be made in May and June in order to improve the habitat and provide better spawning conditions for endangered fish in the San Juan River.

e. Lake Powell

The April through July unregulated inflow into Lake Powell in water year 1996 was 7.3 maf, or 94 percent of average. Water year 1996 unregulated inflow was 10.978 maf, or 95 percent of average. Lake Powell ended the water year 19 feet from full.

During March and April 1996, a test of the beach/habitat building flow was conducted from Glen Canyon Dam. The test consisted of peak releases of 45,000 cfs which lasted seven days, preceded and followed by four-day periods of low steady flows to allow photographic mapping and monitoring of the canyon resources. While scientific understanding of the results of this test is not yet complete, data collected to date indicate that the test accomplished the goals of rebuilding sandbar deposits and reforming eddy backwaters.

This test was implemented following discussions among the Department of the Interior, the Basin States and key scientists and researchers which resulted in a long-term agreement for managing spills from Glen Canyon Dam. This agreement provides for the use of reservoir releases in excess of powerplant capacity required for dam safety purposes



Navajo Dam and Reservoir, San Juan River - New Mexico - Bureau of Reclamation Photo

during high reservoir conditions to accomplish the objectives of the beach/habitat building flow described in the Glen Canyon Dam EIS. Such releases would be consistent with the 1956 Colorado River Storage Project Act, the 1968 Colorado River Basin Project Act and the 1992 Grand Canyon Protection Act. Such releases would be managed to the maximum extent possible to (1) protect river sediment storage downstream or (2) be released in such a way as to reshape river topography, redeposit sediment, and enhance aquatic habitat. Pending completion of NEPA compliance, Reclamation also intends to reinstall the spillway gate extensions at Glen Canyon Dam to increase the flexibility of managing high runoff years.

During water year 1997, releases greater than the minimum release objective of 8.230 maf likely will be made to equalize the storage between Lakes Powell and Mead and/or to avoid anticipated spills. Under the most probable inflow conditions, releases of 9.940 maf would be made, and the reservoir would gain 0.477 maf of storage. Under the probable maximum inflow scenario, approximately 15.300 maf will be released during the water year and Lake Powell would gain 1.643 maf of storage. This maximum probable inflow would require releases of about 25,000 cfs for a lengthy period of time.

The interim flow restrictions on the daily and hourly releases from Glen Canyon Dam will continue during water year 1997. The ROD on the operation of Glen Canyon Dam was signed by the Secretary of the Interior on October 9, 1996, and a monitoring program has been implemented and will continue to measure the effects of interim flow restrictions on downstream resources.

3. 1997 Determinations

The Annual Operating Plan provides guidance regarding reservoir storage and release conditions during the upcoming year, based upon congressionally mandated storage, release and delivery criteria and determinations. After meeting these requirements, specific reservoir releases may be modified as forecast inflows change in response to climatic variability and to provide additional benefits to the projects' multiple purposes.

a. Upper Basin Reservoirs

The Operating Criteria provide that the annual plan of operation shall include a determination of the quantity of water considered necessary to be in Upper Basin storage at the end of the water year. Taking into consideration all relevant factors required by the Operating Criteria, it has been determined that the active storage in Upper Basin reservoirs forecast for September 30, 1997 exceeds the storage required under Section 602(a) of the Colorado River Basin Project Act under any reasonable range of assumptions which might be applied. Therefore, "602(a) Storage" is not the criterion controlling the release of water from Glen Canyon Dam during water year 1997.

Section 602(a)(3) of the Colorado River Basin Project Act provides for the storage of Colorado River water in Upper Basin reservoirs that the Secretary of the Interior finds necessary to assure deliveries to comply with Articles III(c) and III(d) of the 1922 Colorado River Compact, without impairment to the annual consumptive use in the Upper Basin. The Secretary of the Interior is required to make this determination after consultation with the Upper Colorado River Commission and representatives from the three Lower Division

States, and after taking into consideration all relevant factors including historic streamflows, the most critical period of record, the probabilities of water supply and estimated future depletions. Water not required to be so stored will be released from Lake Powell:

- to the extent it can be reasonably applied in the States of the Lower Division to the uses specified in Article III(e) of the 1922 Colorado River Compact, but these releases will not be made when the active storage in Lake Powell is less than the active storage in Lake Mead,

- to maintain, as nearly as practicable, active storage in Lake Mead equal to the active storage in Lake Powell, and

- to avoid anticipated spills from Lake Powell.

Storage equalization and/or spill avoidance criteria in accordance with Article II(3) of the Operating Criteria will control the releases from Glen Canyon Dam during water year 1997 unless the minimum objective release criterion in Article II(2) is controlling. Under the most probable inflow scenario, Glen Canyon Dam will release 10.169 maf.

b. Lower Basin Reservoirs

Water shall be released or pumped from Lake Mead to meet the following requirements:

(a) 1944 Mexican Water Treaty obligations,
(b) Reasonable beneficial consumptive use requirements of mainstream users in the Lower Division States,
(c) Net river losses,
(d) Net reservoir losses, and
(e) Regulatory wastes.

The Operating Criteria provide that after the commencement of delivery of mainstream water by means of the Central Arizona Project, the Secretary of the Interior will determine the extent to which the reasonable beneficial consumptive use requirement of mainstream users in the Lower Division States is met. The reasonable beneficial consumptive use requirements are met depending on whether a normal, surplus, or shortage condition has been determined. The normal condition is defined as annual pumping and release from Lake Mead sufficient to satisfy 7.500 maf of consumptive use in accordance with Article III(3)(a) of the Operating Criteria and Article II(B)(1) of the United States Supreme Court decree in *Arizona v. California*. The surplus condition is defined as annual pumping and release from Lake Mead sufficient to satisfy in excess of 7.500 maf of consumptive use in accordance with Article III(3)(b) of the Operating Criteria and Article II(B)(2) of the United States Supreme Court decree in *Arizona v. California*.

While there is no agreed upon surplus strategy, the most conservative strategy investigated in preparing the 1997 Annual Operating Plan concerned the utilization of additional water in reservoir storage resulting in the avoidance of flood control releases at the 30 percent exceedance probability of inflow to Lake Powell. This and other strategies seek to decrease the risk of flood control releases from Hoover Dam, which allows increased beneficial use of water in the United States. Possible impacts of a 1997 surplus determination were evaluated in terms of effects on reservoir elevations and releases and

increased risk of future shortages. This analysis showed that the 1997 surplus determination will cause neither significant effects on reservoir contents in Lakes Powell and Mead, nor significant additional risk of future shortages in Arizona.

The amount of additional mainstream water being made available during calendar year 1997 is limited to that quantity required to satisfy the reasonable beneficial consumptive use requirements of Colorado River mainstream water users in the Lower Division States with valid contracts or federal or decreed entitlements. The making of this determination does not preclude the Secretary of the Interior from adopting other determination criteria in future years. Furthermore, neither this determination nor the basis on which it was made constitutes a precedent for future determinations.

