

# **FORTY-FIRST ANNUAL REPORT OF THE ARKANSAS RIVER COMPACT ADMINISTRATION**

**1989 Compact Year  
November 1, 1988 to October 31, 1989**

\*\*\*\*\*

## **THE ADMINISTRATION**

**FRANK G. COOLEY**  
Chairman and Representative of the United States

**J. WILLIAM McDONALD,**  
**CARL G. GENOVA and JAMES G. ROGERS**  
for Colorado

**DAVID L. POPE,**  
**CARL E. BENTRUP, and RONALD OLOMON**  
for Kansas

\*\*\*\*\*

**307 South Fifth Street  
Lamar, Colorado 81052**

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# **FORTY-FIRST ANNUAL REPORT OF THE ARKANSAS RIVER COMPACT ADMINISTRATION 1989**

(Report-Year November 1, 1988 to October 31, 1989)

TO THE PRESIDENT OF THE UNITED STATES AND THE GOVERNORS  
OF THE STATES OF COLORADO AND KANSAS, SIRS:

Pursuant to Article VIII of the Arkansas River Compact, the Arkansas River Compact Administration submits its report for the 1989 Report-Year, November 1, 1988 through October 31, 1989, as follows:

## **1. MEMBERS of the ADMINISTRATION**

- Representative of the United States:  
Frank G. Cooley; Meeker, Colorado
- Colorado Representatives:  
J. William McDonald; Denver, Colorado  
Carl G. Genova; Pueblo, Colorado  
James G. Rogers; Lamar, Colorado
- Kansas Representatives:  
David L. Pope; Topeka, Kansas  
Carl E. Bentrup; Deerfield, Kansas  
Ronald Olomon; Garden City, Kansas

## **2. OFFICERS of the ADMINISTRATION** (as elected Dec. 13, 1988)

- Chairman: Frank G. Cooley
- Vice Chairman: Carl E. Bentrup
- Recording Secretary: Bernice Carr
- Treasurer: James G. Rogers
- Operations Secretary: William Howland (acting, Nov. 1, '88 - Dec. 13, '88)  
Steven J. Witte (Dec. 13, '88 - Oct. 31, '89)

### 3. STANDING COMMITTEES (as appointed Dec. 13, 1988)

- Administrative and Legal Committee:  
Carl E. Bentrup (Chairman), J. William McDonald
- Engineering Committee:  
Carl G. Genova (Chairman), David L. Pope
- Operations Committee:  
James G. Rogers (Chairman), Ronald Olomon
- The Representative of the United States, Frank G. Cooley, is an ex-officio member of all standing committees.

### 4. MEETINGS

- Administrative & Legal Committee: did not meet
- Engineering Committee: met Dec. 12, 1988
- Operations Committee: met Dec. 12, 1988 & Dec. 11, 1989
- Annual Meeting, Lamar, Colorado: Dec. 13, 1988 & Dec. 12, 1989

The minutes of the December Annual Meetings are not included in this annual report. Transcripts of the meeting minutes were provided to the Compact Administration and to each state previously. Copies of the minutes are also available upon request from the Administration office in Lamar. The minutes of the Annual Meeting contain a record of both the Engineering and Operations Committees' discussions.

At its December 12, 1988 meeting the Engineering Committee considered a request to transfer the Keesee Ditch water rights from Colorado Water District 67 and to create a new storage account for those rights at John Martin Reservoir. A number of issues were identified and discussed, but no final action was taken.

At its December 11, 1989 meeting the Operations Committee reviewed the "Annual Report of the Operations Secretary Concerning the Operation of John Martin, 1989" (hereinafter "Oper. Sec. 89 Report") and recommended its acceptance and approval by the full Administration. Much of the data contained in this annual report is derived from that report. The Operations Committee also adopted and recommended to the Administration procedures to be used for temporary storage at John Martin Reservoir by the City of Lamar of transmountain water obtained for well recharge purposes.

## **5. FISCAL**

The Administration's Fiscal Year (FY) runs from July 1 to June 30. The fiscal affairs of the Administration for Compact Year 1989 involve portions of the Administration's FY 1988-89 and FY 1989-90. The Treasurer reported on the financial status of the Administration for the applicable portions of those fiscal years at the Annual Meetings held on December 13, 1988 and December 12, 1989.

At the December 13, 1988 Annual Meeting the Administration took the following budget actions:

- reviewed and left unchanged the previously adopted budget for the remainder of FY 1988-89 with expenditures of \$38,395;
- revised the budget for FY 1989-90 to reflect anticipated expenses of \$38,525;
- for planning purposes adopted a FY 1990-91 budget with anticipated expenditures through June 30, 1991 of \$35,980.

Copies of these budgets are included in this report as Appendix A-1.

At the close of the fiscal year on June 30, 1989 the Administration had a cash balance of \$46,685 as shown in the FY 1988-89 Auditor's Report accepted at the December 12, 1989 Annual Meeting. The Auditor's Report is included herein as Appendix A-2. On December 11, 1989 the Administration had a cash balance of \$53,216 as reported by the Treasurer and shown on Appendix A-3.

## **6. FACTS ABOUT THE JOHN MARTIN RESERVOIR PROJECT**

The John Martin Reservoir ("JMR") Project was built by the United States Army Corps of Engineers ("Corps of Engineers"). The project was authorized by Congress in the Flood Control Act of June 22, 1936 when the federal responsibility for flood control throughout the country was assigned to the Corps of Engineers. It is located on the Arkansas River, 58 miles upstream from the Colorado-Kansas Stateline and 18 miles upstream from the City of Lamar, Colorado. Construction of the project began in the fall of 1939, but work was suspended due to World War II from the spring of 1943 to the spring of 1946. The project was completed in October, 1948, at a cost of about \$15 million. The War Department Civil Appropriation Act of June 24, 1940 changed the name of the project from Caddoa Reservoir Project to John Martin Reservoir Project, in honor of the late Congressman John A. Martin of Colorado. It is operated by the United States Army Engineer District, Albuquerque, New Mexico. Mr. Russell Smith has been the resident superintendent of the project since October, 1976.

The JMR Project is a part of the comprehensive plan for the control of floods and the development of water resources in the Arkansas River Basin. A 1986 survey of the reservoir in official use since February 1, 1988 shows 259,562 acre-feet of storage capacity above elevation 3851.87 for flood control protection of the fertile Arkansas River Valley downstream of the dam. The release of stored flood waters is planned so that, when combined with flows originating downstream from the dam, the capacity of the river channel will not be exceeded. Downstream flood damages prevented by JMR already exceed the cost of the project, and total project benefits to date have surpassed the \$115 million mark.

The reservoir also provides 348,683 acre-feet of storage space for conservation and recreation purposes below elevation 3851.87. JMR supplies water to irrigated lands as far downstream as Garden City, Kansas. The conservation pool can store up to 338,639 acre-feet of water for irrigation. Upon request of the Arkansas River Compact Administration, irrigation water for downstream water users is released by the Corps of Engineers through outlet works in the base of the dam.

Recreation and favorable fish and wildlife habitats are provided by a 10,000 acre-foot permanent pool authorized by Congress in 1965. With reservoir lands open to all, there are many attractive public use areas for outdoor recreation, water sports, fishing and boating, and camping. During project construction some embankment material was

obtained from a 75-acre tract of land immediately downstream of the dam. This excavated area, averaging 12 feet deep, filled with water and formed Lake Hasty, now used for year-round recreation. A half-mile segment of the historic Santa Fe Trail north of the reservoir has been enclosed by a fence and marked with an appropriate sign.

John Martin Dam consists of a concrete gravity structure 1,644 feet long and 120 feet high, and an earthfill structure 2,600 feet long. The concrete gravity structure contains a spillway controlled by sixteen 30 foot by 64 foot tainter gates and their operating machinery. There are earthen wing dams on either side of the main dam. The north wing dam is 3,880 feet long, connecting to the earthfill structure of the main dam at the north abutment. The south wing dam is 5,807 feet long and connects to the south end of the concrete structure of the main dam. A bituminous-surfaced roadway, 21 feet wide, extends along the crest of the north wing dam, main dam, and south wing dam. The overall length of the structure is 2.6 miles. Detailed project data is shown below.

#### **DAM**

|                                            |        |
|--------------------------------------------|--------|
| Total length, feet .....                   | 13,945 |
| Maximum height above streambed, feet ..... | 118    |
| Width of roadway on dam, feet .....        | 21     |

#### **SPILLWAY**

|                                                 |         |
|-------------------------------------------------|---------|
| Total length, including piers, feet .....       | 1,174   |
| Crest gates, 30' x 64' .....                    | 16      |
| Discharge capacity, cubic feet per second ..... | 639,200 |

#### **OUTLET WORKS**

|                                    |   |
|------------------------------------|---|
| Sluicing conduits, 6' x 7.5' ..... | 4 |
| Regulating conduits, 4' x 4' ..... | 2 |

#### **RESERVOIR**

|                                                                                               |         |
|-----------------------------------------------------------------------------------------------|---------|
| Capacity, acre-feet at elevation 3,870.00 .....                                               | 608,245 |
| Flood control storage, acre-feet .....                                                        | 259,562 |
| Conservation (irrigation) and recreation storage, acre-feet<br>below elevation 3,851.87 ..... | 348,683 |
| Water surface at spillway crest, acres .....                                                  | 8,975   |
| Water surface at top of conservation pool, acres .....                                        | 11,645  |
| Water surface at top of flood control pool, acres .....                                       | 17,151  |
| Drainage areas, square miles .....                                                            | 18,915  |

## **7. COOPERATIVE STUDIES and ACTIVITIES**

Article VIII.G.(1) of Arkansas River Compact requires the Administration to cooperate with the chief official of each of the states of Colorado and Kansas charged with the administration of water rights in their respective states, and with the Federal agencies in systematically determining and correlating the facts pertaining to the flow and diversion of the water of the Arkansas River and to the operation and siltation of John Martin Reservoir and other related structures. Article VIII.G.(2) requests the Director of the United States Geological Survey, the Commissioner of the United States Bureau of Reclamation, and the Chief of Engineers, United States Army, to cooperate and collaborate with the Administration and with appropriate state officials in such determinations and correlations of stream flow and related data. Under the By-Laws of the Administration, these cooperative studies and activities are assigned to the Engineering Committee of the Administration.

During the year covered by this report the Administration has received excellent cooperation from all agencies referred to in the foregoing provisions of the Compact. The United States Geological Survey ("USGS") has continued the operation of the compact gaging stations and the analysis of and compilation of the hydrologic data presented in this report and used in the administration of the Compact. The Corps of Engineers continued to operate the conservation pool of John Martin Reservoir in accordance with the terms of the Compact and the resolutions and orders of the Administration.

## **8. WATER SUPPLY, RESERVOIR OPERATION, and HYDROLOGIC DATA**

Reservoir operations at John Martin follow the operating plan adopted by the Compact Administration on April 24, 1980. This operating plan was revised on May 10, 1984, and December 11, 1984, but has not been revised since that time. Accordingly, a system of water storage accounts exists at JMR into which reservoir inflows are distributed for release at a later date. While these accounts have often been referred to as "Article II" and "Article III" accounts, the correct designation based on the organization of the operating plan resolution is "Section II" and "Section III" accounts. This report uses the term "Section" whenever referring to the accounts established pursuant to the operating plan.

General reservoir operations throughout Compact Year 1989 are described in Table 1, below.

The 1989 Arkansas River Compact Year and the winter season for JMR began at 0001 hour November 1, 1988 with 78,983.57 acre-feet in the reservoir distributed as shown in Table 2, below. Winter storage officially ended at 2400 hours on March 31, 1989 with a total inflow to the reservoir of 53,504.93 acre-feet. Inflow was distributed to the agreement accounts pursuant to the operating plan as shown in Table 3, below.

Releases of 3,950.50 acre-feet of agreement account water to various Colorado District 67 ditches occurred during the period March 15-31. Other than during this period, no water was physically released from the reservoir during the winter season. Following the transfer of other winter water stored at John Martin Reservoir into the appropriate agreement accounts the allocation of the reservoir contents on March 31, 1989 was as shown in Table 4, below. Total contents according to the Corps of Engineers was 124,289 acre-feet which agrees closely with the 124,290 acre-feet reported by the Operations Secretary for this date.

With moderate runoff there was no need for flood control operations during Compact Year 1989, as reflected in Table 5, below.

**TABLE 1  
JOHN MARTIN RESERVOIR  
OPERATION  
COMPACT YEAR 1989 (AF)**

| <u>Month</u>    | <u>Contents<br/>Begin Month</u> | <u>Inflow to<br/>Storage</u> | <u>Evaporation</u> | <u>Storage<br/>Release</u> | <u>Contents<br/>End Month</u> |
|-----------------|---------------------------------|------------------------------|--------------------|----------------------------|-------------------------------|
| Nov. '88        | 78,983.57                       | 9,272.43                     | 988.00             | 0.00                       | 87,268.00                     |
| Dec.            | 87,268.00                       | 11,401.00                    | 622.00             | 0.00                       | 98,047.00                     |
| Jan. '89        | 98,047.00                       | 11,502.00                    | 175.00             | 0.00                       | 109,374.00                    |
| Feb.            | 109,374.00                      | 10,669.00                    | 181.00             | 0.00                       | 119,862.00                    |
| Mar.            | 119,862.00                      | <u>10,660.50</u>             | <u>2,282.00</u>    | <u>3,950.50</u>            | 124,290.00                    |
| Winter Subtotal |                                 | <u>53,504.93</u>             | <u>4,248.00</u>    | <u>3,950.50</u>            |                               |
| Apr.            | 124,290.00                      | 1,870.02                     | 2,875.00           | 27,927.34                  | 95,357.68                     |
| May             | 95,357.68                       | 10,221.18                    | 2,851.00           | 18,638.09                  | 84,089.77                     |
| June            | 84,089.77                       | 2,739.81                     | 2,656.00           | 6,088.06                   | 78,085.52                     |
| July            | 78,085.52                       | 2,633.95                     | 3,616.00           | 24,728.12                  | 52,375.35                     |
| Aug.            | 52,375.35                       | 0.00                         | 2,047.00           | 13,379.83                  | 36,948.52                     |
| Sept.           | 36,948.52                       | 0.00                         | 1,506.00           | 811.99                     | 34,630.53                     |
| Oct. '89        | 34,630.53                       | <u>0.00</u>                  | <u>934.00</u>      | <u>6,289.75</u>            | 27,406.78                     |
| Summer Subtotal |                                 | <u>17,464.96</u>             | <u>16,485.00</u>   | <u>97,863.18</u>           |                               |
| Year            |                                 | 70,969.89                    | 20,733.00          | 101,813.00                 |                               |

**NOTES**

- [1] Inflows per Oper. Sec. 89 Report (Tables I and II) plus storage under Amity Great Plains decree in May and July (Table VI) of 2456.12 AF, and storage of 1805.40 AF of City of Lamar Fry-Ark water in July and August.
- [2] Evaporation per Oper. Sec. 89 Report (Tables I,II,VI,VIII) plus City of Lamar temporary operation in the amount of 36.09 AF.
- [3] Releases per Oper. Sec. 89 Report (Table VI) plus City of Lamar at 1769.31 AF.
- [4] Peak contents, 125,349 AF, at elevation 3826.59, reached on March 16, 1989.
- [5] Conservation storage first exhausted April 16, 1989. District 67 water rights thereafter administered in priority and all inflow to JMR passed through pursuant to Section II.C of the Operating Plan, except for two periods of summer storage (May 16-29, June 4-15).

**TABLE 2  
JOHN MARTIN RESERVOIR  
CONTENTS DISTRIBUTION [AF]  
NOVEMBER 1, 1988**

| <u>Storage Component</u>           | <u>Subtotal</u> | <u>Contents</u> |
|------------------------------------|-----------------|-----------------|
| Section II Agreement Accounts      |                 |                 |
| Kansas Account                     | 26,230.93       |                 |
| Dist. 67 Accounts                  | 30,213.02       |                 |
| Transit Loss Account               | <u>6,263.11</u> |                 |
| Subtotal Section II                | 62,707.06       | 62,707.07       |
| Section III Agreement Accounts [2] |                 |                 |
| Amity                              | 8,843.54        |                 |
| Ft. Lyon                           | 0.00            |                 |
| Las Animas Cons.                   | <u>0.00</u>     |                 |
| Subtotal Section III               | 8,843.54        | 8,843.54        |
| Flood Pool                         |                 | 0.00            |
| Permanent Pool                     |                 | <u>7,432.97</u> |
| Total Reservoir Contents           |                 | 78,983.57       |

**NOTES**

[1] Source: Oper. Sec. 89 Report, November accounting sheets.

**TABLE 3  
JOHN MARTIN RESERVOIR  
WINTER INFLOW DISTRIBUTION [AF]  
COMPACT YEAR 1989**

| <u>Storage Component</u>      | <u>Subtotal</u> | <u>Inflow</u>    |
|-------------------------------|-----------------|------------------|
| Winter Compact Water          |                 | 27,371.15        |
| Other Winter Water [1]        |                 |                  |
| Amity Canal, Section III      | 21,976.53       |                  |
| Ft Lyon Canal, Section III    | 0.00            |                  |
| Las Animas Cons., Section III | 3,607.32        |                  |
| Other Winter Evap.            | <u>549.93</u>   |                  |
| Subtotal Other Winter Water   | 26,133.78       | <u>26,133.78</u> |
| Total Winter Inflow           |                 | 53,504.93        |

**NOTES**

[1] Allocated to Section III accounts as shown at conclusion of winter water program March 16, 1989. Evaporation of winter water subtracted prior to transfer, transit loss account credited after transfer by release from individual Section III accounts.

[2] Source: Oper. Sec. 89 Report, Tables I, II, III, IV, and V.

| <b>TABLE 4</b><br><b>JOHN MARTIN RESERVOIR</b><br><b>CONTENTS DISTRIBUTION (AF)</b><br><b>MARCH 31, 1989</b> |                 |                 |
|--------------------------------------------------------------------------------------------------------------|-----------------|-----------------|
| <u>Storage Component</u>                                                                                     | <u>Subtotal</u> | <u>Contents</u> |
| 1989 Winter Compact Water                                                                                    |                 | 26,793.62       |
| Section II Agreements Accounts                                                                               |                 |                 |
| Kansas Account                                                                                               | 27,078.47       |                 |
| Dist. 67 Accounts                                                                                            | 29,204.56       |                 |
| Transit Loss Account                                                                                         | <u>8,954.35</u> |                 |
| Subtotal Section II                                                                                          | 65,237.38       | 65,237.38       |
| Section III Agreements Accounts                                                                              |                 |                 |
| Amity                                                                                                        | 22,776.73       |                 |
| Ft. Lyon                                                                                                     | 0.00            |                 |
| Las Animas Cons.                                                                                             | <u>2,344.76</u> |                 |
| Subtotal Section III                                                                                         | 25,121.49       | 25,121.49       |
| Flood Pool                                                                                                   |                 | 0.00            |
| Permanent Pool                                                                                               |                 | <u>7,137.51</u> |
| Total Contents                                                                                               |                 | 124,290.00      |
| NOTES                                                                                                        |                 |                 |
| [1] Source: Oper. Sec. 89 Report, March accounting sheets.                                                   |                 |                 |

| <b>TABLE 5</b><br><b>JOHN MARTIN RESERVOIR</b><br><b>FLOOD POOL OPERATION (AF)</b><br><b>COMPACT YEAR 1989</b> |                                       |                                    |                    |                                  |                                     |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------|--------------------|----------------------------------|-------------------------------------|
| <u>Month</u>                                                                                                   | <u>Contents</u><br><u>Begin Month</u> | <u>Inflow to</u><br><u>Storage</u> | <u>Evaporation</u> | <u>Storage</u><br><u>Release</u> | <u>Contents</u><br><u>End Month</u> |
| Nov.'88                                                                                                        | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Dec.                                                                                                           | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Jan.'89                                                                                                        | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Feb.                                                                                                           | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Mar                                                                                                            | 0.00                                  | <u>0.00</u>                        | <u>0.00</u>        | <u>0.00</u>                      | 0.00                                |
| Winter subtotal                                                                                                |                                       | <u>0.00</u>                        | <u>0.00</u>        | <u>0.00</u>                      |                                     |
| Apr.                                                                                                           | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| May                                                                                                            | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| June                                                                                                           | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| July                                                                                                           | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Aug.                                                                                                           | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Sept.                                                                                                          | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Oct.'89                                                                                                        | 0.00                                  | <u>0.00</u>                        | <u>0.00</u>        | <u>0.00</u>                      | 0.00                                |
| Summer subtotal                                                                                                |                                       | <u>0.00</u>                        | <u>0.00</u>        | <u>0.00</u>                      |                                     |
| Year Total                                                                                                     |                                       | 0.00                               | 0.00               | 0.00                             |                                     |
| NOTES                                                                                                          |                                       |                                    |                    |                                  |                                     |
| [1] No flood pool operations in CY 1989.                                                                       |                                       |                                    |                    |                                  |                                     |
| [2] Source: Oper. Sec. 89 Report, Table IX.                                                                    |                                       |                                    |                    |                                  |                                     |

The summer storage season began at 0001 April 1, 1989. Transfer of winter conservation storage into the agreement accounts began immediately. Three Colorado ditches began requesting water on April 1. All winter compact water was released into agreement accounts by April 14, 1989. Thereafter, pursuant to Section II.C of the "Resolution Concerning an Operating Plan for John Martin Reservoir," all inflows passed directly through John Martin until May 16, 1989. From May 16 to May 29 and again from June 4 to June 15 short periods of summer conservation storage occurred. No other conservation storage inflows occurred during the remainder of Compact Year 1989. Summer conservation storage operations are shown in Table 6, below.