Taking into account (1) the existing water storage conditions in the Basin, (2) the most probable near-term water supply conditions in the Basin, and (3) that the beneficial consumptive use requirements of Colorado River mainstream users in the Lower Division States are expected to be more than 7.5 maf, the surplus condition is the criterion governing the operation of Lake Mead for calendar year 1997 in accordance with Article III(3)(b) of the Operating Criteria and Article II(B)(2) of the decree in *Arizona v. California.*

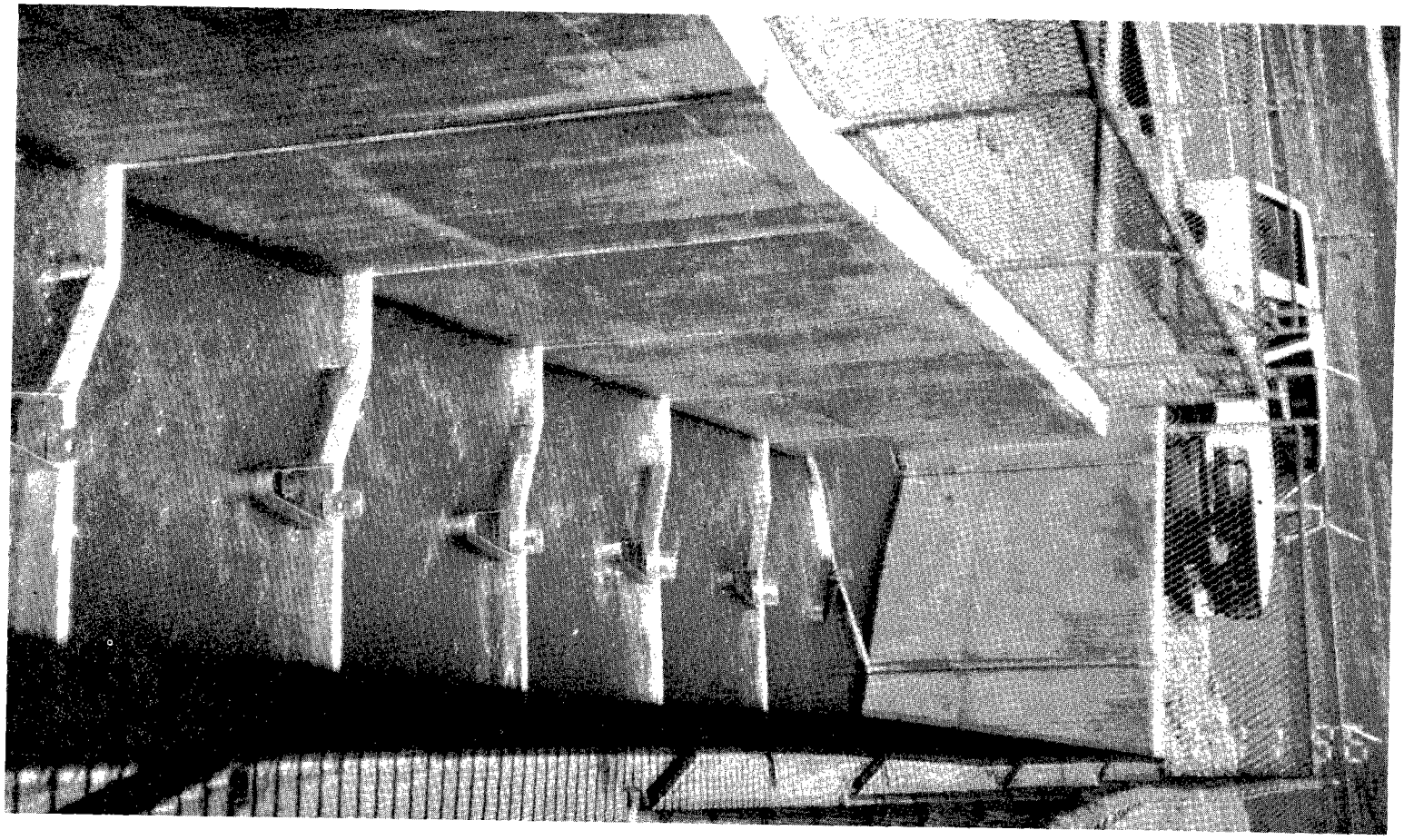
Nothing in the decree in *Arizona v. California* prohibits the Secretary of the Interior from releasing water apportioned, but unused, in any Lower Division State for that year for consumptive use in any other Lower Division State. No rights to the recurrent use of such water accrue by reason of the use of such water. In light of this provision, and in accordance with Article II(B)(6) of the decree, any Lower Division State will be allowed to utilize water apportioned to, but unused by, another Lower Division State in calendar year 1997.

H. FISH AND WILDLIFE

The Upper Colorado River Recovery Implementation Program (UC RIP) for endangered fish is in its seventh year of implementation. In fiscal year 1995, research projects funded totaled almost $3 million. In fiscal year 1996, capital projects totaling almost $10 million were initiated to accomplish physical habitat improvements.

Other UC RIP studies will be completed in 1997 on the Green River to monitor effects of the recommendations made in the 1992 Biological Opinion on the Operation of Flaming Gorge Reservoir and to refine those recommendations. The studies include a series of test flows designed to simulate a wide range of hydrologic conditions. Specific research on the effects of the operation of the Aspinall Unit will also be completed in 1997. Consultation on the operation of the Aspinall Unit is expected to be initiated in 1997. Efforts are still ongoing to acquire water rights for endangered fish on the Yampa River and 15-mile reach of the Colorado River from the confluence of the Gunnison River to the Grand Valley Diversion.

As a result of the 1991 Biological Opinion on the Animas-La Plata Project, the Secretary of the Interior signed a MOU with the States of Colorado, Utah and New Mexico and affected Native American Tribes for the development of a Recovery Implementation Program for the San Juan River. The goal of the San Juan River Recovery Implementation Program is to protect and recover the endangered fish in the San Juan River, while providing a consultation process for water development consistent with State and federal



Redlands Dam Fish Passage - Colorado

- Bureau of Reclamation Photo

laws. Reclamation and the BIA committed to fund research starting in fiscal year 1993 on the San Juan River as a condition of the reasonable and prudent alternative for the Animas-La Plata Project opinion, and for blocks 7 and 8 of the Navajo Indian Irrigation Project. Reclamation and the Fish and Wildlife Service underwent further consultation on the Animas-La Plata Project due to new information and the designation of critical habitat for endangered fishes in the Colorado River system, including the San Juan River. A new biological opinion was issued by the Fish and Wildlife Service in February 1996.

As part of the research being conducted on the San Juan River, Reclamation conducted a two-week test of low winter flows from Navajo Dam in January 1996. Information collected was used to plan a four-month low-flow test conducted during the winter of 1996-1997. Flow recommendations from testing will be the basis of another Fish and Wildlife Service biological opinion, in compliance with the Endangered Species Act, for the long-term operation of Navajo Dam. After the biological opinion is issued, Reclamation will prepare a document to comply with NEPA. This document will address the long-term environmental consequences of future operations in the context of expected increasing demands for water in the San Juan River Basin.

I. APPROPRIATIONS OF FUNDS BY THE UNITED STATES CONGRESS

The funds appropriated for fiscal year 1996 for construction of the CRSP, participating projects and recreational and fish and wildlife activities totaled $28,949,000. Fish and wildlife activities received a total of $1,920,000.

In addition, under the Colorado River Basin Salinity Control Program, $5,799,000 were appropriated for the Grand Valley Unit, $300,000 for the Paradox Valley Unit, $1,231,000 for Stage 1 of the Lower Gunnison Unit, and $500,000 for the Basinwide program.

Table 6, page 65, illustrates a general recapitulation of action by the 104th Congress pertaining to appropriations of funds for the construction program of the CRSP and participating projects.

Table 7, page 66, shows the total funds approved by the United States Congress for the CRSP and participating projects and chargeable against the limitations of various authorizing Acts (P.L. 485, 84th Congress, Colorado River Storage Project Act, as amended in 1972 by P.L. 32-370 and in 1988 by P.L. 100-563; P.L. 87-485, San Juan-Chama and Navajo Indian Irrigation Projects Act; P.L. 88-568, Savery-Pot Hook, Bostwick Park, and Fruitland Mesa Projects Act; and P.L. 90-537, Colorado River Basin Project Act).

TABLE 6
COLORADO RIVER STORAGE PROJECT
FISCAL YEAR 1997 PROGRAM

Project and State	Budget Estimate	House Allowance	Senate Allowance	P.L. 104-206 Sept. 30, 1996
Construction Program				
CRSP Participating Projects:				
Animas-La Plata - Colorado	$9,500,000	-0-	$9,500,000	$8,500,000
Central Utah Project - Utah				
Bonneville Unit	7,495,000	7,495,000	7,495,000	7,495,000
Dolores Project - Colorado	6,115,000	6,115,000	6,115,000	6,115,000
	$23,110,000	$13,610,000	$23,110,000	$22,110,000
TOTAL - Upper Colorado River Basin Fund	$23,410,000	$13,910,000	$23,410,000	$22,410,000
Recreational and Fish and Wildlife Facilities:				
Recreational Facilities	-0-	-0-	-0-	-0-
Fish and Wildlife Facilities	2,440,000	1,940,000	2,440,000	2,440,000
	$2,440,000	$1,940,000	$2,440,000	$2,440,000
TOTAL - Colorado River Storage Project	$25,850,000	$15,850,000	$25,850,000	$24,850,000

TABLE 7

APPROPRIATIONS BY CONGRESS
FOR THE
COLORADO RIVER STORAGE PROJECT AND
PARTICIPATING PROJECTS

Fiscal Year	Amount
1957	$ 13,000,000
1958	35,142,000
1959	68,033,335
1960	74,459,775
1961	58,700,000
1962	52,534,500
1963	108,576,000
1964	94,036,700
1965	55,800,000
1966	45,328,000
1967	46,648,000
1968	39,600,000
1969	27,700,000
1970	25,740,000
1971	24,230,000
1972	27,284,000
1973	45,770,000
1974	24,426,000
1975	22,967,000
1976	38,160,000
Transition Quarter (July, August, September 1976)	15,562,000
1977	55,200,000
1978	67,051,000
1979	76,799,000
1980	81,502,000
1981	125,686,000
1982	130,063,000
1983	132,942,000
1984	161,104,000
1985	163,503,000
1986	97,412,000
1987	110,929,000
1988	143,143,000
1989	174,005,000
1990	163,653,000
1991	145,063,000
1992	92,093,000
1993	69,333,000
1994	46,507,000
1995	23,272,000
1996	27,049,000
1997	22,410,000
TOTAL	$3,052,416,310
Plus: Navajo Indian Irrigation Project Appropriations	$397,967,494
TOTAL APPROPRIATIONS	$3,450,383,804

Exclusive of non-reimbursable funds for fish and wildlife, recreation, etc., under Section 8 of P. L. 485, 84th Congress.

COLORADO RIVER BASIN
SALINITY CONTROL PROGRAM

(Information relative to the Colorado River Basin Salinity Control Program in the Colorado River Basin has been obtained from the United States Department of the Interior, Bureaus of Reclamation and Land Management, and the United States Department of Agriculture (USDA), Natural Resources Conservation Service.)

Title II of the Colorado River Basin Salinity Control Act, Public Law 93-320 (approved June 24, 1974), directs the Secretary of the Interior to expedite the investigation, planning and implementation of the salinity control program. The program objective is to treat salinity as a Basin-wide problem in order to maintain salinity concentrations at or below 1972 levels in the lower main stem of the river while the Basin States continue to develop their compact-apportioned waters. Specifically, the Act authorizes the construction, operation and maintenance of four salinity control projects (Paradox Valley, Grand Valley, Las Vegas Wash and Crystal Geyser Units) and the expeditious completion of planning reports for 12 other projects. It also requires cost-sharing by non-Federal entities. The Secretary of the Interior, Secretary of Agriculture and Administrator of the EPA are directed to cooperate and coordinate their activities to meet the program objectives.

Public Law 98-569, signed into law on October 30, 1984, amends Public Law 93-320. This law amends the original salinity control program by authorizing construction of additional units by Reclamation and deauthorizing Crystal Geyser because of poor cost effectiveness. The Secretary of Agriculture is directed to establish a major voluntary onfarm cooperative salinity control program. The authorizing legislation provides for cost-sharing and technical assistance to participants for planning and installing needed salinity reduction practices, including voluntary replacement of incidental fish and wildlife values foregone. Participants pay at least 30 percent of the costs to install salinity reduction and wildlife habitat practices. Public Law 98-569 also directs that the BLM develop a comprehensive program for minimizing salt contributions from the 48 million acres of Basin lands that it administers.

Public Law 104-20 was signed into law on July 28, 1995. This law amends the Salinity Act to authorize a new approach to salinity control for Reclamation. Past authorities were unit specific. This amendment authorized Reclamation to pursue salinity control anywhere in the Basin. The amendment also increases Reclamation's appropriation ceiling by $75,000,000 to continue its ongoing efforts to control salinity. The Basin-wide program will request proposals from the public in 1996, rank the proposals based on cost and performance risk factors and fund the most highly ranked projects. Awards are scheduled for next fall.

The Federal Agriculture Improvement and Reform Act of 1996 (Public Law 104-127) was signed into law on April 4, 1996. This Act combines the Department of Agriculture's salinity control program and other programs into the Environmental Quality Incentives Program (EQIP). The Act further amends the Salinity Control Act to authorize the Secretary of the Interior the option to expend funds available in the Basin Fund to carry out cost-shared salinity measures consistent with the 30-percent allocation authorized by P.L. 98-569. This cost-sharing option is available for both the USDA and Reclamation programs.

A. PROGRAM STATUS

1. Bureau of Land Management Salinity Control Program

The July 1987 Report to Congress, "Salinity Control on BLM-Administered Public Lands in the Colorado River Basin," addresses the extent of salt contributed from public lands, current actions and future recommendations to achieve the objective of minimizing salinity contributions while recognizing multiple-use objectives and authorized uses.

During 1991, BLM established a salinity strategy for future project funding and implementation beginning in 1994. The strategy provisions include:

Phase I - ranking of watersheds in the Colorado River Basin by interagency teams.

Phase II - reconnaissance plans of watersheds by interagency multi-disciplinary teams who determine which areas have the best potential for improvement. This phase uses Pacific Southwest Interagency Committee (PSIAC) procedures to determine the physical feasibility of potential treatments.

Phase III - comprehensive plans will use the Revised Universal Soil Loss Equation (RUSLE) to estimate soil erosion. Planning will involve all users and interested publics to ensure coordination and implementation; economic analysis is based upon cost-effectiveness and is comparable with Reclamation and USDA procedures.

Phase IV - implementation will be accomplished as rapidly as funding is available.

Phase V - maintenance will assure continued functioning of treatments.

Phase VI - monitoring will be designed for efficient and effective progress evaluations and quantified to assure assumptions used in planning were correct and realistic.

During 1995, the BLM worked in cooperation with the Natural Resources Conservation Service (NRCS), the Arizona Department of Environmental Quality (DEQ) and the Arizona Department of Water Resources to complete identification of high-priority watersheds where management could significantly decrease salt yields. With the assistance of the DEQ, 84 watersheds were digitized and entered into a Global Information System, together with soil salinity and other key resource themes. The final 30 watersheds (nearly half of which involve tribal lands) were ranked for salinity control feasibility.

Off-Highway Vehicle (OHV) plans have been implemented on the Glenwood Springs, White River and Grand Junction Resource Areas to reduce movement of saline sediments. Gully plug construction and a shift in grazing practices at White Face Butte are expected to create salt savings. Colorado's Dry Creek Basin Coordinated Resource Management Plan was completed and funded by a grant to the local soil and water conservation district from the EPA. Dry Creek, the highest contributor of salinity to the San Miguel, should experience decreases in total dissolved solids with implementation of the plan. Landowners would participate through the San Miguel Soil Conservation District Board. Also cooperating with BLM are the Colorado Division of Wildlife, Colorado State University Extension, the NRCS and the Board of Land Commissioners.