Pursuant to the operating plan, water released from conservation storage was placed in the agreement accounts and subsequently accounted for as shown in Table 7, below.

Summer operations of the Section III accounts during Compact Year 1989 are summarized in Table 8, below. Pursuant to the operating plan the Amity Canal is the only entity currently entitled to store Section III water during the summer storage season. The Fort Lyon Canal and Las Animas Consolidated Canal may however request releases of any accumulated Section III water during the summer season.

| <b>TABLE 6</b><br><b>JOHN MARTIN RESERVOIR</b><br><b>CONSERVATION STORAGE SUMMER OPERATION (AF)</b><br><b>COMPACT YEAR 1989</b>                                              |                                       |                                    |                    |                                  |                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------|--------------------|----------------------------------|-------------------------------------|
| <u>Month</u>                                                                                                                                                                 | <u>Contents</u><br><u>Begin Month</u> | <u>Inflow to</u><br><u>Storage</u> | <u>Evaporation</u> | <u>Storage</u><br><u>Release</u> | <u>Contents</u><br><u>End Month</u> |
| Apr. '89                                                                                                                                                                     | 26,793.62                             | 1,735.26                           | 138.47             | 28,390.41                        | 0.00                                |
| May                                                                                                                                                                          | 0.00                                  | 8,593.61                           | 7.71               | 8,585.90                         | 0.00                                |
| June                                                                                                                                                                         | 0.00                                  | 2,739.81                           | 1.36               | 2,738.45                         | 0.00                                |
| July                                                                                                                                                                         | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Aug.                                                                                                                                                                         | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Sept.                                                                                                                                                                        | 0.00                                  | 0.00                               | 0.00               | 0.00                             | 0.00                                |
| Oct. '89                                                                                                                                                                     | 0.00                                  | <u>0.00</u>                        | <u>0.00</u>        | <u>0.00</u>                      | 0.00                                |
| Total                                                                                                                                                                        |                                       | 13,068.68                          | 147.54             | 39,714.76                        |                                     |
| NOTES                                                                                                                                                                        |                                       |                                    |                    |                                  |                                     |
| [1] April inflow does not include additional 134.76 AF of water delivered directly from Pueblo Reservoir to Section III accounts to balance winter water program accounting. |                                       |                                    |                    |                                  |                                     |
| [2] Not physically released from reservoir, transferred to operating plan accounts.                                                                                          |                                       |                                    |                    |                                  |                                     |
| [3] Source: Oper. Sec. 89 Report, Table I.                                                                                                                                   |                                       |                                    |                    |                                  |                                     |

**TABLE 7**  
**JOHN MARTIN RESERVOIR**  
**AGREEMENT ACCOUNTS SUMMER OPERATION [AF]**  
**COMPACT YEAR 1989**

| <u>Month</u> | <u>Contents</u><br><u>Begin Month</u> | <u>Inflow to</u><br><u>Storage</u> | <u>Evaporation</u> | <u>Storage</u><br><u>Release</u> | <u>Contents</u><br><u>End Month</u> |
|--------------|---------------------------------------|------------------------------------|--------------------|----------------------------------|-------------------------------------|
| Apr. '89     | 90,358.87                             | 28,525.17                          | 2,550.39           | 27,927.34                        | 88,406.30                           |
| May          | 88,406.31                             | 10,213.47                          | 2,616.63           | 18,638.09                        | 77,365.00                           |
| June         | 77,365.06                             | 2,738.45                           | 2,440.33           | 6,088.06                         | 71,575.10                           |
| July         | 71,575.12                             | 828.55                             | 3,251.81           | 23,845.36                        | 45,306.50                           |
| Aug.         | 45,306.50                             | 0.00                               | 1,736.05           | 12,493.28                        | 31,077.10                           |
| Sept.        | 31,077.17                             | 0.00                               | 1,263.09           | 811.99                           | 29,002.00                           |
| Oct. '89     | 29,002.09                             | <u>0.00</u>                        | <u>758.52</u>      | <u>6,289.75</u>                  | 21,953.80                           |
| Total        |                                       | 42,305.64                          | 14,616.82          | 96,093.87                        |                                     |

**NOTES**

[1] Agreement accounts include the sum of accounts established in Section II.D and III. A,B and C of the Operating Plan Resolution, i.e. Colorado District 67 ditches, Kansas, transit loss, and the Amity, Ft. Lyon, and Las Animas Consolidated.

[2] Does not include City of Lamar operations with Fry-Ark water as follows: inflow 1805.40 AF, evaporation 36.09 AF, release 1769.31 AF.

[3] Source: Oper. Sec. 89 Report, Table VI.

**TABLE 8**  
**JOHN MARTIN RESERVOIR**  
**SECTION III ACCOUNTS SUMMER OPERATION [AF]**  
**COMPACT YEAR 1989**

| <u>Month</u> | <u>Contents</u><br><u>Begin Month</u> | <u>Inflow to</u><br><u>Storage</u> | <u>Evaporation</u> | <u>Storage</u><br><u>Release</u> | <u>Contents</u><br><u>End Month</u> |
|--------------|---------------------------------------|------------------------------------|--------------------|----------------------------------|-------------------------------------|
| Apr. '89     | 25,121.49                             | 134.76                             | 551.00             | 12,245.59                        | 12,459.66                           |
| May          | 12,459.66                             | 1,627.57                           | 231.41             | 7,827.10                         | 6,028.72                            |
| June         | 6,028.72                              | 0.00                               | 186.36             | 640.72                           | 5,201.64                            |
| July         | 5,201.64                              | 828.55                             | 233.21             | 3,059.02                         | 2,737.96                            |
| Aug.         | 2,737.96                              | 0.00                               | 121.08             | 825.95                           | 1,790.93                            |
| Sept.        | 1,790.93                              | 0.00                               | 74.08              | 0.00                             | 1,716.85                            |
| Oct. '89     | 1,716.85                              | <u>0.00</u>                        | <u>53.53</u>       | <u>0.00</u>                      | 1,663.32                            |
| Total        |                                       | 2,590.88                           | 1,450.67           | 24,598.38                        |                                     |

**NOTES**

[1] April inflow was adjustment to winter water program accounting distributed between all Section III accounts. Other inflows were to Amity account per Great Plains Res. decree.

[2] Source: Oper. Sec. 89 Report, Tables III, IV, V.

Kansas called for releases of 32,000.52 acre-feet from its account in Compact Year 1989. Operations of the Kansas account including the demands for releases made by Kansas are summarized in Tables 9 and 10. These operations are also detailed in Appendices B-12 and B-13.

By annual agreement between the states the Stateline flow attributed to Kansas demands for releases from JMR is calculated using a rundown period to account for the transit time between JMR and the Stateline. To determine whether the requested delivery has been met, the states further agree that no part of the daily Stateline flow exceeding 105% of Kansas' demand will be credited toward those deliveries. The total Stateline flow on days of Kansas demands, calculated pursuant to this method was 53,144 acre-feet using provisional data, subsequently adjusted to 53,122 acre-feet when USGS discharge records were finalized. The differences between quantities in Table 10 in this report and Table XI in the Oper. Sec. 89 Report reflect the fact that Table 10 reports final, corrected USGS gaged flows, while Table XI was prepared by the Operations Secretary immediately following the Compact Year when only provisional flow data was available. From this Stateline flow 44,308 acre-feet was credited as a delivery against the releases from the Kansas account.

| <b>TABLE 9</b><br><b>JOHN MARTIN RESERVOIR</b><br><b>KANSAS ACCOUNT OPERATION (AF)</b><br><b>COMPACT YEAR 1989</b> |                                       |                                    |                    |                                  |                                     |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------|--------------------|----------------------------------|-------------------------------------|
| <u>Month</u>                                                                                                       | <u>Contents</u><br><u>Begin Month</u> | <u>Inflow to</u><br><u>Storage</u> | <u>Evaporation</u> | <u>Storage</u><br><u>Release</u> | <u>Contents</u><br><u>End Month</u> |
| Nov. '88                                                                                                           | 26,230.93                             | 0.00                               | 315.97             | 0.00                             | 25,914.96                           |
| Dec.                                                                                                               | 25,914.96                             | 1,944.21                           | 186.94             | 0.00                             | 27,672.23                           |
| Jan. '89                                                                                                           | 27,672.23                             | 0.00                               | 47.77              | 0.00                             | 27,624.46                           |
| Feb.                                                                                                               | 27,624.46                             | 0.00                               | 42.75              | 0.00                             | 27,581.71                           |
| Mar.                                                                                                               | 27,581.71                             | 0.00                               | 503.24             | 0.00                             | 27,078.47                           |
| Winter subtotal                                                                                                    |                                       | 1,944.21                           | 1,096.67           | 0.00                             |                                     |
| Apr.                                                                                                               | 27,078.47                             | 11,356.16                          | 944.95             | 0.00                             | 37,489.68                           |
| May                                                                                                                | 37,489.68                             | 3,434.37                           | 1,146.75           | 5,702.57                         | 34,074.73                           |
| June                                                                                                               | 34,074.73                             | 1,095.39                           | 1,113.93           | 0.00                             | 34,056.19                           |
| July                                                                                                               | 34,056.19                             | 0.00                               | 1,558.13           | 11,520.83                        | 20,977.23                           |
| Aug.                                                                                                               | 20,977.23                             | 0.00                               | 640.11             | 9,818.33                         | 10,518.79                           |
| Sept.                                                                                                              | 10,518.79                             | 0.00                               | 435.13             | 0.00                             | 10,083.66                           |
| Oct. '89                                                                                                           | 10,083.66                             | 0.00                               | 200.72             | 4,958.79                         | 4,924.15                            |
| Summer subtotal                                                                                                    |                                       | 15,885.92                          | 6,039.72           | 32,000.52                        |                                     |
| Year Total                                                                                                         |                                       | 17,830.13                          | 7,136.39           | 32,000.52                        |                                     |

**NOTES**

[1] Source: Oper. Sec. 89 Report, Table XI (revised), monthly accounting sheets.

**TABLE 10**  
**JOHN MARTIN RESERVOIR**  
**KANSAS DEMANDS and RELEASES [AF]**  
**COMPACT YEAR 1989**

| <u>Month</u>    | <u>Demand/<br/>Release</u> | <u>Transit Loss<br/>Acct. Release</u> | <u>Stateline<br/>Flow</u> | <u>Credited<br/>Delivery</u> |
|-----------------|----------------------------|---------------------------------------|---------------------------|------------------------------|
| Nov. '88        | 0.00                       | 0.00                                  | 0                         | 0                            |
| Dec.            | 0.00                       | 0.00                                  | 0                         | 0                            |
| Jan. '89        | 0.00                       | 0.00                                  | 0                         | 0                            |
| Feb.            | 0.00                       | 0.00                                  | 0                         | 0                            |
| Mar.            | <u>0.00</u>                | <u>0.00</u>                           | <u>0</u>                  | <u>0</u>                     |
| Winter subtotal | <u>0.00</u>                | <u>0.00</u>                           | <u>0</u>                  | <u>0</u>                     |
| Apr.            | 0.00                       | 0.00                                  | 0                         | 0                            |
| May             | 5,702.57                   | 842.98                                | 13,551                    | 9,981                        |
| June            | 0.00                       | 0.00                                  | 0                         | 0                            |
| July            | 11,520.83                  | 1,475.24                              | 14,363                    | 12,905                       |
| Aug.            | 9,818.33                   | 0.00                                  | 19,069                    | 15,299                       |
| Sept.           | 0.00                       | 0.00                                  | 0                         | 0                            |
| Oct. '89        | <u>4,958.79</u>            | <u>842.99</u>                         | <u>6,139</u>              | <u>6,123</u>                 |
| Summer          | <u>32,000.52</u>           | <u>3,161.21</u>                       | <u>53,122</u>             | <u>44,308</u>                |
| Year Total      | 32,000.52                  | 3,161.21                              | 53,122                    | 44,308                       |

**NOTES**

[1] Stateline flow equals sum of gaged flows (as published by USGS) at Frontier Ditch and Arkansas River at Coolidge, Kansas on days of Kansas demands, adjusted for transit times and an appropriate "rundown" period. Generally, deliveries begin 2 days after the release from JMR commences and continue for up to 7 days following the end of the release.

[2] The annual operating agreement for 1989 (dated Dec. 3, 1988) states in part:  
"3. Credit for delivery to Kansas will stop at the Stateline 7 days after the end of the run at JMR. No credit for over delivery will be carried forward to any subsequent run.

4. When the daily average flow at the Stateline exceeds the demand, delivery will be credited at not to exceed 105% of the demand."

[3] Demands at the end of month are partially satisfied by deliveries in the following month due to rundown period and transit time between JMR and the Kansas-Colorado Stateline.

[4] Source: Oper. Sec. 89 Report, Table XI.

A transit loss account release of 3,161.21 acre-feet was made to support deliveries of Kansas account water to the Stateline. Operation of the transit loss account in Compact Year 1989 is shown in Table 11, below.

| <b>TABLE 11<br/>JOHN MARTIN RESERVOIR<br/>TRANSIT LOSS ACCOUNT SUMMARY (AF)<br/>COMPACT YEAR 1989</b>                                                                                                                                                  |                                 |                              |                    |                            |                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|--------------------|----------------------------|-------------------------------|
| <u>Month</u>                                                                                                                                                                                                                                           | <u>Contents<br/>Begin Month</u> | <u>Inflow to<br/>Storage</u> | <u>Evaporation</u> | <u>Storage<br/>Release</u> | <u>Contents<br/>End Month</u> |
| Nov. '88                                                                                                                                                                                                                                               | 6,263.11                        | 0.00                         | 75.43              | 0.00                       | 6,187.68                      |
| Dec.                                                                                                                                                                                                                                                   | 6,187.68                        | 0.00                         | 1.56               | 6,186.12                   | 0.00                          |
| Jan. '89                                                                                                                                                                                                                                               | 0.00                            | 0.00                         | 0.00               | 0.00                       | 0.00                          |
| Feb.                                                                                                                                                                                                                                                   | 0.00                            | 0.00                         | 0.00               | 0.00                       | 0.00                          |
| Mar.                                                                                                                                                                                                                                                   | 0.00                            | <u>8,954.35</u>              | <u>0.00</u>        | <u>0.00</u>                | 8,954.35                      |
| Winter subtotal                                                                                                                                                                                                                                        |                                 | <u>8,954.35</u>              | <u>76.99</u>       | <u>6,186.12</u>            |                               |
| Apr.                                                                                                                                                                                                                                                   | 8,954.35                        | 46.13                        | 234.63             | 0.00                       | 8,765.85                      |
| May                                                                                                                                                                                                                                                    | 8,765.85                        | 569.65                       | 275.80             | 842.98                     | 8,216.72                      |
| June                                                                                                                                                                                                                                                   | 8,216.72                        | 0.00                         | 261.88             | 0.00                       | 7,954.84                      |
| July                                                                                                                                                                                                                                                   | 7,954.84                        | 289.99                       | 397.84             | 1,475.24                   | 6,371.75                      |
| Aug.                                                                                                                                                                                                                                                   | 6,371.75                        | 0.00                         | 309.74             | 0.00                       | 6,062.01                      |
| Sept.                                                                                                                                                                                                                                                  | 6,062.01                        | 0.00                         | 250.78             | 0.00                       | 5,811.23                      |
| Oct. '89                                                                                                                                                                                                                                               | 5,811.23                        | <u>0.00</u>                  | <u>159.40</u>      | <u>842.99</u>              | 4,808.84                      |
| Summer subtotal                                                                                                                                                                                                                                        |                                 | <u>905.77</u>                | <u>1,890.07</u>    | <u>3,161.21</u>            |                               |
| Year Total                                                                                                                                                                                                                                             |                                 | 9,860.12                     | 1,967.06           | 9,347.33                   |                               |
| NOTES                                                                                                                                                                                                                                                  |                                 |                              |                    |                            |                               |
| [1] Dec. 1988 not a physical release from storage; transferred 1,944.21AF (11/35) to Kansas account and 4,241.91 AF (24/35) to Colorado ditch accounts pursuant to Section III of the 1980 Operating Plan and the annual operating agreement for 1989. |                                 |                              |                    |                            |                               |
| [2] Source: Oper. Sec. 89 Report, Table VII.                                                                                                                                                                                                           |                                 |                              |                    |                            |                               |

Releases from agreement accounts to Colorado ditches during the 1989 Compact Year are summarized in Table 12, below.

The permanent pool at JMR received no inflow in Compact Year 1989. The pool contents declined 1,980.01 acre-feet due to evaporation. At the close of Compact Year 1989 the permanent pool contained 5,452.96 acre-feet as shown in Table 13, below.

At the close of the Compact Year on October 31, 1989 at 2400 hours the John Martin Reservoir contained 27,406.78 acre-feet, allocated as shown on Table 14, below.

**TABLE 12**  
**JOHN MARTIN RESERVOIR**  
**SUMMARY OF RELEASES TO COLORADO DITCHES (AF)**  
**COMPACT YEAR 1989**

| <u>Month</u> | <u>Release</u> |
|--------------|----------------|
| Nov.'88      | 0.00           |
| Dec.         | 0.00           |
| Jan.'89      | 0.00           |
| Feb.         | 0.00           |
| Mar.         | 3,950.50       |
| Apr.         | 27,927.34      |
| May          | 12,092.54      |
| June         | 6,088.06       |
| July         | 11,732.05      |
| Aug.         | 3,561.50       |
| Sept.        | 811.99         |
| Oct.'89      | <u>487.97</u>  |
| Totals       | 66,651.95      |

**NOTES**

- [1] Total includes release of City of Lamar's transmountain Fry-Ark water at 1769.31 AF.  
[2] Source: Oper. Sec. 89 Report, Table X.