In the San Juan Basin, the BLM has cooperated, financially and technically speaking, with the U.S. Geological Survey (USGS) and the Aneth Interagency Technical Committee during 1995. The USGS has assisted BLM in southern Nevada, through collection of hydrologic and water-quality information, on Las Vegas and Meadow Valley Washes and at Muddy River. A final report describing water and salt budgets was distributed in 1995.

Most of the Vernal District's efforts were centered on the Monument Butte Oil Field, in the form of private oil and gas company mitigation. In southern Utah, BLM performed fire rehabilitation and seeding on areas recently burned, for modest salt savings. The BLM also monitored at three locations in Sagers Wash for precipitation, runoff, sediment and salt yield.

The BLM continued implementing measures in the Red Creek Watershed of the Wyoming Green River Basin. A mile of two-track road was upgraded and drainage improved. Roads have been a major source of sediment in Red Creek. Union Pacific Resources worked with the BLM to complete five miles of road maintenance north of Rock Springs. This maintenance will reduce sediment movement along ditches and the clogging of culverts.

The BLM has all the necessary pieces in place in order to proceed with implementation of ecosystem management. The concept of ecosystem management recognizes that natural systems must be sustained in order to meet the social and economic needs of future generations. This concept is based on the integration of ecological, economic and social principles for the management of biological systems so that long-term ecological sustainability is safeguarded. The primary goal of BLM in ecosystem management is to develop management strategies that maintain and restore the ecological integrity, productivity, and biological diversity of public lands. Among other things, BLM expects that sustainable ecosystems will provide clean water, productive wildlife habitat and improved recreational and economic opportunities. Ecosystem management provides a comprehensive and powerful framework for meeting the salinity control goals in the Colorado River Basin.

2. Bureau of Reclamation and U. S. Department of Agriculture Salinity Control Program General Investigations and Construction

a. Big Sandy River Unit

Studies have been completed by Reclamation recommending only onfarm improvements. Canal and lateral lining were found to be prohibitively expensive. Most observation wells and monitoring stations have been closed or turned over to the USDA.

USDA funding for salinity control contracts has been available in the Big Sandy River Unit since 1988. The salinity control program in this area focuses on assisting farmers to convert inefficient surface irrigation systems to low-pressure sprinklers. Surface irrigation improvements are being applied on a small portion of the area. As of September 30, 1996, a total of 101 salinity control contracts have been signed by farmers. Participants have installed 78 low-pressure sprinkler systems and 29 miles of underground pipeline and gated pipe. Three surface irrigation systems have been improved on 56 acres. Wildlife

habitat practices are also being applied. The annual salt-load reduction achieved to date is 25,454 tons.

b. Colorado River Simulation System (CRSS)

The CRSS is used to evaluate the impacts of present and future water development in the Basin. Data are collected on flows, quality and water use throughout the Basin to determine, among other things, salinity effects. The CRSS is also used to evaluate compliance with the salinity standards, both present and future. Salinity funds are used to support the data collection, data analysis and model development.

c. Dolores/McElmo Creek Unit

In 1984, Public Law 98-569 authorized integration of the McElmo Creek salinity features into the Dolores Project. The plan combined existing canals into the new Towaoc-Highline Canal (a Dolores Project feature), lined existing non-project canals and replaced a non-project canal and open lateral system with a pipe lateral system. All salinity features are complete.

USDA initiated implementation in this unit in 1990. As of September 30, 1995, 216 salinity control contracts have been signed with farmers. In this unit, surface irrigation systems are being converted to predominately side-roll sprinkler systems. Where feasible, gravity pressure systems are installed. To date, 221 sprinkler systems and 111 miles of underground and gated pipe have been installed. In addition, 65 surface irrigation systems have been improved. The annual salt-load reduction achieved is 12,198 tons. Close coordination of the onfarm salinity control actions with the Reclamation canal and lateral construction program continues.

d. Glenwood-Dotsero Springs Unit

This unit would desalt saline springs through a cooperative agreement with the Glenwood Salt Company at a cost of $97 per ton for up to 73,000 tons per year. The project sponsor was not able to meet the performance terms of the cooperative agreement. The agreement has been terminated.

e. Grand Valley Unit

This unit was authorized by Public Law 93-320 in 1974 to reduce delivery-system seepage by lining canals and placing laterals into pipe. Stage I of the unit has been completed. Stage II of the unit was originally divided into over 20 increments, most of which have been deferred indefinitely due to poor cost effectiveness. Of the remaining cost-effective increments, the West End Canal and laterals have been completed. Construction of the Middle Government, Price and Stubb laterals continues. Construction of Reach 1b has been completed. Construction of Reach 1a will be deferred due to poor cost effectiveness and insufficient construction ceiling. All five increments organized under the Grand Valley Irrigation Company have been deferred due to a stockholder vote against participation in the program. The project is scheduled for completion in 1998.

USDA salinity control actions were initiated in the Grand Valley in 1979 under existing authorities. In 1987, funding became available for implementation under the USDA Colorado River Salinity Control Program. In this unit, the emphasis is on improvement of

surface irrigation systems and conversion to drip and microjet irrigation on vineyards and orchards. As of September 30, 1996, 532 miles of underground pipelines, gated pipe and concrete-lined ditch have been installed; 5,262 acres of land have also been leveled. Installation of surge irrigation systems is rapidly increasing. This method of irrigation has proven to be a very cost-effective way to reduce salt loading. In addition, wildlife habitat practices are being applied. Technical assistance is provided to all participants on irrigation water management. The annual salt-load reduction achieved is 70,600 tons.

f. Lower Gunnison Basin Unit

In 1984, Public Law 98-569 authorized the implementation of Stage I of the unit. Stage I consists of two parts: (1) a plan to eliminate winter stock watering from the canal system and (2) selective lining of the canal and lateral system. Both improvements would reduce seepage from the delivery system.

Winter Water - Most of the facilities were completed in 1995. The winter water facilities eliminate about 39,000 tons per year of salt loading from the river by eliminating winter stockwatering from the canal system and replacing it with domestic water service. The cost effectiveness of this portion of the project is $56 per ton.

East Side Laterals - Extensive work with the water users to restructure construction management, eliminate O&M payments by the government, selectively implement only the most cost-effective portions of the plan, and combine and straighten the alignments of the lateral-lining program has reduced its estimated cost from $147 to about $70 per ton of salt removed. This work will compete for funding within Reclamation's new program.

Implementation of the USDA salinity control program began in 1988. As of September 30, 1996, 354 contracts have been signed by participants. Salinity control measures in this unit focus on improving surface irrigation systems by land leveling, lining or placing earthen laterals and onfarm ditches in pipelines, and installing surge irrigation systems. Since the program was initiated, 258 miles of pipelines, concrete-lined ditch, and gated pipe have been installed. In addition, 623 surface irrigation systems have been improved and 60 sprinkler systems installed. Installation of surge irrigation systems is rapidly increasing. Microjet, drip and other specially-designed systems are being installed on orchards, vineyards, and vegetable crops. The application of wildlife habitat practices is on schedule. A salt-load reduction of approximately 33,942 tons per year has been achieved.

g. Navajo Indian Well Plugging

This proposal was received in response to Reclamation's request for proposals under its new program authorities. Reclamation is negotiating a cooperative agreement for the tribe to plug 5 wells on Navajo lands that contribute salt to the river system.

h. Paradox Valley Unit

This unit was authorized by Public Law 93-320 in 1974 to intercept natural saline springs that surface in the Dolores River channel. The springs are approximately 100 times more saline (260,000 mg/L) than irrigation return flows. The original plan was to evaporate the saline spring water using a surface reservoir once it was collected. However, due to

EPA objections, this plan was modified to provide for disposal of the brine through deep-well injection.

After drilling the injection well (16,000 feet) and testing the receiving formation, chemical compatibility problems were discovered (at depth). The Paradox brine will be diluted with fresh water to control this problem. A treatment process is being investigated. Laboratory tests indicate that the process works. A pilot test of the process is scheduled for 1996.

Fiscal year 1995 funds were used to complete the deep-well injection test. Results obtained indicate that the injection zone is physically capable of receiving brine for at least 10 years. The test pumps were replaced with continuous service pumps in 1996. The facility has been operating at about 50-percent capacity during the shakedown period for the new pumps. Normal operations should begin in 1997.

i. Price-San Rafael Rivers Unit

This unit would remove up to 161,000 tons of salt per year at $39 per ton in a cooperative irrigation improvement program with USDA and local irrigators. Over 50 percent of the onfarm program would be cost-shared by non-Federal entities in recognition of local benefits. The plan calls for Reclamation to combine laterals into a closed pipe to create a pressurized system for USDA to tap for sprinkler irrigation. The program would greatly reduce subsurface irrigation return flows, improving salinity. The plan also includes elimination of winter water stockwatering from the canal and lateral system. Several cooperative agreements are being negotiated to implement portions of this project under Reclamation's new program.

j. San Juan River Unit

The Hammond Area portion of the unit would remove 27,700 tons of salt per year at a cost of $42 per ton through a canal lining program on selected portions of the Hammond Project, a Reclamation project. A Planning Report/Environmental Assessment/Finding of No Significant Impact has been completed. A cooperative agreement has been awarded to the district to begin implementation of this project under Reclamation's new program.

A USDA salinity investigation has been completed on irrigated lands along the San Juan River in New Mexico from the vicinity of Fruitland, westward to Cudei. This area, consisting of about 8,400 irrigated acres, lies within the boundaries of the Navajo Nation. Findings from the investigation were published in a verification report in July 1993. The findings indicate that irrigation in the unit is contributing to increased salt loading of the San Juan River which ultimately flows into the Colorado River. It is recommended that the unit be studied further to produce an irrigation plan that will reduce irrigation return flow and salt loading to the San Juan River. No progress was made in fiscal year 1995 on any planning activities in this potential project due to uncertainty of future funding of the USDA program.

k. Uintah Basin Unit

This unit would remove 25,500 tons of salt per year at a cost of $88 per ton through selective lining of existing canals and laterals on private and Indian lands in the Uinta Basin.

A final Planning Report/EIS has been completed and filed. This unit may compete for funding from Reclamation's new program.

The USDA program has been underway in the Uinta Basin since 1980 when implementation was initiated under existing USDA authorities. Funding under the USDA salinity control program began in 1987. As of September 30, 1996, a total of 1,984 salinity contracts and Agriculture Conservation Program salinity and long-term agreements have been signed with participants. In this unit, the program focuses on assisting farmers to convert inefficient surface irrigation systems to sprinklers and replace earthen laterals and ditches with pipelines to reduce seepage. A high priority is given to working with groups of farmers where replacement of inefficient earthen laterals with pipelines will develop gravity pressure for onfarm sprinkler systems. To date, 813 miles of pipeline have been installed and 1,733 sprinkler systems have been applied on 86,367 acres. Irrigation water management is being applied on 72,932 acres. Participants are also installing wildlife habitat practices. The annual salt-load reduction achieved since the program started is 86,367 tons.

I. Las Vegas Wash Unit

Reclamation has discontinued efforts to develop and implement further salt reduction strategies for the Las Vegas Wash Unit. A strategy is apparently not available at this time that is cost effective, technically feasible and publicly acceptable. A final report was published in September of 1989. Quarterly water quality monitoring is continuing.

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.

ACKNOWLEDGEMENTS

The Upper Colorado River Commission wishes to thank the Governors of Colorado, New Mexico, Utah and Wyoming 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 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, Bureau of Land Management, Geological Survey, Fish and Wildlife Service, Bureau of Indian Affairs, Western Area Power Administration, the National Weather Service and the Department of Agriculture.

The diligent devotion to duty by departments of health and environment, water pollution control commissions, and counterpart organizations of the Upper Division States in aiding in the resolution of pollution and salinity problems of the Upper Colorado River System deserves special commendation.

Special recognition and appreciation is due to the Colorado River Basin Salinity Control Forum, several of whose members are advisers closely associated with the Commission, for the excellent work accomplished on the difficult salinity problems of the Colorado River.

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.

APPENDIX A

UPPER COLORADO RIVER COMMISSION

REPORT OF INDEPENDENT AUDITOR
AND
FINANCIAL STATEMENTS

June 30, 1996

UPPER COLORADO RIVER COMMISSION

ANNUAL FINANCIAL REPORT
June 30, 1996

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INDEPENDENT AUDITORS' REPORT

The Commissioners of the
Upper Colorado River Commission
Salt Lake City, Utah

We have audited the accompanying general purpose financial statements of the Upper Colorado River Commission as of and for the year ended of June 30, 1996 These general purpose financial statements are the responsibility of the Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the general purpose financial statements referred to above present fairly, in all material respects, the financial position of the Upper Colorado River Commission, as of June 30, 1996, and the results of its operations and changes in fund balance for the year then ended in conformity with generally accepted accounting principles.

Our audit was made for the purpose of forming and opinion on the general purpose financial statements taken as a whole. The supplemental schedule of cash receipts and disbursements - general fund and the supplemental schedule of expenses - budget and actual, are presented for purposes of additional analysis and are not a required part of the general purpose financial statements of the Upper Colorado River Commission. Such information has been subjected to the auditing procedures applied in the audit of the general purpose financial statements and, in our opinion, is fairly stated in all material respects in relation to the general purpose financial statements taken as a whole.

Ulrich & Associates, P.C.

July 23, 1996

UPPER COLORADO RIVER COMMISSION
Combined Balance Sheet
June 30, 1996

With Comparative Totals for June 30, 1995

	Governmental Fund Type	Account Group		Totals (Memorandum Only)	
	General	General Fixed Assets	General Long-Term Debt	1996	1995
ASSETS					
Petty cash	$ 25	-	-	25	25
Cash in bank	79,589	-	-	79,589	58,473
Certificates of deposit	93,500	-	-	93,500	145,287
Interest receivable	2,853	-	-	2,853	7,129
Receivable - other	261	-	-	261	-
Property and equipment:					
Land and land improvements	-	26,366	-	26,366	26,366
Building	-	56,919	-	56,919	56,919
Furniture and fixtures	-	52,487	-	52,487	51,863
Engineering equipment	-	1,411	-	1,411	1,411
Upper colorado river basin relief model	-	5,938	-	5,938	5,938
Amount to be provided for payment of compensated absences	-	-	7,664	7,664	8,153
Total assets	$ 176,228	143,121	7,664	327,013	361,564
LIABILITIES AND FUND EQUITY					
Liabilities:					
Accounts payable	$ 1,210	-	-	1,210	276
Prepaid assessment	-	-	-	-	36,070
Obligation for compensated absences	7,541	-	7,664	15,205	15,694
Total liabilities	8,751	-	7,664	16,415	52,040
Fund equity:					
Investment in general fixed assets	-	143,121	-	143,121	142,497
Fund balance	167,477	-	-	167,477	167,027
Total fund equity	167,477	143,121	-	310,598	309,524
Total liabilities and fund equity	$ 176,228	143,121	7,664	327,013	361,564

See accompanying notes to financial statements.