**TABLE 13**  
**JOHN MARTIN RESERVOIR**  
**PERMANENT POOL OPERATION (AF)**  
**COMPACT YEAR 1989**

| <u>Month</u>    | <u>Contents</u><br><u>Begin Month</u> | <u>Inflow to</u><br><u>Storage</u> | <u>Evaporation</u> | <u>Storage</u><br><u>Release</u> | <u>Contents</u><br><u>End Month</u> |
|-----------------|---------------------------------------|------------------------------------|--------------------|----------------------------------|-------------------------------------|
| Nov.'88         | 7,432.97                              | 0.00                               | 89.53              | 0.00                             | 7,343.44                            |
| Dec.            | 7,343.44                              | 0.00                               | 49.41              | 0.00                             | 7,294.03                            |
| Jan.'89         | 7,294.03                              | 0.00                               | 12.61              | 0.00                             | 7,281.42                            |
| Feb.            | 7,281.42                              | 0.00                               | 11.26              | 0.00                             | 7,270.16                            |
| Mar.            | 7,270.16                              | <u>0.00</u>                        | <u>132.65</u>      | <u>0.00</u>                      | 7,137.51                            |
| Winter Subtotal |                                       | <u>0.00</u>                        | <u>295.46</u>      | <u>0.00</u>                      |                                     |
| Apr.            | 7,137.51                              | 0.00                               | 186.14             | 0.00                             | 6,951.37                            |
| May             | 6,951.37                              | 0.00                               | 226.66             | 0.00                             | 6,724.71                            |
| June            | 6,724.71                              | 0.00                               | 214.31             | 0.00                             | 6,510.40                            |
| July            | 6,510.40                              | 0.00                               | 339.02             | 0.00                             | 6,171.38                            |
| Aug.            | 6,171.38                              | 0.00                               | 300.03             | 0.00                             | 5,871.35                            |
| Sept.           | 5,871.35                              | 0.00                               | 242.91             | 0.00                             | 5,628.44                            |
| Oct.'89         | 5,628.44                              | <u>0.00</u>                        | <u>175.48</u>      | <u>0.00</u>                      | 5,452.96                            |
| Summer Subtotal |                                       | <u>0.00</u>                        | <u>1,684.55</u>    | <u>0.00</u>                      |                                     |
| Year Total      |                                       | 0.00                               | 1,980.01           | 0.00                             |                                     |

**NOTES**

- [1] Source: Oper. Sec. 89 Report, Table VIII

| <b>TABLE 14</b><br><b>JOHN MARTIN RESERVOIR</b><br><b>CONTENTS DISTRIBUTION (AF)</b><br><b>OCTOBER 31, 1989</b> |                 |                 |
|-----------------------------------------------------------------------------------------------------------------|-----------------|-----------------|
| <u>Storage Component</u>                                                                                        | <u>Subtotal</u> | <u>Contents</u> |
| Compact Water                                                                                                   |                 | 0.00            |
| Section II Agreement Accounts                                                                                   |                 |                 |
| Kansas                                                                                                          | 4,924.15        |                 |
| District 67                                                                                                     | 10,557.51       |                 |
| Transit Loss                                                                                                    | <u>4,808.84</u> |                 |
| subtotal Section II                                                                                             | 20,290.50       | 20,290.50       |
| Section III Agreement Accounts                                                                                  |                 |                 |
| Amity                                                                                                           | 1,663.32        |                 |
| Ft. Lyon                                                                                                        | 0.00            |                 |
| Las Animas Cons.                                                                                                | <u>0.00</u>     |                 |
| subtotal Section III                                                                                            | 1,663.32        | 1,663.32        |
| Flood Pool                                                                                                      |                 | 0.00            |
| Permanent Pool                                                                                                  |                 | <u>5,452.96</u> |
| Total Content                                                                                                   |                 | 27,406.78       |
| <b>NOTES</b><br>[1] Source: Oper. Sec. 89 Report, Table XIII.                                                   |                 |                 |

The final contents as determined by the Corps of Engineers was 28,283 acre-feet, rounded and reported by the USGS as 28,300 acre-feet. The difference between the volume reported by the Operations Secretary accounting and the actual measured contents, 876.22 acre-feet, was credited to the reservoir accounting as an additional inflow to conservation storage on November 1, 1989. This was the first opportunity under the Compact to add to reservoir storage and resulted in a balancing of reservoir accounting and actual contents for the beginning of Compact Year 1990.

The technical data for this section were compiled by the Colorado Water Conservation Board staff using data from the Annual Report of the Operations Secretary, the USGS, the Colorado Division of Water Resources, the Kansas Division of Water Resources, and the minutes and correspondence of the Arkansas River Compact Administration.

## **9. GAGING STATIONS**

The U.S. Geological Survey operates eight gaging stations, included in Appendix B, under their "Collection of Basic Records" program and through funding agreements with the Corps of Engineers and the Administration. For the federal fiscal year October 1, 1988 to September 30, 1989 the Administration approved a cooperative agreement with the USGS in the amount of \$22,750. The Administration contributed half of this total, an amount of \$11,375 which was used for supplemental measurements at seven gaging sites, the operation of one station (Arkansas River near Granada, Colorado), operation of a telemark gage at John Martin Dam, maintenance of radio equipment, and the preparation of records for this annual report.

In general, streamflow records of satisfactory accuracy were obtained at the Compact stations. Emphasis was again placed on obtaining more field data, particularly in the form of discharge measurements at various stages of flow. Several more measurements were made at each site than are required under the USGS' agreement with the Administration. Measurements were also made by personnel of the Colorado State Engineer which were also incorporated into the records. There were no critical problems at the stations during the year, with the exception of the continuing unstable channels and controls.

On June 30, 1970 the USGS complete record gage, Arkansas River at Garden City, Kansas, was converted to a high-flow, partial record gaging station. Until that time flow data at Garden City had been included in the Administration's annual reports. On October 1, 1986 the gage was restored to service as a complete record gaging station. The practice of reporting these flows is being resumed with this annual report and gage records for Compact Years 1987, 1988, and 1989 are included as appendices B-8a, B-8b, and B-8c in this report for completeness.

## **10. FINDINGS of FACT by the ADMINISTRATION**

There were no findings of fact made by the Administration during Compact Year 1989.

## **11. INVESTIGATIONS**

There were no investigations undertaken by the Administration during Compact Year 1989.

## **12. CHRONOLOGY of EVENTS in KANSAS v. COLORADO LITIGATION**

The following is a partial list of significant events in the ongoing lawsuit during Compact Year 1989:

| <u>DATE</u>  | <u>PARTY</u>       | <u>ITEM</u>                                                   |
|--------------|--------------------|---------------------------------------------------------------|
| Nov. 26, '88 | Colorado           | Motion re Winter Water Storage Program                        |
| Jan. 27, '89 | Kansas             | Response re Winter Water                                      |
| Jan. 30, '89 | USA                | Motion to Intervene                                           |
| Feb. 9, '89  | Special Master     | Order Granting Intervention to USA                            |
| Feb. 14, '89 | USA                | Response to Colorado Motions                                  |
| Feb. 21, '89 | U.S. Supreme Court | Order re Kansas Motion for Leave to File Amended Complaint    |
| Feb. 22, '89 | Kansas             | Brief and Motion for Leave to File Amended Complaint          |
| Mar. 15, '89 | USA                | Response to Kansas Motion for Leave to File Amended Complaint |
| May 18, '89  | Kansas             | Motion to Amend and Bifurcate Proceedings                     |
| June 2, '89  | Colorado           | Response to Kansas Motion                                     |
| June 8, '89  | USA                | Response to Kansas Motion                                     |
| July 12, '89 | Special Master     | Order re Pretrial Conference                                  |
| Sep. 15, '89 | Special Master     | Report re Winter Water Storage Motions                        |
| Sep. 19, '89 | Special Master     | Order Setting Trial Date                                      |
| Oct. 12, '89 | Special Master     | Order re Amended Complaint                                    |

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## Appendix A-1

REVISED FY 1988-89 BUDGET  
(July 1, 1988 - June 30, 1989)

### EXPENDITURES

#### A. SALARIES AND CONTRACTUAL SERVICES

|                          |            |          |
|--------------------------|------------|----------|
| 1. Treasurer             | \$ 1,000   |          |
| 2. Recording Secretary   | 1,000      |          |
| 3. Operations Secretary  | 6,100      |          |
| 4. Auditor's Fees        | 450        |          |
| 5. Court Reporter's Fees | 1,500      |          |
| 6. Payroll Taxes         | <u>350</u> | \$10,400 |

#### B. GAGING STATIONS

|                                                                         |              |          |
|-------------------------------------------------------------------------|--------------|----------|
| 1. U.S. Geological Survey Cooperative<br>Agreements for federal FY 1988 | \$10,695     |          |
| 2. St. of Colorado Satellite System                                     | <u>7,000</u> | \$17,695 |

#### C. OPERATING EXPENSES

|                                      |          |          |
|--------------------------------------|----------|----------|
| 1. Treasurer's Bond                  | \$ 100   |          |
| 2. 1986/87 Annual Reports (Printing) | 6,500    |          |
| 3. Telephone                         | 2,000    |          |
| 4. Office Supplies/Postage           | 300      |          |
| 5. Printing/Copying                  | 300      |          |
| 6. Meetings                          | 150      |          |
| 7. Travel                            | <u>0</u> | \$ 9,300 |

#### D. EQUIPMENT

0

#### E. CONTINGENCY

1,000

#### F. TOTAL

\$38,395

### INCOME

#### A. ASSESSMENTS

|                   |              |          |
|-------------------|--------------|----------|
| 1. Colorado (60%) | \$12,000     |          |
| 2. Kansas (40%)   | <u>8,000</u> | \$20,000 |

#### B. INTEREST EARNINGS

3,000

#### C. MISCELLANEOUS

0

\$23,000

### EXPENDITURES FROM SURPLUS

\$15,395

Adopted by the Arkansas River Compact Administration at its December 8, 1987  
Annual Meeting.

\_\_\_\_\_/s/\_\_\_\_\_  
Treasurer

## Appendix A-1

### REVISED FY 1989-90 BUDGET (July 1, 1989 - June 30, 1990)

#### EXPENDITURES

##### A. SALARIES AND CONTRACTUAL SERVICES

|                          |          |
|--------------------------|----------|
| 1. Treasurer             | \$ 1,000 |
| 2. Recording Secretary   | 1,000    |
| 3. Operations Secretary  | 6,100    |
| 4. Auditor's Fees        | 500      |
| 5. Court Reporter's Fees | 500      |
| 6. Payroll Taxes         | <u>0</u> |

\$ 9,100

##### B. GAGING STATIONS

|                                                                         |              |
|-------------------------------------------------------------------------|--------------|
| 1. U.S. Geological Survey Cooperative<br>Agreements for federal FY 1989 | \$11,375     |
| 2. St. of Colorado Satellite System                                     | <u>8,000</u> |

\$19,375

##### C. OPERATING EXPENSES

|                                      |            |
|--------------------------------------|------------|
| 1. Treasurer's Bond                  | \$ 100     |
| 2. 1987/88 Annual Reports (Printing) | 6,500      |
| 3. Telephone                         | 1,000      |
| 4. Office Supplies/Postage           | 400        |
| 5. Printing/Copying                  | 300        |
| 6. Meetings                          | 150        |
| 7. Travel                            | 0          |
| 8. Rent                              | <u>600</u> |

\$ 9,050

##### D. EQUIPMENT

0

##### E. CONTINGENCY

1,000

##### F. TOTAL

\$38,525

#### INCOME

##### A. ASSESSMENTS

|                   |              |
|-------------------|--------------|
| 1. Colorado (60%) | \$12,000     |
| 2. Kansas (40%)   | <u>8,000</u> |

\$20,000

##### B. INTEREST EARNINGS

2,000

##### C. MISCELLANEOUS

0

\$22,000

#### EXPENDITURES FROM SURPLUS

\$16,525

First adopted by the Arkansas River Compact Administration at its December 8, 1987  
Annual Meeting and revised at its December 13, 1988 Annual Meeting.

\_\_\_\_\_/s/\_\_\_\_\_  
Treasurer

## Appendix A-1

FY 1990-91 BUDGET  
(July 1, 1990 - June 30, 1991)

### EXPENDITURES

#### A. SALARIES AND CONTRACTUAL SERVICES

|                          |          |          |
|--------------------------|----------|----------|
| 1. Treasurer             | \$ 1,000 |          |
| 2. Recording Secretary   | 1,000    |          |
| 3. Operations Secretary  | 6,100    |          |
| 4. Auditor's Fees        | 500      |          |
| 5. Court Reporter's Fees | 500      |          |
| 6. Payroll Taxes         | <u>0</u> | \$ 9,100 |

#### B. GAGING STATIONS

|                                                                      |              |          |
|----------------------------------------------------------------------|--------------|----------|
| 1. U.S. Geological Survey Cooperative Agreements for federal FY 1990 | \$11,830     |          |
| 2. St. of Colorado Satellite System                                  | <u>8,000</u> | \$19,830 |

#### C. OPERATING EXPENSES

|                                   |            |          |
|-----------------------------------|------------|----------|
| 1. Treasurer's Bond               | \$ 100     |          |
| 2. 1989 Annual Reports (Printing) | 3,500      |          |
| 3. Telephone                      | 1,000      |          |
| 4. Office Supplies/Postage        | 400        |          |
| 5. Printing/Copying               | 300        |          |
| 6. Meetings                       | 150        |          |
| 7. Travel                         | 0          |          |
| 8. Rent                           | <u>600</u> | \$ 6,050 |

#### D. EQUIPMENT

E. CONTINGENCY 1,000

F. TOTAL \$35,980

### INCOME

#### A. ASSESSMENTS

|                   |               |          |
|-------------------|---------------|----------|
| 1. Colorado (60%) | \$15,000      |          |
| 2. Kansas (40%)   | <u>10,000</u> | \$25,000 |

#### B. INTEREST EARNINGS

C. MISCELLANEOUS 1,500

\$26,500

\$11,230

### EXPENDITURES FROM SURPLUS

Adopted by the Arkansas River Compact Administration at its December 13, 1988 Annual Meeting.

\_\_\_\_\_/s/\_\_\_\_\_  
Treasurer

**Appendix A-2**  
**AUDITORS REPORT**



Certified Public Accountants and Management Consultants

Independent Auditor's Report

We have audited the accompanying statements of assets and liabilities - cash basis of the Arkansas River Compact Administration as of June 30, 1989, and the related statements of revenue collected and expenses paid for the year then ended. These financial statements are the responsibility of the Administration'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.

As described in Note 1a, these financial statements were prepared on the basis of cash receipts and disbursements, which is a comprehensive basis of accounting other than generally accepted accounting principles.

In our opinion, the financial statements referred to above present fairly, in all material respects, the assets and liabilities - cash basis of the Arkansas River Compact Administration as of June 30, 1989, and its revenue collected and expenses paid during the year then ended, on the basis of accounting described in Note 1a.

*Farmer & Renken*

October 13, 1989

**Appendix A-2**  
**AUDITORS REPORT**

ARKANSAS RIVER COMPACT ADMINISTRATION  
STATEMENT OF ASSETS & LIABILITIES - CASH BASIS  
JUNE 30, 1989

**ASSETS:**

|                         |          |
|-------------------------|----------|
| Cash & Cash Equivalents | \$46,685 |
| Equipment               | 29,811   |
| Concrete Control        | 8,000    |
|                         | <hr/>    |
| TOTAL ASSETS            | 84,496   |

**LIABILITIES:**

|             |       |
|-------------|-------|
| Liabilities | 0     |
|             | <hr/> |

**CASH BASIS EQUITY:**

|                                       |        |
|---------------------------------------|--------|
| Expended:                             | 29,811 |
| Equipment                             | 8,000  |
| Concrete Control                      | 46,685 |
| Unexpended:                           | <hr/>  |
|                                       | 84,496 |
| TOTAL CASH BASIS EQUITY - NOTE 1a     | <hr/>  |
|                                       | 84,496 |
| TOTAL LIABILITIES & CASH BASIS EQUITY | <hr/>  |

The accompanying notes are an integral part of the statements.

**Appendix A-2**  
**AUDITORS REPORT**

ARKANSAS RIVER COMPACT ADMINISTRATION  
STATEMENT OF REVENUES COLLECTED & EXPENSES PAID  
& CHANGES IN CASH BALANCE  
FOR YEAR ENDED JUNE 30, 1989

|                                      |        |                        |
|--------------------------------------|--------|------------------------|
| CASH BALANCE, JULY 1, 1988           |        | <u>\$51,294</u>        |
| Revenues:                            |        |                        |
| Revenues from Assessments:           |        |                        |
| Colorado - 60%                       | 12,000 |                        |
| Kansas - 40%                         | 8,000  |                        |
| Interest                             | 4,184  |                        |
| TOTAL REVENUES                       |        | <u>24,184</u>          |
| EXPENSES:                            |        |                        |
| Treasurers Bond                      | 100    |                        |
| Geological Survey                    | 17,810 |                        |
| Operations Secretary                 | 2,141  |                        |
| Equipment                            | 4,193  |                        |
| Rent                                 | 600    |                        |
| Professional Fees                    | 691    |                        |
| Office Supplies and Postage          | 197    |                        |
| Printing and Copying                 | 165    |                        |
| Travel & Meetings                    | 106    |                        |
| Telephone                            | 790    |                        |
| Recording Secretary & Court Reporter | 2,000  |                        |
| TOTAL EXPENSES                       |        | <u>28,793</u>          |
| EXCESS OF EXPENSES OVER REVENUES     |        | <u>(4,609)</u>         |
| CASH BALANCE, JUNE 30, 1989          |        | <u><u>\$46,685</u></u> |

The accompanying notes are an integral part of the statements.

## Appendix A-2 AUDITORS REPORT

### ARKANSAS RIVER COMPACT ADMINISTRATION STATEMENT OF REVENUES COLLECTED & EXPENSES PAID WITH BUDGET COMPARISON FOR THE BUDGET YEAR JULY 1, 1988 TO JUNE 30, 1989

|                                      | BUDGET     | ACTUAL   | OVER (UNDER) |
|--------------------------------------|------------|----------|--------------|
| CASH BALANCE, JULY 1, 1988           | \$0        | \$51,294 | \$51,294     |
| Revenues:                            |            |          |              |
| Revenues from Assessments:           |            |          |              |
| Colorado - 60%                       | 12,000     | 12,000   | 0            |
| Kansas - 40%                         | 8,000      | 8,000    | 0            |
| Interest                             | 3,000      | 4,184    | 1,184        |
| TOTAL REVENUES                       | 23,000     | 24,184   | 1,184        |
| <br>TOTAL TO ACCOUNT FOR             | 23,000     | 75,478   | 52,478       |
| EXPENSES:                            |            |          |              |
| U. S. Geological Survey              | 17,695     | 17,810   | (115)        |
| Operations Secretary                 | 6,100      | 2,141    | 3,959        |
| Treasurers Bond                      | 100        | 100      | 0            |
| Telephone                            | 2,000      | 790      | 1,210        |
| Payroll Taxes                        | 350        | 0        | 350          |
| Recording Secretary & Court Reporter | 3,500      | 2,000    | 1,500        |
| Travel & Meeting                     | 100        | 106      | (6)          |
| Professional Fees                    | 450        | 691      | (241)        |
| Office Supplies & Postage            | 300        | 197      | 103          |
| Printing & Copying                   | 300        | 165      | 135          |
| Annual Report                        | 6,500      | 0        | 6,500        |
| Equipment                            | 0          | 4,193    | (4,193)      |
| Rent                                 | 0          | 600      | (600)        |
| Contingency                          | 1,000      | 0        | 1,000        |
| TOTAL EXPENSES                       | 38,395     | 28,793   | (9,602)      |
| CASH BALANCE, JUNE 30, 1989          | (\$15,395) | \$46,685 | \$62,080     |

The accompanying notes are an integral part of the statements.

**Appendix A-2**  
**AUDITORS REPORT**

ARKANSAS RIVER COMPACT ADMINISTRATION  
NOTES TO CASH BASIS STATEMENTS  
JUNE 30, 1989

Note 1 - Summary of significant accounting policies:

- a. The Administration maintains financial records using the cash basis of accounting. By using the cash basis of accounting, certain key accounts needed to present financial position and results of operations are omitted; examples of these accounts are accounts receivable and accounts payable.