UPPER COLORADO RIVER COMMISSION
General Fund
Statement of Revenues, Expenditures and Changes in Fund Balance – Budget and Actual

Year ended June 30, 1996

	Budget	Actual	Favorable (Unfavorable) Variance
Revenues:			
Assessments	$ 257,600	257,600	-
Interest	-	15,847	15,847
Other	-	3,350	3,350
Total revenues	257,600	276,797	19,197
Expenditures:			
Personal services	238,000	236,102	1,898
Travel	15,500	13,961	1,539
Current operating expenditures	26,000	25,660	340
Capital outlay	500	624	(124)
Contingencies	5,000	-	5,000
Total expenses	285,000	276,347	8,653
Excess of revenues over (under) expenditures	(27,400)	450	27,850
Fund balance, June 30, 1995	167,027	167,027	-
Fund balance, June 30, 1996	$ 139,627	167,477	27,850

See accompanying notes to financial statements

(1) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

History and Activities

The Upper Colorado River Commission was formed pursuant to the terms of the Upper Colorado River Basin Compact on October 11, 1948, and consented to by the Congress of the United States of America by Act on April 6, 1949, as an administrative agency representing the Upper Division States of the Colorado Basin, namely Colorado, New Mexico, Utah and Wyoming. The Commission consists of one commissioner representing each of the four states and one representing the United States of America. The activities of the Commission are conducted for the purpose of promoting and securing agricultural and industrial development of the Upper Basin's water resources.

The Commission is the reporting entity and it approves the budget. The Commission hires a director and other personnel to administer the day-to-day activities of the Commission.

The Commission is exempt from Federal income taxes under provisions of Section 501(c)(1) of the Internal Revenue Code. The Commission is also exempt from state income taxes.

Basis of Accounting

The financial statements are presented on the modified accrual basis of accounting. Under the modified accrual basis of accounting, expenditures are recorded at the time liabilities are incurred. Revenues are recognized as received except for revenue susceptible to accrual and revenues of a material amount that have not been received at the normal time of receipt. Revenues susceptible to accrual are those that are both measurable and available to finance the Commission's operations during the year.

Budgets and Budgetary Accounting

Annual budgets are prepared on the modified accrual basis of accounting and adopted as required by law. The Commission approves the annual budget in total and by major sub-items as identified in the statement of revenues, expenditures and changes in fund balance - budget and actual. The Executive Director has authority to transfer budget accounts within the sub-items with Commissioner approval required to transfer monies between expenditure categories. The budget amounts shown in the financial statements are the final authorized amounts as revised during the year.

(1) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONT.)

Assessments

The Commission's major source of revenue consists of assessments levied against the four states and apportioned among them on the basis of the formula contained in the Upper Colorado River Basin Compact.

Property and Equipment

Property and equipment is recorded as capital outlay in the general fund at time of purchase and capitalized at cost in the general fixed assets account group. Cost of maintenance, repairs and minor renewals are expensed as incurred. When assets are retired or otherwise disposed of, the related cost is removed from the accounts. No provision for depreciation is provided on assets in the general fixed assets account group.

Compensated Absences

According to Commission policy each employee accrues annual leave based on years of service with the commission. Employees may accumulate a maximum of 30 days of unused annual leave, which is paid in cash upon termination of employment. The Commission's secretary may grant additional carryover to employees provided that: (1) the employee requests the carryover in writing prior to June 30, and (2) the employee uses the additional carryover within 90 days of the start of the fiscal year.

The Obligation for Compensated Absences has been broken down into two components; current and non-current. The current portion is classified as part of the general fund and is an estimate of the amounts that will be paid within the next operating year. The non-current portion is classified as part of the General Long-Term Debt Account Group because the obligation is not expected to be paid from spendable available resources within the next operating year.

Total Column on the Combined Statements

The total column on the combined statement is captioned "Memorandum Only" to indicate that it is presented only to facilitate financial analysis. The data in this column does not present financial position in conformity with generally accepted accounting principles. Neither is such data comparable to a consolidation.

(2) CERTIFICATES OF DEPOSIT AND CASH

Time certificates of deposit held at three different banks at June 30, 1996 consisted of the following:

	Amount	Maturity Date
6.25% certificate	$ 93,500	January 11, 1997

The Commissioners have authorized the Commission to deposit funds in demand accounts at the First Security Bank of Utah and purchase time certificates of deposit at any United States bank only to the extent the deposits are covered by Federal Depository Insurance.

At year end, the carrying amount of the Commission's cash deposits and certificates was $173,114 and the balance per the bank statements was $181,308. All deposits as well as certificates are fully insured.

(3) CHANGES IN INVESTMENT IN GENERAL FIXED ASSETS

Changes in the components of general fixed assets are as follows:

	Fixed Assets July 1, 1995	Additions	Retirements and Disposal	Fixed Assets June 30, 1996
Land and Land improvements	$ 26,366	-	-	26,366
Building	56,919	-	-	56,919
Furniture and fixtures	51,863	624	-	52,487
Engineering equipment	1,411	-	-	1,411
Upper Colorado River Basin relief model	5,938	-	-	5,938
	$ 142,497	624	-	143,121

(4) OTHER INCOME

Other income consisted of the following at June 30, 1996:

Waternews Subscription fees	$ 1,650
Legal Reference Sales	700
Gain on Sale of Assets	1,000
	$ 3,350

(5) PENSION PLAN

The Commission's employee pension plan is a 401(K) defined contribution plan which covers all of the present employees. The Commission contributes 7% of the employees' gross salaries. In addition, the Commission will match contributions made by employees up to a maximum of 3%. Accordingly, the maximum allowable contribution by the Commission is 10%. The employees are allowed to contribute up to the maximum allowed by law. The employer's share of the pension plan contribution for the year ended June 30, 1996 was $20,074, which includes $500 of administrative costs.

UPPER COLORADO RIVER COMMISSION
Supplemental Schedule of Cash Receipts and Disbursements – General Fund

Year ended June 30, 1996

Cash at July 1, 1995		$ 203,784
Cash receipts:		
Assessments	221,530	
Interest on time deposits	20,124	
Waternews subscriptions	1,650	
Selected legal reference	700	
Sale of assets	1,000	245,004
		448,788
Cash disbursements:		
Personal services	236,102	
Travel	13,619	
Current operating expenditures	25,098	
Capital outlay	855	(275,674)
Cash at June 30, 1996		$ 173,114

UPPER COLORADO RIVER COMMISSION
Expense Summary Schedules
Supplemental Schedule of Expenses – Budget and Actual

Year ended June 30, 1996

	Budget	Actual	Favorable (Unfavorable) Variance
Summary of Personal Services With Budget Comparisons			
Administrative salaries	$ 104,800	104,800	-
Legal salary	46,600	46,600	-
Engineering salary	44,100	44,341	(241)
Social security	13,850	13,747	103
Pension fund contributions	20,300	20,074	226
Employee medical insurance	6,500	4,740 *	1,760
Janitorial	1,850	1,800	50
	238,000	236,102	1,898
Summary of Current Operating Expenditures with Budget Total Comparison			
Accounting and auditing		1,750	
Telephone		2,947	
Insurance		3,000	
Printing		1,505	
Office supplies, postage and printing		2,986	
Library		5,646	
Meetings, including reporter		677	
Utilities		3,294	
Building repair and maintenance		2,320	
Outside services		560	
Memberships and meeting registrations		975	
	* * $ 26,000	25,660	340

* Premiums for the year were reduced by a rebate of $1,494.

* * The budgeted amount for operating expenditures is not classified into specific expenditures. The total budgeted amount is shown as a comparison against total actual expenditures.

APPENDIX B

BUDGET

FISCAL YEAR ENDING JUNE 30, 1998

BUDGET

UPPER COLORADO RIVER COMMISSION
Fiscal Year ending June 30, 1998
As Recommended July 18, 1996

PERSONAL SERVICES	
Administrative Salaries	
Executive Director	$ 87,000
Administrative Secretary	25,000
Professional Services	
Legal Counsel	50,000
Staff Engineer	32,100
Janitor	2,000
Pension Trust	19,800
Social Security	13,500
Health Insurance	6,100
	$235,500
TRAVEL	$ 17,000
CURRENT EXPENSES	$ 26,000
CAPITAL OUTLAY	$ 1,000
CONSULTANT FEES	0
CONTINGENCIES	$ 5,000
	$284,500
TOTAL BUDGETED EXPENSES	
To be funded from surplus	$ 16,600
Total Assessments for FY 1997	267,900
	$284,500

ASSESSMENTS 1998

Colorado	51.75%	$138,640
New Mexico	11.25%	30,140
Utah	23.00%	61,620
Wyoming	14.00%	$ 37,500
		$267,900

APPENDIX C

RESOLUTION HONORING

BARRY C. SAUNDERS

RESOLUTION
of
UPPER COLORADO RIVER COMMISSION
Honoring Barry C. Saunders

WHEREAS, Barry C. Saunders worked for the Utah Division of Water Resources from 1967 until his retirement in 1995; and

WHEREAS, Barry C. Saunders began serving the Upper Colorado River Commission in 1977 when he as appointed to the Engineering Committee; and

WHEREAS, Barry C. Saunders was appointed Chairman of the Engineering Committee in 1987; and

WHEREAS, Barry C. Saunders has acted as Commissioner for the State of Utah in the absence of Utah's Commissioner; and

WHEREAS, Barry C. Saunders honorably represented the State of Utah in all matters coming before the Commission and its Engineering Committee, and this representation has generated the respect of the Commission, its advisers and staff:

NOW, THEREFORE, BE IT RESOLVED that the Upper Colorado River Commission, at its Adjourned Annual and Adjourned Regular Meeting held in Denver, Colorado on June 18, 1996 does hereby express the gratitude and appreciation of the Commission and its staff for the untiring service and counsel rendered by Barry C. Saunders in solving the many technical and political water resource and endangered species problems that have confronted the Commission during his tenure as a member of the Upper Colorado River Commission's Engineering Committee and as Chairman of the Engineering Committee; and

BE IT FURTHER RESOLVED that the Upper Colorado River Commission, its advisers and staff sincerely wish Barry C. Saunders, his wife Marge and their family the best of health, happiness and prosperity in all their future endeavors;

BE IT FURTHER RESOLVED that the Executive Director of the Upper Colorado River Commission is directed to send a copy of this Resolution to Barry C. Saunders, the Executive Director of the Utah Department of Natural Resources and the Governor of the State of Utah.

CERTIFICATE

I, WAYNE E. COOK, Executive Director and Secretary of the Upper Colorado River Commission, do hereby certify that the above Resolution was unanimously adopted by the Upper Colorado River Commission at its Adjourned Annual and Adjourned Regular Meeting held in Denver, Colorado on June 18, 1996.

WITNESS my hand this 19th day of June, 1996.

Wayne E. Cook

WAYNE E. COOK
Executive Director and Secretary
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APPENDIX D

BY-LAWS
OF
UPPER COLORADO RIVER COMMISSION
AMENDED
JUNE 18, 1996

BY-LAWS
of
UPPER COLORADO RIVER COMMISSION

(Amended 6-18-96)

* * *

Article II

OFFICERS

1. The officers of the Commission shall be:

Chairman,
Vice-Chairman,
Secretary,
Treasurer,
Assistant Treasurer.

2. The Commissioner representing the United States of America shall be the Chairman of the Commission. The Chairman shall preside at meetings of the Commission. His duties shall be such as are usually imposed on such officers and such as may be assigned to him by these by-laws or by the Commission from time to time.

3. The Vice-Chairman shall be one of the Commissioners representing a State. He shall be elected at a meeting of the Commission and shall hold office until his successor is elected. In the case of a vacancy in the office of Vice Chairman, the Commission shall at its next meeting elect a Vice-Chairman. The Vice-Chairman shall perform all the duties of the Chairman when the Chairman is unable for any reason to act or when for any reason there is a vacancy in the office of Chairman. In addition the Vice-Chairman shall perform such other duties as may be assigned to him by the by-laws or the Commission from time to time.

4. The Secretary shall not be a member of the Commission, or an employee of any state signatory to the Upper Colorado River Basin Compact or of the United States of America while acting as Secretary. The Secretary shall be selected by the Commission. He shall serve for such term and receive such salary and perform such duties as the Commission may direct. In the case of a vacancy in the office of Secretary, the Commission shall proceed as expeditiously as possible to select a new Secretary. The Secretary shall furnish a bond for the faithful performance of his duties if the Commission shall so direct. The cost of such bond shall be paid by the Commission. The Commission may from time to time designate, or it may authorize the Secretary to designate, an employee to serve as Acting Secretary during the time the Secretary temporarily may be incapacitated or absent from the principal office of the Commission.

5. Neither the Treasurer nor the Assistant Treasurer need be a member of the Commission. The Treasurer shall be elected at a meeting of the Commission and shall hold office until his successor is elected and shall have qualified. The Assistant Treasurer shall be appointed by the Treasurer with the approval of the Commission and shall hold office until his successor is elected and shall have qualified. The Treasurer and the Assis-

tant Treasurer shall have power to receive, hold and disburse funds of the Commission. The Treasurer and the Assistant Treasurer shall each furnish a bond, or they shall furnish a joint bond covering both, for the faithful performance of his, or their, duties in such amount as the Commission may direct. The cost of such bond, or bonds, shall be paid by the Commission. In the case of a vacancy in the office of Treasurer the Chairman shall appoint a new Treasurer to serve until such time as the Commission shall elect a successor at a meeting and the person so elected shall have qualified. In the case of a vacancy in the office of Assistant Treasurer, the Treasurer shall, with the approval of the Chairman, appoint a new Assistant Treasurer, who shall serve until such time as a successor shall have been appointed and such appointment shall have been approved by the Commission.

6. The Commission may employ such engineering, legal, clerical and other personnel as, in its judgment, may be necessary. They shall receive such compensation and perform such duties as may be fixed by the Commission.

* * *

Article IV

MEETINGS

1. The Commission shall meet at least twice each year unless all of the Commissioners agree in writing that one or both meetings is/are not necessary. The two meetings shall be held approximately six months apart in the year. A meeting may be called by the Chairman, or in the case of vacancy in the office of the Chairman or inability of the Chairman to act, by the Vice-Chairman, or at the request of two or more Commissioners. The Commissioners shall agree in writing to the date, time and place of each meeting.

2. Special meetings of the Commission may be called by the Chairman, or in case of vacancy in the office of the Chairman or inability of the Chairman to act, by the Vice-Chairman. Upon written request of two or more Commissioners it shall be the duty of the Chairman to call a special meeting.

3. Notice of all meetings of the Commission shall be sent by the Secretary, or in the case of a vacancy in the office of Secretary or the inability of the Secretary to act, by the Chairman, to all members of the Commission by ordinary mail at least ten days in advance of each such meeting. The notice here required may be waived by unanimous consent of all members of the Commission.

4. All meetings will be held at a time and place agreed to in advance by not less than four members of the Commission. No meeting of the Commission shall be held other than in the Colorado River Basin States or in Washington, D.C. unless at least four members of the Commission have consented in writing to the place for the meeting in advance of the transmittal of notices of the meeting. The Commission shall hold no meetings outside of the United States of America.

5. The Commission shall employ a qualified Reporter to record and transcribe the proceedings of the meetings of the Commission. The transcript and the approved minutes of the Commission shall be preserved in a suitable manner. Minutes until approved by the Commission shall not be official and shall be furnished only to members of the Commission, its employees and committees.

6. Any four members of the Commission shall constitute a quorum: provided that, when a quorum is present, an absent member may be represented by his proxy and such proxy shall have all of the powers of a member at such meeting.

7. Each member of the Commission shall have one vote.

8. Except as otherwise provided in the Upper Colorado River Basin Compact or herein, the concurrence of four members of the Commission shall be required in any action taken by it.