**Appendix A-3**  
**CASH BALANCE STATEMENT**

**ARKANSAS RIVER COMPACT ADMINISTRATION**  
307 South Fifth Street  
LAMAR, COLORADO 81052

**COLORADO**  
J. WILLIAM McDONALD, Denver  
CARL BENOVA, Pueblo  
JAMES G. ROGERS, Lamar  
Treasurer

**FRANK G. COOLEY**  
Chairman and Federal Representative  
P.O. Box 96  
Mosier, Colorado 81041

**KANSAS**  
DAVID L. POPE, Topeka  
CARL E. BENTLEY, Deerfield  
Vice Chairman  
RON OLSON, Garden City

**ARKANSAS RIVER COMPACT ADMINISTRATION**

**STATEMENT OF CASH RECEIPTS & DISBURSEMENTS & CHANGE IN CASH BALANCE**

**FROM JULY 1, 1989 thru DECEMBER 11, 1989**

|                                    |             |                    |
|------------------------------------|-------------|--------------------|
| CASH BALANCE: July 1, 1989         |             | \$46,685.08        |
| RECEIPTS:                          |             |                    |
| Colorado                           | \$12,000.00 |                    |
| Kansas                             | 8,000.00    |                    |
| Interest Earned since July         | 1,605.92    |                    |
| TOTAL RECEIPTS                     |             | \$21,605.92        |
| DISBURSEMENTS:                     |             |                    |
| Treasurer's Bond                   | \$ 100.00   |                    |
| U. S. Geological Survey            | 6,990.00    |                    |
| Printing 1986 Annual Report        | 3,678.28    |                    |
| Salaries                           | 1,000.00    |                    |
| Telephone                          | 303.99      |                    |
| Office Rent                        | 300.00      |                    |
| Postage & Supplies                 | 80.00       |                    |
| Operations Secretary Account       | 2,589.24    |                    |
| Bank Charge-Checks                 | 33.04       |                    |
| TOTAL DISBURSEMENTS                |             | \$15,074.55        |
| EXCESS RECEIPTS OVER DISBURSEMENTS |             | 6,531.37           |
| CASH BALANCE: DECEMBER 11, 1989    |             | <u>\$53,216.45</u> |
| FUNDS ON HAND:                     |             |                    |
| Checking Account                   | \$ 210.08   |                    |
| Money Market Account               | 53,006.37   |                    |
| TOTAL                              |             | <u>\$53,216.45</u> |

B-1  
1989

# DISCHARGE: ARKANSAS RIVER ABOVE PUEBLO, COLORADO

B-1  
1989

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7098400  
DAILY MEAN DISCHARGE, CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

| DAY       | NOV     | DEC       | JAN   | FEB    | MAR    | APR    | MAY    | JUN    | JUL     | AUG    | SEP    | OCT    | DAY       |
|-----------|---------|-----------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|-----------|
| 1         | 220     | 110       | 110   | 118    | 290    | 578    | 430    | 1,450  | 1,410   | 1,820  | 332    | 208    | 1         |
| 2         | 212     | 110       | 110   | 225    | 291    | 576    | 408    | 1,280  | 1,440   | 1,740  | 328    | 179    | 2         |
| 3         | 219     | 110       | 111   | 280    | 339    | 511    | 379    | 1,130  | 1,610   | 1,770  | 331    | 160    | 3         |
| 4         | 243     | 110       | 111   | 260    | 365    | 468    | 377    | 1,140  | 1,740   | 1,770  | 325    | 167    | 4         |
| 5         | 253     | 110       | 111   | 260    | 365    | 499    | 392    | 1,070  | 2,020   | 1,780  | 321    | 173    | 5         |
| 6         | 253     | 110       | 112   | 260    | 302    | 587    | 346    | 904    | 2,020   | 1,720  | 275    | 179    | 6         |
| 7         | 271     | 111       | 112   | 256    | 283    | 605    | 311    | 742    | 2,030   | 1,680  | 236    | 184    | 7         |
| 8         | 309     | 111       | 112   | 191    | 343    | 645    | 306    | 720    | 2,030   | 1,560  | 224    | 184    | 8         |
| 9         | 329     | 111       | 112   | 122    | 424    | 599    | 264    | 871    | 1,970   | 1,380  | 213    | 268    | 9         |
| 10        | 313     | 111       | 112   | 200    | 569    | 658    | 286    | 1,050  | 1,980   | 1,350  | 188    | 299    | 10        |
| 11        | 301     | 111       | 112   | 329    | 627    | 678    | 478    | 1,030  | 1,890   | 1,380  | 153    | 291    | 11        |
| 12        | 301     | 112       | 112   | 329    | 627    | 674    | 659    | 938    | 1,770   | 1,350  | 199    | 291    | 12        |
| 13        | 302     | 111       | 112   | 356    | 598    | 724    | 806    | 973    | 1,970   | 1,180  | 225    | 291    | 13        |
| 14        | 267     | 112       | 112   | 356    | 605    | 791    | 904    | 1,150  | 1,910   | 1,130  | 268    | 290    | 14        |
| 15        | 100     | 112       | 112   | 344    | 652    | 860    | 880    | 1,100  | 1,670   | 1,190  | 306    | 291    | 15        |
| 16        | 99      | 112       | 112   | 345    | 561    | 826    | 698    | 874    | 1,620   | 1,170  | 315    | 304    | 16        |
| 17        | 99      | 112       | 112   | 345    | 730    | 813    | 656    | 1,070  | 1,460   | 1,070  | 280    | 293    | 17        |
| 18        | 100     | 112       | 114   | 345    | 930    | 890    | 595    | 1,400  | 1,370   | 956    | 237    | 246    | 18        |
| 19        | 100     | 112       | 114   | 345    | 921    | 860    | 427    | 1,510  | 1,180   | 866    | 203    | 219    | 19        |
| 20        | 100     | 110       | 114   | 345    | 599    | 794    | 332    | 1,530  | 985     | 782    | 200    | 223    | 20        |
| 21        | 100     | 109       | 114   | 345    | 432    | 762    | 414    | 1,440  | 992     | 751    | 241    | 225    | 21        |
| 22        | 100     | 108       | 114   | 297    | 485    | 733    | 559    | 1,340  | 1,260   | 695    | 292    | 225    | 22        |
| 23        | 100     | 110       | 114   | 268    | 469    | 767    | 730    | 1,310  | 1,410   | 553    | 308    | 226    | 23        |
| 24        | 100     | 110       | 116   | 281    | 503    | 783    | 925    | 1,210  | 1,820   | 514    | 307    | 226    | 24        |
| 25        | 100     | 110       | 116   | 288    | 613    | 784    | 1,110  | 990    | 2,060   | 536    | 282    | 226    | 25        |
| 26        | 100     | 110       | 116   | 289    | 656    | 774    | 1,130  | 861    | 2,130   | 478    | 239    | 225    | 26        |
| 27        | 101     | 110       | 117   | 290    | 551    | 772    | 926    | 806    | 2,190   | 438    | 222    | 227    | 27        |
| 28        | 100     | 110       | 118   | 289    | 377    | 740    | 701    | 1,160  | 2,180   | 469    | 215    | 228    | 28        |
| 29        | 100     | 110       | 118   | --     | 458    | 641    | 657    | 1,390  | 2,150   | 492    | 209    | 228    | 29        |
| 30        | 109     | 110       | 118   | --     | 533    | 432    | 970    | 1,400  | 2,030   | 466    | 208    | 258    | 30        |
| 31        | --      | 110       | 118   | --     | 578    | --     | 1,310  | --     | 1,960   | 392    | --     | 275    | 31        |
| TOTAL CFS | 5,401   | 3,427     | 3,518 | 7,938  | 16,076 | 20,816 | 19,367 | 33,849 | 54,247  | 33,428 | 7,680  | 7,309  | TOTAL CFS |
| TOTAL AF  | 10,710  | 6,800     | 6,960 | 15,750 | 31,890 | 41,290 | 38,410 | 67,140 | 107,600 | 96,300 | 15,230 | 14,500 | TOTAL AF  |
| THE YEAR  | 422,600 | ACRE FEET |       |        |        |        |        |        |         |        |        |        |           |

**B-2a**  
[PREVIOUSLY B-2]  
1989

**DISCHARGE: ARKANSAS RIVER AT LAS ANIMAS, COLORADO**  
U.S.G.S. PUBLISHED RECORDS, GAGING STATION #7124000  
DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-2a**  
[PREV. B-2]  
1989

| DAY       | NOV    | DEC       | JAN   | FEB   | MAR   | APR   | MAY   | JUN   | JUL    | AUG    | SEP   | OCT   | DAY       |
|-----------|--------|-----------|-------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-----------|
| 1         | 74     | 135       | 140   | 120   | 106   | 46    | 148   | 41    | 297    | 411    | 55    | 27    | 1         |
| 2         | 32     | 134       | 138   | 115   | 124   | 39    | 156   | 41    | 269    | 404    | 47    | 26    | 2         |
| 3         | 27     | 133       | 144   | 100   | 116   | 34    | 128   | 57    | 293    | 345    | 40    | 24    | 3         |
| 4         | 25     | 134       | 142   | 90    | 104   | 29    | 113   | 103   | 273    | 308    | 35    | 25    | 4         |
| 5         | 24     | 132       | 141   | 90    | 100   | 27    | 100   | 86    | 306    | 308    | 34    | 25    | 5         |
| 6         | 24     | 131       | 140   | 110   | 104   | 27    | 68    | 56    | 314    | 309    | 33    | 25    | 6         |
| 7         | 25     | 131       | 130   | 120   | 107   | 28    | 50    | 45    | 301    | 385    | 34    | 25    | 7         |
| 8         | 25     | 133       | 119   | 150   | 107   | 30    | 44    | 43    | 303    | 444    | 33    | 23    | 8         |
| 9         | 26     | 132       | 117   | 200   | 118   | 28    | 36    | 46    | 264    | 416    | 33    | 22    | 9         |
| 10        | 27     | 133       | 151   | 240   | 128   | 27    | 35    | 39    | 287    | 432    | 32    | 22    | 10        |
| 11        | 29     | 136       | 200   | 280   | 130   | 28    | 34    | 41    | 291    | 318    | 32    | 22    | 11        |
| 12        | 30     | 132       | 172   | 280   | 131   | 28    | 35    | 84    | 243    | 245    | 35    | 22    | 12        |
| 13        | 31     | 126       | 132   | 250   | 143   | 28    | 36    | 124   | 235    | 281    | 60    | 22    | 13        |
| 14        | 33     | 124       | 126   | 225   | 209   | 27    | 48    | 74    | 208    | 91     | 80    | 23    | 14        |
| 15        | 64     | 122       | 127   | 310   | 195   | 25    | 215   | 44    | 1,080  | 293    | 94    | 25    | 15        |
| 16        | 89     | 123       | 128   | 286   | 69    | 37    | 583   | 39    | 968    | 385    | 105   | 29    | 16        |
| 17        | 143    | 124       | 127   | 283   | 49    | 50    | 797   | 36    | 332    | 393    | 97    | 38    | 17        |
| 18        | 245    | 151       | 126   | 267   | 44    | 44    | 326   | 35    | 480    | 273    | 90    | 45    | 18        |
| 19        | 251    | 245       | 125   | 215   | 42    | 37    | 149   | 33    | 480    | 376    | 90    | 56    | 19        |
| 20        | 224    | 192       | 123   | 199   | 57    | 39    | 126   | 36    | 336    | 432    | 74    | 74    | 20        |
| 21        | 158    | 140       | 127   | 155   | 78    | 67    | 98    | 46    | 214    | 359    | 62    | 84    | 21        |
| 22        | 156    | 133       | 131   | 139   | 131   | 66    | 83    | 47    | 90     | 250    | 45    | 87    | 22        |
| 23        | 156    | 128       | 126   | 132   | 191   | 66    | 74    | 73    | 47     | 160    | 34    | 77    | 23        |
| 24        | 148    | 127       | 122   | 130   | 107   | 90    | 61    | 135   | 39     | 107    | 32    | 77    | 24        |
| 25        | 139    | 127       | 121   | 128   | 54    | 104   | 59    | 379   | 41     | 84     | 34    | 75    | 25        |
| 26        | 134    | 125       | 120   | 123   | 44    | 90    | 54    | 487   | 43     | 66     | 41    | 67    | 26        |
| 27        | 131    | 125       | 121   | 119   | 35    | 77    | 48    | 419   | 157    | 65     | 47    | 62    | 27        |
| 28        | 126    | 119       | 124   | 113   | 32    | 91    | 44    | 387   | 290    | 64     | 42    | 77    | 28        |
| 29        | 135    | 122       | 120   | —     | 31    | 109   | 41    | 284   | 381    | 62     | 33    | 72    | 29        |
| 30        | 133    | 155       | 118   | —     | 51    | 122   | 46    | 255   | 381    | 58     | 28    | 65    | 30        |
| 31        | —      | 143       | 120   | —     | 71    | —     | 45    | —     | 383    | 69     | —     | 75    | 31        |
| TOTAL CFS | 2,864  | 4,247     | 4,102 | 4,981 | 3,012 | 1,540 | 3,883 | 3,627 | 9,606  | 8,174  | 1,531 | 1,418 | TOTAL CFS |
| TOTAL AF  | 5,880  | 8,420     | 8,140 | 9,880 | 5,970 | 3,050 | 7,700 | 7,190 | 19,050 | 18,210 | 3,040 | 2,810 | TOTAL AF  |
| THE YEAR  | 97,140 | ACRE FEET |       |       |       |       |       |       |        |        |       |       |           |

**B-2b**  
[PREVIOUSLY B-3]  
1989

**DISCHARGE: PURGATOIRE RIVER NEAR LAS ANIMAS, COLORADO**  
B-2b  
[PREV. B-3]  
1989

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7128500  
DAILY MEAN DISCHARGE, CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

| DAY       | NOV     | DEC       | JAN   | FEB   | MAR   | APR   | MAY   | JUN   | JUL   | AUG   | SEP   | OCT   | DAY       |
|-----------|---------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|
| 1         | 19.0    | 43.0      | 30.0  | 33.0  | 60.0  | 10.0  | 6.1   | 3.5   | 15.0  | 17.0  | 2.6   | 2.6   | 1         |
| 2         | 28.0    | 43.0      | 32.0  | 25.0  | 77.0  | 9.4   | 6.2   | 3.5   | 7.2   | 157.0 | 2.3   | 2.5   | 2         |
| 3         | 23.0    | 41.0      | 33.0  | 15.0  | 57.0  | 7.8   | 5.9   | 17.0  | 5.4   | 70.0  | 1.9   | 2.9   | 3         |
| 4         | 38.0    | 36.0      | 37.0  | 10.0  | 38.0  | 8.8   | 5.4   | 18.0  | 4.9   | 9.3   | 1.9   | 3.7   | 4         |
| 5         | 26.0    | 39.0      | 43.0  | 10.0  | 32.0  | 9.0   | 5.3   | 11.0  | 5.4   | 4.6   | 2.5   | 4.1   | 5         |
| 6         | 26.0    | 39.0      | 42.0  | 10.0  | 47.0  | 8.4   | 5.4   | 7.8   | 3.5   | 4.0   | 1.8   | 7.0   | 6         |
| 7         | 21.0    | 39.0      | 34.0  | 12.0  | 57.0  | 6.7   | 5.3   | 4.0   | 4.9   | 4.3   | 1.9   | 3.8   | 7         |
| 8         | 18.0    | 36.0      | 19.0  | 15.0  | 41.0  | 5.8   | 4.1   | 4.0   | 4.0   | 2.8   | 2.8   | 3.2   | 8         |
| 9         | 18.0    | 25.0      | 20.0  | 25.0  | 35.0  | 6.3   | 5.0   | 6.8   | 3.5   | 4.6   | 2.8   | 2.9   | 9         |
| 10        | 26.0    | 27.0      | 27.0  | 30.0  | 34.0  | 7.5   | 6.2   | 8.8   | 3.0   | 4.4   | 2.6   | 2.9   | 10        |
| 11        | 37.0    | 30.0      | 25.0  | 34.0  | 35.0  | 7.6   | 5.9   | 3.9   | 2.7   | 3.7   | 3.5   | 2.6   | 11        |
| 12        | 37.0    | 32.0      | 20.0  | 35.0  | 31.0  | 6.7   | 6.6   | 5.4   | 3.1   | 4.0   | 3.9   | 2.3   | 12        |
| 13        | 34.0    | 40.0      | 16.0  | 35.0  | 32.0  | 6.8   | 6.7   | 12.0  | 3.3   | 212.0 | 7.2   | 2.5   | 13        |
| 14        | 23.0    | 46.0      | 23.0  | 30.0  | 32.0  | 6.7   | 8.3   | 7.9   | 177.0 | 263.0 | 4.1   | 5.0   | 14        |
| 15        | 24.0    | 35.0      | 25.0  | 33.0  | 47.0  | 6.0   | 16.0  | 5.6   | 147.0 | 69.0  | 4.0   | 9.0   | 15        |
| 16        | 35.0    | 30.0      | 30.0  | 40.0  | 65.0  | 6.2   | 122.0 | 5.3   | 15.0  | 19.0  | 5.8   | 16.0  | 16        |
| 17        | 29.0    | 33.0      | 30.0  | 32.0  | 37.0  | 5.7   | 339.0 | 5.1   | 7.3   | 13.0  | 2.7   | 18.0  | 17        |
| 18        | 30.0    | 42.0      | 30.0  | 30.0  | 29.0  | 5.7   | 93.0  | 6.7   | 7.4   | 45.0  | 2.0   | 20.0  | 18        |
| 19        | 36.0    | 37.0      | 30.0  | 32.0  | 17.0  | 5.8   | 62.0  | 3.0   | 5.6   | 9.6   | 2.0   | 21.0  | 19        |
| 20        | 36.0    | 44.0      | 32.0  | 35.0  | 18.0  | 6.1   | 29.0  | 2.6   | 4.2   | 13.0  | 3.8   | 22.0  | 20        |
| 21        | 39.0    | 43.0      | 33.0  | 40.0  | 14.0  | 5.7   | 12.0  | 2.9   | 3.9   | 7.1   | 3.4   | 25.0  | 21        |
| 22        | 50.0    | 37.0      | 33.0  | 42.0  | 8.3   | 5.0   | 13.0  | 11.0  | 3.4   | 3.8   | 15.0  | 27.0  | 22        |
| 23        | 49.0    | 24.0      | 32.0  | 44.0  | 9.8   | 5.0   | 7.4   | 8.5   | 3.4   | 3.4   | 5.6   | 22.0  | 23        |
| 24        | 43.0    | 24.0      | 31.0  | 47.0  | 8.3   | 4.8   | 4.4   | 3.9   | 3.4   | 3.3   | 2.9   | 21.0  | 24        |
| 25        | 41.0    | 22.0      | 32.0  | 46.0  | 8.6   | 4.5   | 3.9   | 9.2   | 3.4   | 3.2   | 5.3   | 16.0  | 25        |
| 26        | 41.0    | 20.0      | 31.0  | 43.0  | 7.4   | 5.1   | 4.4   | 98.0  | 5.3   | 2.9   | 3.7   | 20.0  | 26        |
| 27        | 46.0    | 22.0      | 27.0  | 45.0  | 7.7   | 5.8   | 4.6   | 15.0  | 3.4   | 2.4   | 2.6   | 18.0  | 27        |
| 28        | 48.0    | 16.0      | 31.0  | 50.0  | 8.3   | 5.7   | 4.2   | 8.5   | 2.7   | 3.2   | 2.7   | 18.0  | 28        |
| 29        | 49.0    | 17.0      | 33.0  | —     | 9.4   | 6.8   | 3.8   | 8.4   | 2.5   | 4.4   | 3.0   | 19.0  | 29        |
| 30        | 50.0    | 20.0      | 35.0  | —     | 12.0  | 6.0   | 3.5   | 9.4   | 2.8   | 4.0   | 2.8   | 24.0  | 30        |
| 31        | —       | 23.0      | 38.0  | —     | 13.0  | —     | 3.5   | —     | 12.0  | 2.9   | —     | 17.0  | 31        |
| TOTAL CFS | 1,020.0 | 1,007.0   | 934.0 | 878.0 | 927.8 | 197.4 | 808.8 | 316.4 | 475.7 | 971.1 | 109.0 | 381.0 | TOTAL CFS |
| TOTAL AF  | 2,020   | 2,000     | 1,850 | 1,740 | 1,840 | 392   | 1,600 | 628   | 944   | 1,930 | 216   | 756   | TOTAL AF  |
| THE YEAR  | 15,916  | ACRE FEET |       |       |       |       |       |       |       |       |       |       |           |

**B-2c**  
[PREVIOUSLY B-4]  
1989

**RIVER FLOW INTO JOHN MARTIN RESERVOIR**

SUMMATION OF U.S.G.S. PUBLISHED RECORDS, [1]  
DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1988

**B-2c**  
[PREV. B-4]  
1988

| DAY       | NOV     | DEC       | JAN   | FEB    | MAR   | APR   | MAY   | JUN   | JUL    | AUG    | SEP   | OCT   | DAY       |
|-----------|---------|-----------|-------|--------|-------|-------|-------|-------|--------|--------|-------|-------|-----------|
| 1         | 93      | 178       | 170   | 153    | 168   | 56    | 154   | 45    | 312    | 428    | 58    | 30    | 1         |
| 2         | 60      | 177       | 170   | 140    | 201   | 48    | 162   | 45    | 276    | 561    | 49    | 29    | 2         |
| 3         | 50      | 174       | 177   | 115    | 175   | 42    | 134   | 74    | 298    | 415    | 42    | 27    | 3         |
| 4         | 63      | 170       | 179   | 100    | 142   | 38    | 118   | 121   | 278    | 317    | 37    | 28    | 4         |
| 5         | 50      | 171       | 184   | 100    | 132   | 36    | 105   | 97    | 311    | 313    | 37    | 28    | 5         |
| 6         | 50      | 170       | 182   | 120    | 151   | 35    | 73    | 64    | 318    | 313    | 35    | 32    | 6         |
| 7         | 46      | 170       | 164   | 132    | 164   | 35    | 55    | 49    | 306    | 389    | 36    | 29    | 7         |
| 8         | 43      | 169       | 138   | 165    | 148   | 36    | 49    | 47    | 307    | 448    | 36    | 28    | 8         |
| 9         | 44      | 157       | 137   | 225    | 153   | 34    | 43    | 55    | 288    | 421    | 36    | 25    | 9         |
| 10        | 53      | 180       | 178   | 270    | 162   | 35    | 41    | 48    | 290    | 458    | 35    | 25    | 10        |
| 11        | 66      | 166       | 225   | 314    | 165   | 36    | 40    | 45    | 294    | 323    | 36    | 25    | 11        |
| 12        | 67      | 164       | 192   | 315    | 162   | 35    | 42    | 89    | 246    | 249    | 39    | 24    | 12        |
| 13        | 65      | 166       | 148   | 285    | 175   | 35    | 43    | 136   | 238    | 493    | 67    | 25    | 13        |
| 14        | 56      | 172       | 151   | 255    | 241   | 34    | 56    | 82    | 385    | 354    | 84    | 28    | 14        |
| 15        | 88      | 157       | 152   | 343    | 242   | 31    | 231   | 50    | 1,207  | 362    | 98    | 34    | 15        |
| 16        | 124     | 153       | 158   | 338    | 134   | 43    | 705   | 44    | 1,003  | 384    | 111   | 45    | 16        |
| 17        | 172     | 157       | 157   | 315    | 86    | 56    | 1,136 | 41    | 339    | 406    | 100   | 56    | 17        |
| 18        | 275     | 183       | 156   | 297    | 73    | 50    | 419   | 42    | 487    | 318    | 92    | 65    | 18        |
| 19        | 287     | 282       | 155   | 247    | 59    | 43    | 211   | 36    | 486    | 386    | 92    | 77    | 19        |
| 20        | 280     | 236       | 155   | 234    | 75    | 45    | 155   | 39    | 340    | 445    | 78    | 96    | 20        |
| 21        | 197     | 183       | 160   | 195    | 92    | 73    | 111   | 49    | 218    | 366    | 65    | 109   | 21        |
| 22        | 206     | 170       | 164   | 181    | 139   | 71    | 96    | 58    | 93     | 254    | 80    | 114   | 22        |
| 23        | 205     | 152       | 160   | 176    | 201   | 71    | 81    | 82    | 50     | 163    | 40    | 98    | 23        |
| 24        | 191     | 151       | 153   | 177    | 115   | 95    | 65    | 139   | 42     | 110    | 35    | 98    | 24        |
| 25        | 180     | 149       | 153   | 174    | 63    | 109   | 63    | 388   | 44     | 87     | 39    | 91    | 25        |
| 26        | 175     | 145       | 151   | 166    | 51    | 95    | 58    | 585   | 48     | 69     | 45    | 87    | 26        |
| 27        | 177     | 147       | 148   | 164    | 43    | 83    | 53    | 434   | 160    | 67     | 50    | 80    | 27        |
| 28        | 174     | 135       | 155   | 163    | 40    | 97    | 48    | 406   | 293    | 67     | 45    | 95    | 28        |
| 29        | 184     | 139       | 153   | ---    | 40    | 116   | 45    | 292   | 364    | 66     | 36    | 91    | 29        |
| 30        | 183     | 175       | 153   | ---    | 63    | 128   | 50    | 264   | 384    | 62     | 31    | 89    | 30        |
| 31        | ---     | 166       | 158   | ---    | 84    | ---   | 49    | ---   | 395    | 72     | ---   | 92    | 31        |
| TOTAL CFS | 3,884   | 5,254     | 5,035 | 5,859  | 3,940 | 1,737 | 4,692 | 3,943 | 10,082 | 9,145  | 1,640 | 1,799 | TOTAL CFS |
| TOTAL AF  | 7,700   | 10,420    | 9,990 | 11,620 | 7,810 | 3,442 | 9,300 | 7,818 | 19,984 | 18,140 | 3,256 | 3,566 | TOTAL AF  |
| THE YEAR  | 113,056 | ACRE FEET |       |        |       |       |       |       |        |        |       |       |           |

NOTES: [1] River flow into John Martin is the combined flow of the Arkansas at Las Animas [B-2a] and the Purgatoire near Las Animas [B-2b], rounded to the nearest CFS.

**B-3**  
[PREVIOUSLY B-5]  
1989

**CONTENTS JOHN MARTIN RESERVOIR**  
U.S.G.S. PRIMARY DATA, GAGING STATION # 7130000  
MIDNIGHT CONTENTS TO NEAREST ACRE FOOT [1]  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-3**  
[PREV. B-5]  
1989

| DAY                                       | NOV    | DEC    | JAN     | FEB     | MAR     | APR     | MAY    | JUN    | JUL    | AUG    | SEP    | OCT    | DAY |
|-------------------------------------------|--------|--------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|-----|
| 1                                         | 79,301 | 87,804 | 98,150  | 109,602 | 120,288 | 123,731 | 94,513 | 83,866 | 78,141 | 51,422 | 37,310 | 34,600 | 1   |
| 2                                         | 79,435 | 87,941 | 98,514  | 109,715 | 120,776 | 122,927 | 94,160 | 83,541 | 77,874 | 50,402 | 37,182 | 34,000 | 2   |
| 3                                         | 79,860 | 88,328 | 99,088  | 109,772 | 121,205 | 122,064 | 93,405 | 83,078 | 77,432 | 49,356 | 37,150 | 33,300 | 3   |
| 4                                         | 79,840 | 88,715 | 99,403  | 110,000 | 121,327 | 121,695 | 92,754 | 83,170 | 76,858 | 48,286 | 36,991 | 32,700 | 4   |
| 5                                         | 79,885 | 89,957 | 100,033 | 110,229 | 121,511 | 119,984 | 92,055 | 83,309 | 76,332 | 47,228 | 37,150 | 31,900 | 5   |
| 6                                         | 80,020 | 89,347 | 100,560 | 110,515 | 121,941 | 119,012 | 91,361 | 83,448 | 75,982 | 46,181 | 36,895 | 32,100 | 6   |
| 7                                         | 80,110 | 89,689 | 100,931 | 110,630 | 122,310 | 117,804 | 90,572 | 83,541 | 75,068 | 44,526 | 36,641 | 30,800 | 7   |
| 8                                         | 80,200 | 90,130 | 101,143 | 110,859 | 122,618 | 116,724 | 89,103 | 83,680 | 73,730 | 43,570 | 36,325 | 30,079 | 8   |
| 9                                         | 80,336 | 90,474 | 101,356 | 111,032 | 122,989 | 115,473 | 87,172 | 83,773 | 72,194 | 42,566 | 36,011 | 29,463 | 9   |
| 10                                        | 80,426 | 90,720 | 101,621 | 111,262 | 123,360 | 114,173 | 85,225 | 83,866 | 70,507 | 41,810 | 35,948 | 28,883 | 10  |
| 11                                        | 80,834 | 91,114 | 102,209 | 111,435 | 123,793 | 113,118 | 83,309 | 84,006 | 68,963 | 40,608 | 35,729 | 28,337 | 11  |
| 12                                        | 80,834 | 91,460 | 102,532 | 111,839 | 124,041 | 112,128 | 81,471 | 84,006 | 67,800 | 39,780 | 35,666 | 28,013 | 12  |
| 13                                        | 80,924 | 91,807 | 102,693 | 112,128 | 124,538 | 111,089 | 79,975 | 84,239 | 65,921 | 39,418 | 35,604 | 28,013 | 13  |
| 14                                        | 81,015 | 92,205 | 102,962 | 112,477 | 124,849 | 110,114 | 78,541 | 84,146 | 64,582 | 39,287 | 35,479 | 28,013 | 14  |
| 15                                        | 81,243 | 92,704 | 103,231 | 112,767 | 125,161 | 109,148 | 78,141 | 84,006 | 64,299 | 38,960 | 35,448 | 27,959 | 15  |
| 16                                        | 81,334 | 92,904 | 103,566 | 113,527 | 125,349 | 108,076 | 79,705 | 83,959 | 64,461 | 38,796 | 35,448 | 27,859 | 16  |
| 17                                        | 81,744 | 93,254 | 103,935 | 114,408 | 125,161 | 107,125 | 82,157 | 83,773 | 64,703 | 38,698 | 35,417 | 27,959 | 17  |
| 18                                        | 82,617 | 93,656 | 104,370 | 115,058 | 125,037 | 106,347 | 83,727 | 83,680 | 64,582 | 38,601 | 35,385 | 28,040 | 18  |
| 19                                        | 82,940 | 94,311 | 104,752 | 115,829 | 125,099 | 105,081 | 84,473 | 83,263 | 64,501 | 38,633 | 35,417 | 28,067 | 19  |
| 20                                        | 83,356 | 94,817 | 105,410 | 116,425 | 124,974 | 104,044 | 84,801 | 82,709 | 64,380 | 38,666 | 35,448 | 28,175 | 20  |
| 21                                        | 83,727 | 95,478 | 105,850 | 116,844 | 124,974 | 103,177 | 85,178 | 81,882 | 64,179 | 38,666 | 35,354 | 28,229 | 21  |
| 22                                        | 84,099 | 95,662 | 106,071 | 117,203 | 124,849 | 102,263 | 85,272 | 81,015 | 63,696 | 38,588 | 35,107 | 28,337 | 22  |
| 23                                        | 84,708 | 96,039 | 106,292 | 117,804 | 125,161 | 101,249 | 85,414 | 80,110 | 63,135 | 38,276 | 34,859 | 28,364 | 23  |
| 24                                        | 84,989 | 96,244 | 106,680 | 118,286 | 125,286 | 100,349 | 85,603 | 79,435 | 62,457 | 37,985 | 34,736 | 28,419 | 24  |
| 25                                        | 85,414 | 96,551 | 106,957 | 118,769 | 125,224 | 99,507  | 85,508 | 79,301 | 61,350 | 37,693 | 34,582 | 28,364 | 25  |
| 26                                        | 85,839 | 96,859 | 107,292 | 119,254 | 125,161 | 98,670  | 85,508 | 79,435 | 59,629 | 37,566 | 34,480 | 28,364 | 26  |
| 27                                        | 86,123 | 97,116 | 108,020 | 119,497 | 125,037 | 97,633  | 85,650 | 79,122 | 57,896 | 37,502 | 34,582 | 28,310 | 27  |
| 28                                        | 86,599 | 97,271 | 108,414 | 119,862 | 124,787 | 96,910  | 85,603 | 78,764 | 56,451 | 37,470 | 34,613 | 28,364 | 28  |
| 29                                        | 86,933 | 97,322 | 108,695 | --      | 124,849 | 96,039  | 85,508 | 78,764 | 55,100 | 37,500 | 34,582 | 28,283 | 29  |
| 30                                        | 87,220 | 97,529 | 108,921 | --      | 124,663 | 95,173  | 84,942 | 78,408 | 53,711 | 37,582 | 34,582 | 28,229 | 30  |
| 31                                        | --     | 97,839 | 109,375 | --      | 124,289 | --      | 84,427 | --     | 52,635 | 37,408 | --     | 28,283 | 31  |
| USGS PUBLISHED END OF MONTH CONTENTS [2]: |        |        |         |         |         |         |        |        |        |        |        |        |     |
|                                           | 87,300 | 97,800 | 109,000 | 120,000 | 124,000 | 95,300  | 84,400 | 78,500 | 52,800 | 37,400 | 34,600 | 28,300 |     |

NOTES: [1] Determined from elevation-capacity table placed in use Feb. 1, 1988.  
[2] Final published record rounded per USGS procedures.

B-4  
[PREV. B-4]  
1989

# OUTFLOW: ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7130500  
DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

B-4  
[PREVIOUSLY B-4]  
1989

| DAY       | NOV     | DEC       | JAN  | FEB  | MAR     | APR      | MAY      | JUN     | JUL      | AUG      | SEP     | OCT     | DAY       |
|-----------|---------|-----------|------|------|---------|----------|----------|---------|----------|----------|---------|---------|-----------|
| 1         | 6.2     | 2.8       | 2.8  | 3.6  | 3.2     | 412.0    | 526.0    | 286.0   | 404.0    | 956.0    | 87.0    | 42.0    | 1         |
| 2         | 7.3     | 2.8       | 2.8  | 3.6  | 3.2     | 412.0    | 476.0    | 286.0   | 407.0    | 947.0    | 86.0    | 236.0   | 2         |
| 3         | 7.3     | 2.8       | 2.8  | 3.6  | 3.2     | 467.0    | 457.0    | 286.0   | 443.0    | 945.0    | 84.0    | 356.0   | 3         |
| 4         | 7.3     | 2.8       | 2.8  | 3.6  | 3.2     | 532.0    | 453.0    | 121.0   | 460.0    | 911.0    | 83.0    | 352.0   | 4         |
| 5         | 7.3     | 2.8       | 2.8  | 3.6  | 3.2     | 554.0    | 453.0    | 3.7     | 478.0    | 857.0    | 112.0   | 358.0   | 5         |
| 6         | 7.3     | 2.8       | 2.8  | 3.6  | 3.2     | 554.0    | 457.0    | 3.2     | 441.0    | 853.0    | 142.0   | 354.0   | 6         |
| 7         | 7.3     | 2.8       | 2.5  | 3.6  | 3.2     | 584.0    | 457.0    | 3.2     | 661.0    | 860.0    | 150.0   | 311.0   | 7         |
| 8         | 6.9     | 2.8       | 2.8  | 3.6  | 3.2     | 616.0    | 764.0    | 3.9     | 934.0    | 843.0    | 147.0   | 312.0   | 8         |
| 9         | 6.8     | 2.8       | 2.5  | 3.6  | 3.6     | 611.0    | 1,030.0  | 3.0     | 925.0    | 837.0    | 143.0   | 311.0   | 9         |
| 10        | 6.8     | 2.8       | 2.5  | 3.6  | 3.6     | 610.0    | 1,000.0  | 2.4     | 1,020.0  | 854.0    | 145.0   | 323.0   | 10        |
| 11        | 6.8     | 2.8       | 2.5  | 3.6  | 3.6     | 595.0    | 960.0    | 2.2     | 1,050.0  | 834.0    | 143.0   | 328.0   | 11        |
| 12        | 6.8     | 2.8       | 2.5  | 3.6  | 3.6     | 568.0    | 915.0    | 28.0    | 1,010.0  | 792.0    | 107.0   | 152.0   | 12        |
| 13        | 6.8     | 2.8       | 2.5  | 3.6  | 3.6     | 538.0    | 897.0    | 83.0    | 1,010.0  | 613.0    | 107.0   | 48.0    | 13        |
| 14        | 6.8     | 2.8       | 2.5  | 3.6  | 3.6     | 532.0    | 893.0    | 94.0    | 976.0    | 473.0    | 123.0   | 49.0    | 14        |
| 15        | 6.4     | 2.8       | 2.5  | 3.6  | 64.0    | 534.0    | 866.0    | 85.0    | 784.0    | 435.0    | 111.0   | 49.0    | 15        |
| 16        | 6.3     | 2.8       | 2.5  | 3.6  | 121.0   | 547.0    | 268.0    | 92.0    | 661.0    | 410.0    | 102.0   | 48.0    | 16        |
| 17        | 6.3     | 2.5       | 2.5  | 3.6  | 134.0   | 553.0    | 189.0    | 102.0   | 509.0    | 410.0    | 103.0   | 49.0    | 17        |
| 18        | 6.3     | 2.5       | 2.5  | 3.2  | 134.0   | 560.0    | 95.0     | 102.0   | 448.0    | 381.0    | 102.0   | 54.0    | 18        |
| 19        | 6.3     | 2.5       | 2.5  | 3.2  | 134.0   | 560.0    | 4.6      | 182.0   | 488.0    | 367.0    | 102.0   | 65.0    | 19        |
| 20        | 6.3     | 2.8       | 2.5  | 3.2  | 119.0   | 560.0    | 4.4      | 289.0   | 425.0    | 369.0    | 102.0   | 80.0    | 20        |
| 21        | 6.3     | 2.8       | 2.5  | 3.2  | 113.0   | 560.0    | 4.4      | 386.0   | 342.0    | 371.0    | 121.0   | 87.0    | 21        |
| 22        | 6.3     | 2.5       | 2.5  | 3.2  | 113.0   | 542.0    | 4.4      | 450.0   | 342.0    | 367.0    | 136.0   | 87.0    | 22        |
| 23        | 5.1     | 2.5       | 2.5  | 3.2  | 113.0   | 529.0    | 3.7      | 448.0   | 340.0    | 337.0    | 137.0   | 103.0   | 23        |
| 24        | 3.2     | 2.5       | 3.5  | 3.2  | 110.0   | 540.0    | 4.0      | 443.0   | 340.0    | 306.0    | 137.0   | 113.0   | 24        |
| 25        | 3.2     | 2.5       | 4.4  | 3.2  | 105.0   | 547.0    | 4.2      | 444.0   | 630.0    | 280.0    | 98.0    | 110.0   | 25        |
| 26        | 3.2     | 2.7       | 4.4  | 3.2  | 105.0   | 544.0    | 3.9      | 496.0   | 864.0    | 140.0    | 54.0    | 110.0   | 26        |
| 27        | 3.2     | 2.8       | 3.6  | 3.2  | 108.0   | 542.0    | 3.4      | 327.0   | 878.0    | 98.0     | 42.0    | 110.0   | 27        |
| 28        | 8.9     | 2.8       | 3.6  | 3.2  | 134.0   | 540.0    | 3.3      | 252.0   | 927.0    | 68.0     | 42.0    | 110.0   | 28        |
| 29        | 8.1     | 2.8       | 3.6  | —    | 139.0   | 542.0    | 65.0     | 449.0   | 954.0    | 68.0     | 42.0    | 110.0   | 29        |
| 30        | 2.9     | 2.8       | 3.6  | —    | 129.0   | 542.0    | 276.0    | 403.0   | 945.0    | 69.0     | 42.0    | 110.0   | 30        |
| 31        | —       | 2.8       | 3.6  | —    | 258.0   | —        | 328.0    | —       | 955.0    | 79.0     | —       | 75.0    | 31        |
| TOTAL CFS | 186.0   | 84.5      | 89.8 | 96.4 | 2,180.2 | 16,328.0 | 11,665.3 | 8,168.6 | 21,052.0 | 16,073.0 | 3,133.0 | 5,001.0 | TOTAL CFS |
| TOTAL AF  | 369     | 168       | 178  | 191  | 4,320   | 32,390   | 23,140   | 12,240  | 41,760   | 31,680   | 6,210   | 9,820   | TOTAL AF  |
| THE YEAR  | 162,768 | ACRE FEET |      |      |         |          |          |         |          |          |         |         |           |