9. At each meeting of the Commission, the order of business, unless agreed otherwise, shall be as follows:

Call to order;

Reading of minutes of last meeting;

Approval of minutes of last meeting;

Report of Chairman;

Report of Staff;

Report of Treasurer;

Report of Committees;

Unfinished business;

New business;

Adjournment.

10. All meetings of the Commission, except executive sessions, shall be open to the public. Executive sessions shall be open only to officers and members of the Commission and two advisers designated by each member; provided, however, that the Commission may call witnesses before it in such sessions.

* * *

APPENDIX E
TRANSMOUNTAIN DIVERSIONS
UPPER COLORADO RIVER BASIN
1987-1996

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN IN COLORADO 1987-1996

	1987	1988	1989	1990	1991	1992	1993	1994	1995[1]	1996	10 YEAR AVERAGE
TO PLATTE RIVER BASIN											
Grand River Ditch	17,640	19,050	18,830	20,980	18,410	21,360	24,770	17,870	19,808	23,260	20,198
Eureka Ditch	60	60	60	60	60	212	95	0	180	0	79
Alva B. Adams Tunnel	246,200	258,000	273,200	213,700	199,200	198,300	206,400	233,200	238,500	207,300	227,400
Berthoud Pass Ditch	271	710	843	623	624	1,010	1,260	874	815	1,530	856
Moffat Water Tunnel	50,130	75,530	66,530	67,390	64,900	49,890	34,470	43,310	24,220	51,050	52,742
Boreas Pass Ditch	0	0	0	0	82	175	334	83	0	209	88
Vidler Tunnel	396	758	975	660	1,240	1,150	1,150	465	760	268	782
Harold D. Roberts Tunnel	14,640	53,060	74,380	59,420	65,850	85,530	124,100	73,890	52,176	36,920	63,997
Straight Creek Tunnel	N/A	N/A	N/A	370	269	363	408	330	320	399	351
TO ARKANSAS RIVER BASIN											
Hoosier Pass Tunnel	8,830	9,680	10,720	11,200	12,400	11,570	11,186	9,188	4,532	12,306	10,161
Columbine Ditch	1,210	1,050	1,420	746	1,602	1,610	2,478	1,470	2,390	2,500	1,648
Ewing Ditch	813	1,030	786	785	869	934	1,622	796	1,410	1,440	1,049
Wurtz Ditch	2,200	881	2,070	1,702	2,260	2,173	4,031	2,073	4,241	4,210	2,584
Homestake Tunnel	18,540	28,690	26,840	27,480	638	26,910	28,110	24,230	23,505	38,690	24,363
Twin Lakes Tunnel	18,110	32,420	37,410	41,368	42,980	41,970	62,664	42,850	33,120	34,850	38,774
Charles H. Boustead Tunnel	3,340	14,280	37,240	47,270	61,130	57,060	88,740	55,040	91,300	38,540	49,394
Busk-Ivanhoe Tunnel	3,600	4,270	3,760	5,170	5,660	5,210	4,980	4,100	5,817	2,450	4,502
Larkspur Ditch	77	60	30	8	95	205	334	146	116	60	113
TO RIO GRANDE BASIN											
Tarbell Ditch	55	195	344	79	0	344	109	207	68	368	177
Tabor Ditch	1,310	384	487	627	997	684	1,060	639	1,240	375	780
Treasure Pass Ditch	0	223	163	53	9	63	113	94	0	15	73
Don La Font Ditches No. 1 & 2	361	754	339	138	473	480	0	364	50	112	307
Williams Creek-Squaw Pass Ditch	530	232	238	205	235	475	441	279	374	124	313
Pine River-Weminuche Pass Ditch	575	866	508	451	257	520	246	172	672	42	431
Weminuche Pass Ditch	16	419	878	960	685	2,630	0	0	0	0	559
TOTAL	**388,904**	**502,602**	**558,051**	**501,445**	**480,925**	**510,828**	**599,101**	**511,670**	**505,614**	**457,018**	**501,721**

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN IN COLORADO TO RIO GRANDE BASIN IN NEW MEXICO 1987-1996

San Juan-Chama Diversions	83,050	63,590	51,416	71,710	119,440	87,090	98,800	82,300	85,100[1]	57,239	79,974

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN IN UTAH [2]
1987-1996

	1987	1988	1989	1990	1991	1992	1993	1994	1995 [1]	1996	10 YEAR AVERAGE
TO GREAT BASIN											
Fairview Tunnel	2,260	1,124	1,988	2,555	3,460	1,525	4,474	2,049	2,445	2,830	2,471
Ephraim Tunnel	901	549	533	2,682	2,751	1,808	4,007	1,004	2,629	2,132	1,900
Spring City Tunnel	1,490	683	844	2,033	2,149	1,632	3,391	1,334	2,670	2,824	1,905
Strawberry Tunnel	83,192	89,138	88,797	82,006	68,331	62,342	85,034	87,960	48,701	63,652	75,915
Hobble Creek Ditch	629	633	427	510	552	369	1,051	694	825	590	628
Strawberry-Willow Creek Ditch	739	743	1,113	1,773	1,342	2,041	2,171	962	953	1,379	1,322
Strawberry Reservoir to Bonneville Basin via Syar Tunnel	80,876	88,642	115,416	116,031	88,919	136,667	100,727	96,929	48,701	63,825	93,673
Duchesne Tunnel	23,239	25,025	25,609	29,125	21,062	15,678	35,648	22,817	39,859	31,895	26,996
TOTAL	**193,326**	**206,537**	**234,727**	**236,715**	**188,566**	**222,062**	**236,503**	**213,749**	**146,783 [1]**	**169,127**	**204,809**

TRANSMOUNTAIN DIVERSIONS FROM GREAT BASIN IN UTAH TO COLORADO RIVER BASIN IN UTAH
1987-1996

Tropic and East Fork Canal	6,155	6,145	3,717	3,332	3,612	5,325	6,509	4,801	7,022	4,542	5,116

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN TO NORTH PLATTE BASIN IN WYOMING [3]
1987-1996

	8,379	7,044	12,489	13,894	16,462	12,450	23,422	14,405	12,144 [1]	17,014	13,770

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN [4]
1987-1996

TOTAL	**667,504**	**773,628**	**852,966**	**820,432**	**801,781**	**827,105**	**951,317**	**817,324**	**742,619 [1]**	**695,856**	**795,053**

[1] Based on preliminary streamflow records obtained from U.S. Bureau of Reclamation, U.S. Geological Survey, Central Utah Water Conservancy District, Colorado Division of Water Resources, New Mexico Interstate Stream Commission, and Wyoming State Engineer's Office - subject to revision.

[2] Stream gaging of the following small transmountain diversions in Utah was discontinued in 1959, but the flow is estimated to be as follows: Candland Ditch - 200 acre-feet; Horseshoe Tunnel - 600 acre-feet; Larsen Tunnel - 690 acre-feet; Coal Fork Ditch - 260 acre-feet; Twin Creek Tunnel - 200 acre-feet; Cedar Creek Tunnel - 340 acre-feet; Black Canyon Ditch - 290 acre-feet; Reeder Ditch - 250 acre-feet; Madsen Ditch - 40 acre-feet; and John August Ditch - 200 acre-feet. These diversions are from the San Rafael River in the Colorado River Basin to the Great Basin in Utah and total about 3,100 acre-feet annually.

[3] Does not include diversions for enlargement Continental Divide Ditch which services 437 acres, or Ranger Ditch which services 391 acres. Neither ditch is gaged and suitable estimates of diversion amounts are currently unavailable.

[4] The total diversion is the sum of all diversions except Tropic and East Fork Canal, which imports water to the Colorado River Basin.