**B-5**  
[PREVIOUSLY B-7]  
1989

**DISCHARGE: ARKANSAS RIVER AT LAMAR, COLORADO**  
U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7133000  
DAILY MEAN DISCHARGE, CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-5**  
[PREV B-7]  
1989

| DAY       | NOV    | DEC       | JAN   | FEB   | MAR   | APR     | MAY     | JUN     | JUL     | AUG     | SEP   | OCT     | DAY       |
|-----------|--------|-----------|-------|-------|-------|---------|---------|---------|---------|---------|-------|---------|-----------|
| 1         | 13.0   | 33.0      | 26.0  | 30.0  | 25.0  | 39.0    | 57.0    | 40.0    | 36.0    | 965.0   | 8.0   | 11.0    | 1         |
| 2         | 13.0   | 33.0      | 26.0  | 21.0  | 25.0  | 11.0    | 56.0    | 51.0    | 22.0    | 571.0   | 7.9   | 10.0    | 2         |
| 3         | 13.0   | 33.0      | 26.0  | 16.0  | 25.0  | 21.0    | 48.0    | 59.0    | 17.0    | 491.0   | 7.8   | 220.0   | 3         |
| 4         | 13.0   | 32.0      | 26.0  | 15.0  | 28.0  | 15.0    | 48.0    | 164.0   | 23.0    | 455.0   | 7.9   | 282.0   | 4         |
| 5         | 13.0   | 32.0      | 26.0  | 15.0  | 29.0  | 32.0    | 49.0    | 88.0    | 50.0    | 437.0   | 8.5   | 285.0   | 5         |
| 6         | 13.0   | 31.0      | 28.0  | 15.0  | 26.0  | 55.0    | 55.0    | 18.0    | 97.0    | 459.0   | 21.0  | 306.0   | 6         |
| 7         | 13.0   | 30.0      | 27.0  | 17.0  | 24.0  | 45.0    | 65.0    | 16.0    | 124.0   | 457.0   | 34.0  | 254.0   | 7         |
| 8         | 13.0   | 30.0      | 25.0  | 20.0  | 23.0  | 31.0    | 129.0   | 15.0    | 511.0   | 445.0   | 36.0  | 248.0   | 8         |
| 9         | 13.0   | 30.0      | 25.0  | 24.0  | 24.0  | 33.0    | 590.0   | 14.0    | 552.0   | 424.0   | 36.0  | 245.0   | 9         |
| 10        | 13.0   | 31.0      | 27.0  | 26.0  | 27.0  | 36.0    | 646.0   | 15.0    | 580.0   | 388.0   | 38.0  | 244.0   | 10        |
| 11        | 13.0   | 31.0      | 26.0  | 31.0  | 22.0  | 33.0    | 671.0   | 16.0    | 684.0   | 423.0   | 110.0 | 251.0   | 11        |
| 12        | 13.0   | 31.0      | 22.0  | 35.0  | 21.0  | 37.0    | 674.0   | 14.0    | 637.0   | 408.0   | 72.0  | 228.0   | 12        |
| 13        | 13.0   | 30.0      | 20.0  | 33.0  | 22.0  | 26.0    | 642.0   | 14.0    | 606.0   | 369.0   | 36.0  | 47.0    | 13        |
| 14        | 13.0   | 30.0      | 20.0  | 31.0  | 21.0  | 17.0    | 644.0   | 17.0    | 499.0   | 77.0    | 20.0  | 16.0    | 14        |
| 15        | 21.0   | 27.0      | 22.0  | 30.0  | 13.0  | 14.0    | 637.0   | 19.0    | 734.0   | 43.0    | 13.0  | 10.0    | 15        |
| 16        | 34.0   | 26.0      | 24.0  | 28.0  | 21.0  | 17.0    | 269.0   | 17.0    | 120.0   | 27.0    | 12.0  | 8.8     | 16        |
| 17        | 33.0   | 27.0      | 25.0  | 27.0  | 37.0  | 28.0    | 303.0   | 17.0    | 81.0    | 14.0    | 11.0  | 8.0     | 17        |
| 18        | 33.0   | 30.0      | 25.0  | 26.0  | 28.0  | 36.0    | 104.0   | 17.0    | 141.0   | 12.0    | 10.0  | 7.4     | 18        |
| 19        | 33.0   | 31.0      | 28.0  | 28.0  | 28.0  | 40.0    | 55.0    | 18.0    | 82.0    | 11.0    | 12.0  | 7.0     | 19        |
| 20        | 33.0   | 31.0      | 30.0  | 26.0  | 8.5   | 38.0    | 23.0    | 18.0    | 53.0    | 12.0    | 12.0  | 6.4     | 20        |
| 21        | 33.0   | 30.0      | 31.0  | 26.0  | 7.4   | 42.0    | 21.0    | 16.0    | 41.0    | 11.0    | 17.0  | 5.9     | 21        |
| 22        | 33.0   | 29.0      | 33.0  | 26.0  | 7.5   | 41.0    | 19.0    | 32.0    | 62.0    | 11.0    | 12.0  | 6.0     | 22        |
| 23        | 33.0   | 29.0      | 34.0  | 25.0  | 7.9   | 33.0    | 18.0    | 55.0    | 48.0    | 11.0    | 11.0  | 6.5     | 23        |
| 24        | 33.0   | 29.0      | 32.0  | 25.0  | 7.9   | 31.0    | 17.0    | 57.0    | 47.0    | 11.0    | 10.0  | 6.6     | 24        |
| 25        | 33.0   | 29.0      | 32.0  | 24.0  | 7.8   | 42.0    | 17.0    | 58.0    | 111.0   | 9.7     | 9.7   | 6.9     | 25        |
| 26        | 33.0   | 28.0      | 33.0  | 24.0  | 7.8   | 49.0    | 16.0    | 57.0    | 505.0   | 10.0    | 9.8   | 6.5     | 26        |
| 27        | 33.0   | 26.0      | 33.0  | 24.0  | 8.0   | 54.0    | 16.0    | 132.0   | 579.0   | 11.0    | 9.9   | 7.1     | 27        |
| 28        | 32.0   | 25.0      | 34.0  | 24.0  | 8.2   | 57.0    | 15.0    | 77.0    | 604.0   | 9.6     | 12.0  | 8.3     | 28        |
| 29        | 34.0   | 25.0      | 33.0  | —     | 31.0  | 57.0    | 15.0    | 54.0    | 577.0   | 9.2     | 11.0  | 8.9     | 29        |
| 30        | 36.0   | 25.0      | 32.0  | —     | 34.0  | 54.0    | 18.0    | 107.0   | 553.0   | 8.6     | 11.0  | 9.7     | 30        |
| 31        | —      | 26.0      | 32.0  | —     | 31.0  | —       | 21.0    | —       | 532.0   | 8.1     | —     | 8.1     | 31        |
| TOTAL CFS | 702.0  | 910.0     | 866.0 | 690.0 | 636.0 | 1,064.0 | 5,960.0 | 1,290.0 | 9,319.0 | 6,499.5 | 629.5 | 2,785.2 | TOTAL CFS |
| TOTAL AF  | 1,390  | 1,800     | 1,720 | 1,370 | 1,260 | 2,110   | 11,800  | 2,560   | 18,480  | 12,890  | 1,250 | 5,520   | TOTAL AF  |
| THE YEAR  | 62,150 | ACRE FEET |       |       |       |         |         |         |         |         |       |         |           |

**B-6**  
[PREVIOUSLY B-6]  
1989

**DISCHARGE: ARKANSAS RIVER NEAR GRANADA, COLORADO**

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7134180  
DAILY MEAN DISCHARGE, CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-6**  
[PREV. B-6]  
1989

| DAY       | NOV     | DEC       | JAN     | FEB     | MAR     | APR   | MAY     | JUN     | JUL     | AUG     | SEP   | OCT     | DAY       |
|-----------|---------|-----------|---------|---------|---------|-------|---------|---------|---------|---------|-------|---------|-----------|
| 1         | 42.0    | 113.0     | 107.0   | 102.0   | 98.0    | 13.0  | 58.0    | 7.1     | 34.0    | 543.0   | 3.6   | 4.8     | 1         |
| 2         | 40.0    | 118.0     | 106.0   | 88.0    | 99.0    | 11.0  | 59.0    | 8.6     | 11.0    | 487.0   | 3.2   | 4.4     | 2         |
| 3         | 39.0    | 117.0     | 106.0   | 81.0    | 99.0    | 9.0   | 56.0    | 14.0    | 8.2     | 411.0   | 3.2   | 14.0    | 3         |
| 4         | 35.0    | 115.0     | 107.0   | 58.0    | 88.0    | 9.2   | 50.0    | 92.0    | 7.0     | 373.0   | 3.2   | 148.0   | 4         |
| 5         | 31.0    | 115.0     | 110.0   | 55.0    | 89.0    | 8.8   | 49.0    | 180.0   | 6.6     | 352.0   | 3.8   | 201.0   | 5         |
| 6         | 28.0    | 112.0     | 109.0   | 55.0    | 91.0    | 9.6   | 22.0    | 116.0   | 7.9     | 361.0   | 3.7   | 224.0   | 6         |
| 7         | 32.0    | 109.0     | 108.0   | 55.0    | 96.0    | 15.0  | 7.1     | 83.0    | 23.0    | 383.0   | 4.5   | 227.0   | 7         |
| 8         | 36.0    | 112.0     | 103.0   | 58.0    | 96.0    | 13.0  | 4.5     | 88.0    | 120.0   | 390.0   | 6.2   | 218.0   | 8         |
| 9         | 38.0    | 111.0     | 98.0    | 65.0    | 74.0    | 13.0  | 112.0   | 64.0    | 295.0   | 390.0   | 6.9   | 224.0   | 9         |
| 10        | 37.0    | 111.0     | 103.0   | 80.0    | 38.0    | 19.0  | 338.0   | 62.0    | 351.0   | 362.0   | 9.4   | 222.0   | 10        |
| 11        | 40.0    | 113.0     | 105.0   | 107.0   | 40.0    | 10.0  | 405.0   | 59.0    | 452.0   | 344.0   | 25.0  | 224.0   | 11        |
| 12        | 39.0    | 112.0     | 104.0   | 108.0   | 39.0    | 8.8   | 442.0   | 54.0    | 495.0   | 360.0   | 83.0  | 225.0   | 12        |
| 13        | 38.0    | 113.0     | 99.0    | 110.0   | 48.0    | 7.1   | 443.0   | 55.0    | 525.0   | 387.0   | 86.0  | 175.0   | 13        |
| 14        | 36.0    | 115.0     | 100.0   | 108.0   | 71.0    | 5.8   | 498.0   | 58.0    | 454.0   | 288.0   | 60.0  | 105.0   | 14        |
| 15        | 66.0    | 112.0     | 100.0   | 106.0   | 72.0    | 6.8   | 530.0   | 59.0    | 513.0   | 158.0   | 41.0  | 77.0    | 15        |
| 16        | 97.0    | 111.0     | 101.0   | 103.0   | 77.0    | 7.9   | 494.0   | 66.0    | 407.0   | 105.0   | 34.0  | 52.0    | 16        |
| 17        | 114.0   | 109.0     | 103.0   | 101.0   | 90.0    | 6.9   | 435.0   | 96.0    | 173.0   | 83.0    | 28.0  | 45.0    | 17        |
| 18        | 117.0   | 108.0     | 102.0   | 99.0    | 88.0    | 6.6   | 347.0   | 42.0    | 142.0   | 57.0    | 21.0  | 39.0    | 18        |
| 19        | 118.0   | 118.0     | 101.0   | 100.0   | 87.0    | 6.9   | 212.0   | 9.6     | 122.0   | 39.0    | 6.6   | 38.0    | 19        |
| 20        | 120.0   | 119.0     | 100.0   | 101.0   | 87.0    | 8.1   | 149.0   | 8.1     | 84.0    | 38.0    | 6.2   | 41.0    | 20        |
| 21        | 119.0   | 115.0     | 101.0   | 101.0   | 83.0    | 8.1   | 117.0   | 7.1     | 51.0    | 33.0    | 6.2   | 38.0    | 21        |
| 22        | 118.0   | 113.0     | 101.0   | 100.0   | 75.0    | 9.1   | 100.0   | 6.9     | 36.0    | 32.0    | 6.5   | 39.0    | 22        |
| 23        | 118.0   | 110.0     | 99.0    | 100.0   | 69.0    | 7.4   | 88.0    | 7.3     | 36.0    | 34.0    | 6.5   | 40.0    | 23        |
| 24        | 118.0   | 109.0     | 97.0    | 100.0   | 57.0    | 6.0   | 77.0    | 11.0    | 28.0    | 32.0    | 7.7   | 43.0    | 24        |
| 25        | 117.0   | 108.0     | 96.0    | 99.0    | 26.0    | 5.7   | 70.0    | 14.0    | 20.0    | 32.0    | 6.7   | 47.0    | 25        |
| 26        | 120.0   | 111.0     | 96.0    | 98.0    | 17.0    | 20.0  | 68.0    | 13.0    | 120.0   | 25.0    | 6.8   | 32.0    | 26        |
| 27        | 119.0   | 107.0     | 97.0    | 98.0    | 16.0    | 29.0  | 64.0    | 16.0    | 310.0   | 27.0    | 5.5   | 32.0    | 27        |
| 28        | 120.0   | 102.0     | 108.0   | 99.0    | 13.0    | 29.0  | 64.0    | 51.0    | 378.0   | 19.0    | 5.2   | 35.0    | 28        |
| 29        | 120.0   | 103.0     | 106.0   | ---     | 12.0    | 36.0  | 59.0    | 27.0    | 395.0   | 5.0     | 4.7   | 32.0    | 29        |
| 30        | 121.0   | 103.0     | 106.0   | ---     | 14.0    | 46.0  | 30.0    | 37.0    | 390.0   | 4.5     | 4.1   | 30.0    | 30        |
| 31        | ---     | 105.0     | 106.0   | ---     | 15.0    | ---   | 12.0    | ---     | 380.0   | 3.9     | ---   | 27.0    | 31        |
| TOTAL CFS | 2,333.0 | 3,450.0   | 3,187.0 | 2,515.0 | 1,987.0 | 391.8 | 5,457.6 | 1,341.7 | 6,378.7 | 6,163.4 | 498.4 | 2,904.2 | TOTAL CFS |
| TOTAL AF  | 4,630   | 6,840     | 6,320   | 4,980   | 3,900   | 777   | 10,830  | 2,680   | 12,650  | 12,230  | 988   | 5,780   | TOTAL AF  |
| THE YEAR  | 72,576  | ACRE FEET |         |         |         |       |         |         |         |         |       |         |           |

**B-7a**  
[PREVIOUSLY B-9a]  
1989

**DISCHARGE: ARKANSAS RIVER NEAR COOLIDGE, KANSAS**  
U.S.G.S. PUBLISHED RECORDS, GAGING STATION #7137500  
DAILY MEAN DISCHARGE, CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-7a**  
[PREV B-9a]  
1989

| DAY       | NOV     | DEC       | JAN    | FEB   | MAR   | APR   | MAY    | JUN   | JUL    | AUG    | SEP   | OCT   | DAY       |
|-----------|---------|-----------|--------|-------|-------|-------|--------|-------|--------|--------|-------|-------|-----------|
| 1         | 171     | 193       | 191    | 163   | 181   | 112   | 135    | 112   | 137    | 450    | 103   | 70    | 1         |
| 2         | 168     | 193       | 191    | 147   | 184   | 104   | 154    | 131   | 103    | 586    | 97    | 64    | 2         |
| 3         | 182     | 193       | 190    | 95    | 189   | 146   | 133    | 114   | 85     | 511    | 98    | 63    | 3         |
| 4         | 157     | 193       | 190    | 75    | 168   | 139   | 118    | 250   | 79     | 471    | 93    | 83    | 4         |
| 5         | 181     | 195       | 194    | 68    | 162   | 118   | 131    | 441   | 72     | 447    | 90    | 143   | 5         |
| 6         | 159     | 201       | 190    | 78    | 169   | 116   | 142    | 360   | 76     | 439    | 64    | 181   | 6         |
| 7         | 161     | 189       | 189    | 107   | 179   | 95    | 144    | 235   | 82     | 464    | 49    | 217   | 7         |
| 8         | 156     | 197       | 177    | 124   | 180   | 87    | 133    | 175   | 82     | 466    | 44    | 223   | 8         |
| 9         | 160     | 201       | 171    | 146   | 184   | 78    | 126    | 153   | 183    | 463    | 48    | 233   | 9         |
| 10        | 181     | 203       | 172    | 156   | 176   | 110   | 268    | 138   | 312    | 441    | 44    | 238   | 10        |
| 11        | 165     | 203       | 176    | 171   | 174   | 92    | 420    | 130   | 372    | 423    | 74    | 238   | 11        |
| 12        | 168     | 203       | 169    | 193   | 177   | 76    | 478    | 118   | 455    | 559    | 160   | 233   | 12        |
| 13        | 188     | 205       | 165    | 212   | 177   | 68    | 501    | 112   | 497    | 965    | 182   | 235   | 13        |
| 14        | 169     | 211       | 166    | 205   | 180   | 61    | 708    | 115   | 513    | 588    | 159   | 198   | 14        |
| 15        | 177     | 209       | 163    | 187   | 169   | 51    | 762    | 104   | 486    | 384    | 142   | 164   | 15        |
| 16        | 185     | 207       | 158    | 181   | 184   | 55    | 833    | 106   | 561    | 301    | 131   | 143   | 16        |
| 17        | 188     | 211       | 164    | 179   | 156   | 54    | 680    | 98    | 338    | 348    | 130   | 131   | 17        |
| 18        | 201     | 211       | 165    | 177   | 170   | 70    | 714    | 91    | 260    | 245    | 116   | 119   | 18        |
| 19        | 203     | 215       | 166    | 182   | 183   | 64    | 484    | 86    | 228    | 211    | 108   | 115   | 19        |
| 20        | 204     | 211       | 157    | 183   | 194   | 63    | 371    | 72    | 178    | 209    | 106   | 111   | 20        |
| 21        | 206     | 207       | 159    | 184   | 194   | 68    | 323    | 70    | 160    | 205    | 100   | 109   | 21        |
| 22        | 206     | 207       | 160    | 178   | 187   | 70    | 290    | 63    | 145    | 198    | 102   | 106   | 22        |
| 23        | 209     | 201       | 160    | 177   | 173   | 71    | 260    | 66    | 135    | 166    | 108   | 106   | 23        |
| 24        | 210     | 195       | 153    | 184   | 161   | 72    | 219    | 76    | 128    | 157    | 107   | 107   | 24        |
| 25        | 210     | 195       | 150    | 186   | 152   | 65    | 196    | 81    | 111    | 153    | 94    | 105   | 25        |
| 26        | 210     | 193       | 147    | 181   | 126   | 64    | 176    | 73    | 93     | 147    | 79    | 105   | 26        |
| 27        | 207     | 192       | 148    | 183   | 111   | 63    | 166    | 74    | 217    | 147    | 84    | 108   | 27        |
| 28        | 205     | 184       | 160    | 188   | 95    | 63    | 162    | 76    | 323    | 142    | 86    | 111   | 28        |
| 29        | 209     | 182       | 163    | —     | 91    | 97    | 151    | 88    | 374    | 135    | 77    | 111   | 29        |
| 30        | 207     | 179       | 166    | —     | 103   | 121   | 132    | 105   | 407    | 120    | 72    | 109   | 30        |
| 31        | —       | 181       | 167    | —     | 108   | —     | 114    | —     | 428    | 109    | —     | 114   | 31        |
| TOTAL CFS | 5,523   | 6,170     | 5,237  | 4,490 | 5,017 | 2,513 | 9,614  | 3,913 | 7,621  | 10,628 | 2,947 | 4,393 | TOTAL CFS |
| TOTAL AF  | 10,950  | 12,240    | 10,390 | 8,910 | 9,950 | 4,980 | 19,070 | 7,760 | 15,120 | 21,080 | 5,850 | 8,710 | TOTAL AF  |
| THE YEAR  | 135,010 | ACRE FEET |        |       |       |       |        |       |        |        |       |       |           |

**B-7b**  
[PREVIOUSLY B-9b]  
1989

**DISCHARGE: FRONTIER DITCH NEAR COOLIDGE, KANSAS**

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7137000  
DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-7b**  
[PREV B-9b]  
1989

| DAY       | NOV    | DEC       | JAN | FEB | MAR | APR     | MAY   | JUN   | JUL     | AUG   | SEP   | OCT   | DAY       |
|-----------|--------|-----------|-----|-----|-----|---------|-------|-------|---------|-------|-------|-------|-----------|
| 1         | 33.0   | 0.0       | 0.0 | 0.0 | 0.0 | 0.0     | 41.0  | 13.0  | 34.0    | 34.0  | 15.0  | 24.0  | 1         |
| 2         | 36.0   | 0.0       | 0.0 | 0.0 | 0.0 | 0.0     | 36.0  | 26.0  | 34.0    | 42.0  | 15.0  | 19.0  | 2         |
| 3         | 28.0   | 0.0       | 0.0 | 0.0 | 0.0 | 0.0     | 34.0  | 21.0  | 21.0    | 37.0  | 14.0  | 19.0  | 3         |
| 4         | 26.0   | 0.0       | 0.0 | 0.0 | 0.0 | 0.0     | 30.0  | 28.0  | 19.0    | 33.0  | 13.0  | 24.0  | 4         |
| 5         | 14.0   | 0.0       | 0.0 | 0.0 | 0.0 | 0.0     | 11.0  | 7.8   | 15.0    | 32.0  | 23.0  | 27.0  | 5         |
| 6         | 7.5    | 0.0       | 0.0 | 0.0 | 0.0 | 24.0    | 0.1   | 8.5   | 21.0    | 34.0  | 41.0  | 30.0  | 6         |
| 7         | 11.0   | 0.0       | 0.0 | 0.0 | 0.0 | 33.0    | 0.0   | 13.0  | 18.0    | 38.0  | 45.0  | 32.0  | 7         |
| 8         | 23.0   | 0.0       | 0.0 | 0.0 | 0.0 | 35.0    | 0.0   | 20.0  | 17.0    | 36.0  | 49.0  | 29.0  | 8         |
| 9         | 28.0   | 0.0       | 0.0 | 0.0 | 0.0 | 48.0    | 0.0   | 22.0  | 40.0    | 36.0  | 50.0  | 31.0  | 9         |
| 10        | 26.0   | 0.0       | 0.0 | 0.0 | 0.0 | 52.0    | 0.0   | 20.0  | 41.0    | 37.0  | 48.0  | 25.0  | 10        |
| 11        | 27.0   | 0.0       | 0.0 | 0.0 | 0.0 | 51.0    | 0.0   | 20.0  | 41.0    | 46.0  | 44.0  | 22.0  | 11        |
| 12        | 27.0   | 0.0       | 0.0 | 0.0 | 0.0 | 50.0    | 0.0   | 18.0  | 48.0    | 50.0  | 26.0  | 22.0  | 12        |
| 13        | 25.0   | 0.0       | 0.0 | 0.0 | 0.0 | 50.0    | 0.0   | 17.0  | 49.0    | 28.0  | 0.0   | 21.0  | 13        |
| 14        | 24.0   | 0.0       | 0.0 | 0.0 | 0.0 | 53.0    | 0.0   | 18.0  | 49.0    | 0.9   | 0.0   | 10.0  | 14        |
| 15        | 15.0   | 0.0       | 0.0 | 0.0 | 0.0 | 56.0    | 0.3   | 25.0  | 55.0    | 0.8   | 0.0   | 11.0  | 15        |
| 16        | 0.6    | 0.0       | 0.0 | 0.0 | 0.0 | 60.0    | 0.4   | 28.0  | 53.0    | 0.4   | 0.0   | 13.0  | 16        |
| 17        | 0.4    | 0.0       | 0.0 | 0.0 | 0.0 | 55.0    | 0.2   | 30.0  | 48.0    | 0.3   | 0.0   | 14.0  | 17        |
| 18        | 0.2    | 0.0       | 0.0 | 0.0 | 0.0 | 48.0    | 0.0   | 24.0  | 46.0    | 0.2   | 0.0   | 18.0  | 18        |
| 19        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 46.0    | 0.0   | 18.0  | 47.0    | 0.0   | 0.0   | 18.0  | 19        |
| 20        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 48.0    | 0.0   | 13.0  | 43.0    | 0.0   | 0.0   | 17.0  | 20        |
| 21        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 47.0    | 0.0   | 12.0  | 36.0    | 0.0   | 0.0   | 17.0  | 21        |
| 22        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 45.0    | 0.0   | 23.0  | 28.0    | 0.0   | 0.0   | 16.0  | 22        |
| 23        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 47.0    | 8.5   | 17.0  | 24.0    | 0.0   | 0.0   | 16.0  | 23        |
| 24        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 47.0    | 18.0  | 18.0  | 22.0    | 0.0   | 0.0   | 16.0  | 24        |
| 25        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 45.0    | 17.0  | 15.0  | 32.0    | 0.0   | 9.0   | 15.0  | 25        |
| 26        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 47.0    | 17.0  | 14.0  | 46.0    | 0.0   | 24.0  | 14.0  | 26        |
| 27        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 50.0    | 16.0  | 13.0  | 51.0    | 0.0   | 21.0  | 13.0  | 27        |
| 28        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 49.0    | 13.0  | 15.0  | 42.0    | 4.3   | 18.0  | 14.0  | 28        |
| 29        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 52.0    | 14.0  | 21.0  | 39.0    | 11.0  | 22.0  | 15.0  | 29        |
| 30        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 47.0    | 16.0  | 30.0  | 38.0    | 14.0  | 24.0  | 15.0  | 30        |
| 31        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0     | 13.0  | 0.0   | 33.0    | 16.0  | 0.0   | 16.0  | 31        |
| TOTAL CFS | 351.6  | 0.0       | 0.0 | 0.0 | 0.0 | 1,187.0 | 285.5 | 576.3 | 1,122.0 | 530.6 | 501.0 | 593.0 | TOTAL CFS |
| TOTAL AF  | 687    | 0         | 0   | 0   | 0   | 2,350   | 566   | 1,140 | 2,230   | 1,050 | 994   | 1,180 | TOTAL AF  |
| THE YEAR  | 10,207 | ACRE FEET |     |     |     |         |       |       |         |       |       |       |           |

**B-7c**  
[PREVIOUSLY B-8c]  
1889

**STATELINE FLOW**  
SUMMATION OF U.S.G.S. PUBLISHED RECORDS. [1]  
DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1889

**B-7c**  
[PREV B-9c]  
1889

| DAY       | NOV     | DEC       | JAN    | FEB   | MAR   | APR   | MAY    | JUN   | JUL    | AUG    | SEP   | OCT   | DAY       |
|-----------|---------|-----------|--------|-------|-------|-------|--------|-------|--------|--------|-------|-------|-----------|
| 1         | 204     | 193       | 191    | 163   | 181   | 112   | 176    | 125   | 171    | 484    | 118   | 94    | 1         |
| 2         | 204     | 193       | 191    | 147   | 184   | 104   | 190    | 165   | 129    | 628    | 112   | 83    | 2         |
| 3         | 190     | 193       | 190    | 95    | 189   | 148   | 167    | 135   | 106    | 548    | 112   | 82    | 3         |
| 4         | 183     | 193       | 190    | 75    | 188   | 139   | 148    | 278   | 98     | 504    | 106   | 107   | 4         |
| 5         | 175     | 195       | 194    | 68    | 162   | 118   | 142    | 449   | 87     | 479    | 113   | 170   | 5         |
| 6         | 167     | 201       | 190    | 78    | 169   | 140   | 142    | 369   | 97     | 473    | 105   | 211   | 6         |
| 7         | 172     | 199       | 189    | 107   | 179   | 128   | 144    | 248   | 100    | 502    | 94    | 249   | 7         |
| 8         | 179     | 197       | 177    | 124   | 180   | 122   | 133    | 195   | 99     | 502    | 93    | 252   | 8         |
| 9         | 188     | 201       | 171    | 146   | 184   | 126   | 126    | 175   | 223    | 498    | 98    | 264   | 9         |
| 10        | 187     | 203       | 172    | 156   | 178   | 162   | 268    | 158   | 353    | 478    | 92    | 283   | 10        |
| 11        | 192     | 203       | 176    | 171   | 174   | 143   | 420    | 150   | 413    | 469    | 118   | 260   | 11        |
| 12        | 195     | 203       | 169    | 193   | 177   | 126   | 478    | 136   | 503    | 609    | 186   | 255   | 12        |
| 13        | 193     | 205       | 165    | 212   | 177   | 118   | 501    | 129   | 546    | 993    | 182   | 256   | 13        |
| 14        | 193     | 211       | 166    | 205   | 180   | 114   | 708    | 133   | 562    | 569    | 159   | 208   | 14        |
| 15        | 192     | 209       | 183    | 187   | 169   | 109   | 762    | 129   | 541    | 385    | 142   | 175   | 15        |
| 16        | 186     | 207       | 188    | 181   | 164   | 115   | 833    | 134   | 614    | 301    | 131   | 156   | 16        |
| 17        | 188     | 211       | 164    | 179   | 156   | 109   | 890    | 128   | 386    | 348    | 130   | 145   | 17        |
| 18        | 201     | 211       | 165    | 177   | 170   | 118   | 714    | 115   | 308    | 245    | 116   | 137   | 18        |
| 19        | 203     | 215       | 166    | 182   | 183   | 110   | 484    | 104   | 275    | 211    | 108   | 133   | 19        |
| 20        | 204     | 211       | 167    | 183   | 184   | 111   | 371    | 85    | 221    | 209    | 106   | 128   | 20        |
| 21        | 206     | 207       | 159    | 184   | 194   | 115   | 323    | 82    | 196    | 205    | 100   | 126   | 21        |
| 22        | 206     | 207       | 160    | 178   | 187   | 115   | 290    | 86    | 173    | 196    | 102   | 122   | 22        |
| 23        | 209     | 201       | 160    | 177   | 173   | 118   | 259    | 83    | 159    | 166    | 108   | 122   | 23        |
| 24        | 210     | 195       | 153    | 184   | 161   | 119   | 237    | 94    | 150    | 157    | 107   | 123   | 24        |
| 25        | 210     | 195       | 150    | 186   | 152   | 110   | 213    | 96    | 143    | 153    | 103   | 120   | 25        |
| 26        | 210     | 193       | 147    | 181   | 126   | 111   | 183    | 87    | 139    | 147    | 103   | 119   | 26        |
| 27        | 207     | 192       | 148    | 183   | 111   | 113   | 182    | 87    | 268    | 147    | 105   | 121   | 27        |
| 28        | 205     | 184       | 160    | 188   | 95    | 112   | 175    | 91    | 365    | 146    | 104   | 125   | 28        |
| 29        | 209     | 182       | 163    | —     | 91    | 149   | 165    | 109   | 413    | 146    | 99    | 126   | 29        |
| 30        | 207     | 179       | 166    | —     | 103   | 168   | 148    | 135   | 443    | 134    | 96    | 124   | 30        |
| 31        | —       | 181       | 167    | —     | 108   | —     | 127    | —     | 462    | 125    | —     | 130   | 31        |
| TOTAL CFS | 5,875   | 6,170     | 5,237  | 4,480 | 5,017 | 3,700 | 9,899  | 4,489 | 8,743  | 11,159 | 3,448 | 4,986 | TOTAL CFS |
| TOTAL AF  | 11,647  | 12,240    | 10,390 | 8,910 | 9,950 | 7,330 | 19,636 | 8,900 | 17,350 | 22,130 | 6,844 | 9,890 | TOTAL AF  |
| THE YEAR  | 145,217 | ACRE FEET |        |       |       |       |        |       |        |        |       |       |           |

NOTES [1] The daily stateline flow is the sum of the flow of the Arkansas near Coolidge, Kansas [B-7a] and flow in the Frontier Ditch near Coolidge [B-7b], rounded to the nearest CFS.

**B-8a**  
1947  
(IN 88 REPORT)

# **DISCHARGE: ARKANSAS RIVER AT GARDEN CITY, KANSAS**

**B-8a**  
1947  
(IN 88 REPORT)

U.S.G.S. PUBLISHED RECORDS, GAGING STATION # 7138000 (1)  
DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
REPORT YEAR ENDING OCTOBER 31, 1987

**B-8a**  
1987  
(89 REPORT)

| COMPACT YEAR 1987 |         |           |         |         |         |          |          |          |          |       |         |
|-------------------|---------|-----------|---------|---------|---------|----------|----------|----------|----------|-------|---------|
| DAY               | NOV     | DEC       | JAN     | FEB     | MAR     | APR      | MAY      | JUN      | JUL      | AUG   | SEP     |
| 1                 | 204.0   | 164.0     | 121.0   | 91.0    | 103.0   | 404.0    | 248.0    | 1,850.0  | 1,600.0  | 1.1   | 67.0    |
| 2                 | 223.0   | 160.0     | 121.0   | 90.0    | 106.0   | 510.0    | 116.0    | 1,360.0  | 1,790.0  | 1.1   | 72.0    |
| 3                 | 229.0   | 155.0     | 115.0   | 89.0    | 103.0   | 679.0    | 37.0     | 1,590.0  | 1,380.0  | 6.7   | 85.0    |
| 4                 | 227.0   | 153.0     | 116.0   | 88.0    | 102.0   | 1,050.0  | 21.0     | 1,920.0  | 1,280.0  | 19.0  | 121.0   |
| 5                 | 227.0   | 157.0     | 118.0   | 88.0    | 102.0   | 966.0    | 17.0     | 2,080.0  | 1,290.0  | 89.0  | 119.0   |
| 6                 | 229.0   | 159.0     | 121.0   | 87.0    | 102.0   | 880.0    | 17.0     | 2,100.0  | 1,030.0  | 72.0  | 92.0    |
| 7                 | 222.0   | 157.0     | 115.0   | 87.0    | 103.0   | 800.0    | 37.0     | 2,040.0  | 608.0    | 47.0  | 59.0    |
| 8                 | 216.0   | 159.0     | 113.0   | 83.0    | 103.0   | 783.0    | 64.0     | 1,940.0  | 656.0    | 40.0  | 37.0    |
| 9                 | 206.0   | 157.0     | 113.0   | 86.0    | 98.0    | 684.0    | 116.0    | 1,750.0  | 592.0    | 21.0  | 24.0    |
| 10                | 198.0   | 155.0     | 115.0   | 94.0    | 91.0    | 600.0    | 287.0    | 1,740.0  | 505.0    | 11.0  | 11.0    |
| 11                | 182.0   | 155.0     | 132.0   | 90.0    | 86.0    | 853.0    | 609.0    | 1,030.0  | 439.0    | 10.0  | 55.0    |
| 12                | 190.0   | 153.0     | 113.0   | 88.0    | 63.0    | 853.0    | 1,050.0  | 633.0    | 464.0    | 11.0  | 64.0    |
| 13                | 189.0   | 143.0     | 110.0   | 88.0    | 60.0    | 694.0    | 1,750.0  | 861.0    | 497.0    | 2.5   | 82.0    |
| 14                | 187.0   | 148.0     | 110.0   | 91.0    | 54.0    | 573.0    | 1,800.0  | 1,100.0  | 498.0    | 0.0   | 147.0   |
| 15                | 182.0   | 144.0     | 104.0   | 94.0    | 54.0    | 541.0    | 1,800.0  | 1,220.0  | 502.0    | 0.0   | 74.0    |
| 16                | 182.0   | 144.0     | 100.0   | 91.0    | 64.0    | 492.0    | 1,820.0  | 1,260.0  | 404.0    | 0.0   | 66.0    |
| 17                | 178.0   | 149.0     | 95.0    | 91.0    | 64.0    | 547.0    | 1,890.0  | 1,310.0  | 306.0    | 0.0   | 50.0    |
| 18                | 176.0   | 148.0     | 92.0    | 92.0    | 63.0    | 628.0    | 1,970.0  | 1,370.0  | 252.0    | 0.0   | 46.0    |
| 19                | 184.0   | 146.0     | 90.0    | 94.0    | 62.0    | 718.0    | 1,950.0  | 1,650.0  | 212.0    | 0.0   | 58.0    |
| 20                | 184.0   | 142.0     | 88.0    | 94.0    | 82.0    | 871.0    | 1,950.0  | 1,950.0  | 187.0    | 0.0   | 78.0    |
| 21                | 182.0   | 139.0     | 86.0    | 96.0    | 82.0    | 946.0    | 1,970.0  | 2,130.0  | 157.0    | 1.3   | 82.0    |
| 22                | 178.0   | 137.0     | 85.0    | 95.0    | 94.0    | 791.0    | 2,160.0  | 2,400.0  | 101.0    | 1.3   | 68.0    |
| 23                | 173.0   | 137.0     | 83.0    | 92.0    | 95.0    | 718.0    | 2,170.0  | 2,290.0  | 68.0     | 0.0   | 61.0    |
| 24                | 168.0   | 137.0     | 81.0    | 88.0    | 99.0    | 791.0    | 2,290.0  | 2,300.0  | 36.0     | 0.0   | 63.0    |
| 25                | 168.0   | 134.0     | 80.0    | 86.0    | 88.0    | 1,040.0  | 2,440.0  | 2,250.0  | 26.0     | 0.0   | 63.0    |
| 26                | 162.0   | 132.0     | 79.0    | 90.0    | 88.0    | 1,340.0  | 2,540.0  | 2,300.0  | 22.0     | 0.0   | 76.0    |
| 27                | 159.0   | 132.0     | 80.0    | 96.0    | 90.0    | 1,580.0  | 2,590.0  | 2,280.0  | 35.0     | 2.4   | 100.0   |
| 28                | 159.0   | 132.0     | 82.0    | 89.0    | 94.0    | 937.0    | 2,680.0  | 2,210.0  | 29.0     | 31.0  | 111.0   |
| 29                | 162.0   | 132.0     | 84.0    | --      | 47.0    | 541.0    | 2,740.0  | 1,890.0  | 15.0     | 52.0  | 102.0   |
| 30                | 168.0   | 132.0     | 86.0    | --      | 40.0    | 366.0    | 2,620.0  | 1,610.0  | 13.0     | 59.0  | 91.0    |
| 31                | --      | 121.0     | 90.0    | --      | 365.0   | --       | 2,530.0  | --       | 4.0      | 65.0  | --      |
| TOTAL CFS         | 5,707.0 | 4,513.0   | 3,118.0 | 2,538.0 | 2,827.0 | 23,386.0 | 44,190.0 | 52,424.0 | 15,199.0 | 543.4 | 2,225.0 |
| TOTAL AF          | 11,320  | 8,960     | 6,180   | 5,030   | 5,610   | 46,390   | 87,650   | 104,000  | 30,150   | 1,080 | 4,410   |
| THE YEAR          | 315,780 | ACRE FEET |         |         |         |          |          |          |          |       |         |

NOTE: Data from this gage was historically included in the ARCA Annual Report until the complete record gage was converted to a high-flow, partial-record gaging station on June 30, 1970. On October 1, 1986 the gage was restored to a complete record gaging station. This report resumes the practice of reporting the Garden City flow. Flows for Compact Years 1987 and 1988 are included for completeness.

**B-8b** **DISCHARGE: ARKANSAS RIVER AT GARDEN CITY, KANSAS** **B-8b**  
 1988 U.S.S. PUBLISHED RECORDS, GAGING STATION # 713000 [1] 1988  
 (IN 88 REPORT) DAILY MEAN DISCHARGE, CUBIC FEET PER SECOND [88 REPORT]

REPORT YEAR ENDING OCTOBER 31, 1988  
 COMPACT YEAR 1988

| DAY       | NOV     | DEC       | JAN     | FEB     | MAR     | APR     | MAY   | JUN     | JUL | AUG | SEP     | OCT  | DAY       |
|-----------|---------|-----------|---------|---------|---------|---------|-------|---------|-----|-----|---------|------|-----------|
| 1         | 83.0    | 194.0     | 170.0   | 190.0   | 190.0   | 60.0    | 0.0   | 82.0    | 0.0 | 0.0 | 0.0     | 27.0 | 1         |
| 2         | 99.0    | 178.0     | 180.0   | 185.0   | 182.0   | 163.0   | 0.0   | 286.0   | 0.0 | 0.0 | 0.0     | 18.0 | 2         |
| 3         | 112.0   | 180.0     | 155.0   | 185.0   | 175.0   | 214.0   | 0.0   | 302.0   | 0.0 | 0.0 | 0.0     | 15.0 | 3         |
| 4         | 122.0   | 181.0     | 150.0   | 185.0   | 167.0   | 244.0   | 0.2   | 275.0   | 0.0 | 0.0 | 0.0     | 11.0 | 4         |
| 5         | 105.0   | 188.0     | 145.0   | 180.0   | 160.0   | 252.0   | 3.8   | 246.0   | 0.0 | 0.0 | 0.0     | 8.2  | 5         |
| 6         | 70.0    | 187.0     | 150.0   | 180.0   | 163.0   | 249.0   | 7.2   | 239.0   | 0.0 | 0.0 | 0.0     | 5.8  | 6         |
| 7         | 84.0    | 188.0     | 140.0   | 180.0   | 163.0   | 154.0   | 4.9   | 232.0   | 0.0 | 0.0 | 0.0     | 1.5  | 7         |
| 8         | 56.0    | 192.0     | 135.0   | 180.0   | 148.0   | 69.0    | 2.9   | 230.0   | 0.0 | 0.0 | 0.0     | 0.0  | 8         |
| 9         | 91.0    | 186.0     | 130.0   | 180.0   | 134.0   | 11.0    | 2.0   | 205.0   | 0.0 | 0.0 | 0.0     | 0.0  | 9         |
| 10        | 83.0    | 187.0     | 120.0   | 180.0   | 73.0    | 6.6     | 1.4   | 165.0   | 0.0 | 0.0 | 0.0     | 0.0  | 10        |
| 11        | 72.0    | 185.0     | 115.0   | 180.0   | 41.0    | 5.1     | 0.4   | 143.0   | 0.0 | 0.0 | 0.0     | 0.0  | 11        |
| 12        | 71.0    | 184.0     | 115.0   | 185.0   | 35.0    | 3.2     | 0.0   | 132.0   | 0.0 | 0.0 | 0.0     | 0.0  | 12        |
| 13        | 73.0    | 185.0     | 120.0   | 195.0   | 26.0    | 2.2     | 0.0   | 129.0   | 0.0 | 0.0 | 0.0     | 0.0  | 13        |
| 14        | 74.0    | 191.0     | 125.0   | 210.0   | 20.0    | 0.8     | 0.0   | 129.0   | 0.0 | 0.0 | 0.0     | 0.0  | 14        |
| 15        | 70.0    | 190.0     | 130.0   | 220.0   | 18.0    | 0.1     | 0.0   | 116.0   | 0.0 | 0.0 | 0.0     | 0.0  | 15        |
| 16        | 77.0    | 185.0     | 130.0   | 218.0   | 21.0    | 0.8     | 0.0   | 56.0    | 0.0 | 0.0 | 29.0    | 0.0  | 16        |
| 17        | 117.0   | 175.0     | 130.0   | 205.0   | 55.0    | 2.8     | 0.0   | 40.0    | 0.0 | 0.0 | 174.0   | 0.0  | 17        |
| 18        | 124.0   | 170.0     | 125.0   | 204.0   | 115.0   | 1.8     | 0.0   | 23.0    | 0.0 | 0.0 | 298.0   | 0.0  | 18        |
| 19        | 75.0    | 170.0     | 125.0   | 187.0   | 93.0    | 0.5     | 0.0   | 13.0    | 0.0 | 0.0 | 308.0   | 0.0  | 19        |
| 20        | 62.0    | 170.0     | 125.0   | 195.0   | 116.0   | 0.0     | 0.0   | 9.1     | 0.0 | 0.0 | 292.0   | 0.0  | 20        |
| 21        | 84.0    | 165.0     | 130.0   | 186.0   | 127.0   | 0.0     | 0.0   | 6.2     | 0.0 | 0.0 | 268.0   | 0.0  | 21        |
| 22        | 150.0   | 165.0     | 135.0   | 190.0   | 137.0   | 0.0     | 0.0   | 4.3     | 0.0 | 0.0 | 248.0   | 0.0  | 22        |
| 23        | 167.0   | 170.0     | 140.0   | 182.0   | 134.0   | 0.0     | 0.0   | 1.9     | 0.0 | 0.0 | 238.0   | 0.0  | 23        |
| 24        | 177.0   | 175.0     | 150.0   | 182.0   | 129.0   | 0.0     | 3.2   | 0.0     | 0.0 | 0.0 | 240.0   | 0.0  | 24        |
| 25        | 177.0   | 175.0     | 160.0   | 196.0   | 126.0   | 0.0     | 4.5   | 0.0     | 0.0 | 0.0 | 218.0   | 0.0  | 25        |
| 26        | 179.0   | 170.0     | 180.0   | 200.0   | 130.0   | 0.0     | 3.0   | 0.0     | 0.0 | 0.0 | 206.0   | 0.0  | 26        |
| 27        | 185.0   | 170.0     | 185.0   | 196.0   | 137.0   | 0.0     | 3.8   | 0.0     | 0.0 | 0.0 | 196.0   | 0.0  | 27        |
| 28        | 185.0   | 175.0     | 190.0   | 190.0   | 127.0   | 0.0     | 12.0  | 0.0     | 0.0 | 0.0 | 144.0   | 0.0  | 28        |
| 29        | 186.0   | 171.0     | 190.0   | 190.0   | 125.0   | 0.0     | 15.0  | 0.0     | 0.0 | 0.0 | 59.0    | 0.0  | 29        |
| 30        | 191.0   | 170.0     | 190.0   | ---     | 100.0   | 0.0     | 23.0  | 0.0     | 0.0 | 0.0 | 40.0    | 0.0  | 30        |
| 31        | ---     | 170.0     | 190.0   | ---     | 59.0    | ---     | 41.0  | ---     | 0.0 | 0.0 | ---     | 0.0  | 31        |
| TOTAL CFS | 3,381.0 | 5,842.0   | 4,535.0 | 5,556.0 | 3,426.0 | 1,439.9 | 128.3 | 3,064.5 | 0.0 | 0.0 | 2,958.0 | 86.5 | TOTAL CFS |
| TOTAL AF  | 6,710   | 10,980    | 9,000   | 11,020  | 6,800   | 2,860   | 255   | 6,080   | 0   | 0   | 5,970   | 172  | TOTAL AF  |
| THE YEAR  | 59,857  | ACRE FEET |         |         |         |         |       |         |     |     |         |      |           |

NOTE: Data from this page was historically included in the ARCA Annual Report until the complete record page was converted to a high-flow, partial-record gaging station on June 30, 1970. On October 1, 1988 the gage was restored to a complete record gaging station. This report resumes the practice of reporting the Garden City flow. Flows for Compact Years 1987 and 1988 are included for completeness.

**B-8c** **DISCHARGE: ARKANSAS RIVER AT GARDEN CITY, KANSAS** **B-8c**  
**1989** **1989**  
**[IN 80 REPORT]** **[80 REPORT]**

U.S.G.S. PUBLISHED RECORDS: GAGING STATION # 7130000; [1]  
 DAILY MEAN DISCHARGE CUBIC FEET PER SECOND  
 REPORT YEAR ENDING OCTOBER 31, 1989

| COMPACT YEAR 1989 |         |           |         |         |       |     |         |         |         |     |       |     |           |
|-------------------|---------|-----------|---------|---------|-------|-----|---------|---------|---------|-----|-------|-----|-----------|
| DAY               | NOV     | DEC       | JAN     | FEB     | MAR   | APR | MAY     | JUN     | JUL     | AUG | SEP   | OCT | DAY       |
| 1                 | 0.0     | 115.0     | 70.0    | 75.0    | 26.0  | 0.0 | 0.0     | 33.0    | 21.0    | 0.0 | 0.0   | 0.0 | 1         |
| 2                 | 0.0     | 116.0     | 60.0    | 60.0    | 22.0  | 0.0 | 0.0     | 22.0    | 24.0    | 0.0 | 0.0   | 0.0 | 2         |
| 3                 | 0.0     | 112.0     | 70.0    | 35.0    | 18.0  | 0.0 | 0.0     | 16.0    | 14.0    | 0.0 | 0.0   | 0.0 | 3         |
| 4                 | 0.0     | 106.0     | 80.0    | 14.0    | 5.2   | 0.0 | 0.0     | 40.0    | 12.0    | 0.0 | 0.0   | 0.0 | 4         |
| 5                 | 0.0     | 110.0     | 100.0   | 1.4     | 4.7   | 0.0 | 0.0     | 95.0    | 9.3     | 0.0 | 0.0   | 0.0 | 5         |
| 6                 | 0.0     | 94.0      | 130.0   | 0.0     | 4.5   | 0.0 | 0.0     | 130.0   | 5.7     | 0.0 | 0.0   | 0.0 | 6         |
| 7                 | 0.0     | 106.0     | 166.0   | 0.0     | 5.0   | 0.0 | 0.0     | 217.0   | 1.6     | 0.0 | 0.0   | 0.0 | 7         |
| 8                 | 0.0     | 126.0     | 110.0   | 35.0    | 20.0  | 0.0 | 0.0     | 233.0   | 0.0     | 0.0 | 0.0   | 0.0 | 8         |
| 9                 | 0.0     | 121.0     | 70.0    | 50.0    | 70.0  | 0.0 | 0.0     | 239.0   | 0.0     | 0.0 | 0.0   | 0.0 | 9         |
| 10                | 0.9     | 116.0     | 70.0    | 70.0    | 99.0  | 0.0 | 0.0     | 226.0   | 0.0     | 0.0 | 0.0   | 0.0 | 10        |
| 11                | 2.8     | 109.0     | 80.0    | 90.0    | 30.0  | 0.0 | 0.0     | 210.0   | 0.0     | 0.0 | 0.0   | 0.0 | 11        |
| 12                | 5.7     | 101.0     | 90.0    | 110.0   | 19.0  | 0.0 | 0.0     | 178.0   | 0.1     | 0.0 | 5.5   | 0.0 | 12        |
| 13                | 10.0    | 120.0     | 70.0    | 130.0   | 10.0  | 0.0 | 0.0     | 154.0   | 0.0     | 0.0 | 0.0   | 0.0 | 13        |
| 14                | 32.0    | 118.0     | 90.0    | 110.0   | 2.4   | 0.0 | 0.0     | 143.0   | 0.0     | 0.0 | 6.9   | 0.0 | 14        |
| 15                | 49.0    | 103.0     | 70.0    | 110.0   | 0.4   | 0.0 | 0.0     | 131.0   | 128.0   | 0.0 | 33.0  | 0.0 | 15        |
| 16                | 51.0    | 118.0     | 80.0    | 125.0   | 0.0   | 0.0 | 0.0     | 129.0   | 318.0   | 0.0 | 58.0  | 0.0 | 16        |
| 17                | 44.0    | 126.0     | 100.0   | 140.0   | 0.0   | 0.0 | 0.0     | 112.0   | 246.0   | 0.0 | 63.0  | 0.0 | 17        |
| 18                | 44.0    | 125.0     | 130.0   | 140.0   | 0.0   | 0.0 | 1.8     | 79.0    | 238.0   | 0.0 | 64.0  | 0.0 | 18        |
| 19                | 42.0    | 130.0     | 175.0   | 130.0   | 0.0   | 0.0 | 338.0   | 43.0    | 147.0   | 0.0 | 67.0  | 0.0 | 19        |
| 20                | 54.0    | 120.0     | 250.0   | 140.0   | 0.0   | 0.0 | 263.0   | 25.0    | 19.0    | 0.0 | 64.0  | 0.0 | 20        |
| 21                | 74.0    | 126.0     | 250.0   | 130.0   | 0.0   | 0.0 | 184.0   | 10.0    | 7.2     | 0.0 | 56.0  | 0.0 | 21        |
| 22                | 63.0    | 130.0     | 181.0   | 150.0   | 0.0   | 0.0 | 108.0   | 10.0    | 3.6     | 0.0 | 56.0  | 0.0 | 22        |
| 23                | 73.0    | 131.0     | 114.0   | 140.0   | 0.0   | 0.0 | 160.0   | 12.0    | 0.9     | 0.0 | 52.0  | 0.0 | 23        |
| 24                | 84.0    | 130.0     | 103.0   | 170.0   | 0.0   | 0.0 | 142.0   | 12.0    | 0.0     | 0.0 | 54.0  | 0.0 | 24        |
| 25                | 76.0    | 129.0     | 99.0    | 170.0   | 0.0   | 0.0 | 116.0   | 15.0    | 0.0     | 0.0 | 37.0  | 0.0 | 25        |
| 26                | 83.0    | 123.0     | 100.0   | 117.0   | 0.0   | 0.0 | 85.0    | 22.0    | 0.0     | 0.0 | 13.0  | 0.0 | 26        |
| 27                | 84.0    | 85.0      | 90.0    | 59.0    | 0.0   | 0.0 | 61.0    | 30.0    | 0.0     | 0.0 | 6.0   | 0.0 | 27        |
| 28                | 90.0    | 60.0      | 102.0   | 34.0    | 0.0   | 0.0 | 68.0    | 21.0    | 0.0     | 0.0 | 1.8   | 0.0 | 28        |
| 29                | 98.0    | 50.0      | 78.0    | —       | 0.0   | 0.0 | 61.0    | 18.0    | 0.0     | 0.0 | 28.0  | 0.0 | 29        |
| 30                | 116.0   | 50.0      | 75.0    | —       | 0.0   | 0.0 | 53.0    | 16.0    | 0.0     | 0.0 | 0.0   | 0.0 | 30        |
| 31                | —       | 60.0      | 88.0    | —       | 0.0   | —   | 41.0    | —       | 0.0     | 0.0 | —     | 0.0 | 31        |
| TOTAL CFS         | 1,176.4 | 3,366.0   | 3,311.0 | 2,535.4 | 336.2 | 0.0 | 1,681.8 | 2,621.0 | 1,195.4 | 0.0 | 665.0 | 0.0 | TOTAL CFS |
| TOTAL AF          | 2,330   | 6,880     | 6,570   | 5,030   | 667   | 0   | 3,340   | 5,200   | 2,370   | 0   | 1,320 | 0   | TOTAL AF  |
| THE YEAR          | 33,507  | ACRE FEET |         |         |       |     |         |         |         |     |       |     |           |

NOTE: Data from this page was historically included in the ARCA Annual Report until the complete record gage was converted to a high-flow, partial-record gaging station on June 30, 1970. On October 1, 1986 the gage was restored to a complete record gaging station. This report resumes the practice of reporting the Garden City flow. Flows for Compact Years 1987 and 1988 are included for completeness.

**B-9**  
[PREVIOUSLY B-5a]  
1989

**CONTENTS JOHN MARTIN RESERVOIR CONSERVATION STORAGE**  
[PREVIOUSLY B-5a]  
1989

OPERATIONS SECRETARY, ARCA MONTHLY ACCOUNTING SHEETS  
MIDNIGHT CONTENTS [2400 HOURS] TO NEAREST ACRE FOOT [1]  
REPORT YEAR ENDING OCTOBER 31, 1989

| DAY | NOV   | DEC    | JAN    | FEB    | MAR    | APR    | MAY   | JUN | JUL | AUG | SEP | OCT | DAY |
|-----|-------|--------|--------|--------|--------|--------|-------|-----|-----|-----|-----|-----|-----|
| 1   | 353   | 6,047  | 10,926 | 16,107 | 20,793 | 24,470 | 0     | 0   | 0   | 0   | 0   | 0   | 1   |
| 2   | 542   | 6,209  | 11,124 | 16,163 | 21,029 | 22,138 | 0     | 0   | 0   | 0   | 0   | 0   | 2   |
| 3   | 806   | 6,423  | 11,274 | 16,222 | 21,237 | 19,915 | 0     | 0   | 0   | 0   | 0   | 0   | 3   |
| 4   | 1,035 | 6,591  | 11,518 | 16,285 | 21,397 | 18,082 | 0     | 596 | 0   | 0   | 0   | 0   | 4   |
| 5   | 1,132 | 6,755  | 11,724 | 16,349 | 21,580 | 16,207 | 0     | 782 | 0   | 0   | 0   | 0   | 5   |
| 6   | 1,316 | 6,916  | 11,936 | 16,419 | 21,791 | 14,311 | 0     | 0   | 0   | 0   | 0   | 0   | 6   |
| 7   | 1,437 | 7,077  | 12,047 | 16,488 | 22,060 | 12,415 | 0     | 0   | 0   | 0   | 0   | 0   | 7   |
| 8   | 1,552 | 7,285  | 12,123 | 16,558 | 22,320 | 10,524 | 0     | 0   | 0   | 0   | 0   | 0   | 8   |
| 9   | 1,716 | 7,444  | 12,270 | 16,660 | 22,562 | 8,645  | 0     | 0   | 0   | 0   | 0   | 0   | 9   |
| 10  | 1,845 | 7,602  | 12,365 | 16,770 | 22,825 | 6,749  | 0     | 0   | 0   | 0   | 0   | 0   | 10  |
| 11  | 2,200 | 7,763  | 12,530 | 16,881 | 23,054 | 4,890  | 0     | 0   | 0   | 0   | 0   | 0   | 11  |
| 12  | 2,329 | 7,921  | 12,692 | 17,013 | 23,283 | 3,046  | 0     | 0   | 0   | 0   | 0   | 0   | 12  |
| 13  | 2,458 | 8,085  | 12,804 | 17,169 | 23,510 | 1,161  | 0     | 0   | 0   | 0   | 0   | 0   | 13  |
| 14  | 2,594 | 8,357  | 12,886 | 17,326 | 23,719 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 14  |
| 15  | 2,753 | 8,636  | 12,969 | 17,436 | 23,873 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 15  |
| 16  | 2,894 | 8,718  | 13,104 | 17,541 | 24,024 | 0      | 1,273 | 0   | 0   | 0   | 0   | 0   | 16  |
| 17  | 3,116 | 8,946  | 13,295 | 17,962 | 24,142 | 0      | 1,504 | 0   | 0   | 0   | 0   | 0   | 17  |
| 18  | 3,551 | 9,071  | 13,536 | 18,164 | 24,325 | 0      | 1,401 | 0   | 0   | 0   | 0   | 0   | 18  |
| 19  | 3,734 | 9,463  | 13,728 | 18,499 | 24,508 | 0      | 2,158 | 0   | 0   | 0   | 0   | 0   | 19  |
| 20  | 4,001 | 9,704  | 14,032 | 18,758 | 24,687 | 0      | 1,571 | 0   | 0   | 0   | 0   | 0   | 20  |
| 21  | 4,061 | 9,876  | 14,284 | 18,870 | 24,884 | 0      | 49    | 0   | 0   | 0   | 0   | 0   | 21  |
| 22  | 4,309 | 10,030 | 14,472 | 19,054 | 25,101 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 22  |
| 23  | 4,608 | 10,148 | 14,600 | 19,384 | 25,275 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 23  |
| 24  | 4,726 | 10,275 | 14,732 | 19,677 | 25,465 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 24  |
| 25  | 4,904 | 10,402 | 14,874 | 19,980 | 25,641 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 25  |
| 26  | 5,146 | 10,531 | 15,020 | 20,281 | 25,857 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 26  |
| 27  | 5,300 | 10,558 | 15,281 | 20,426 | 25,977 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 27  |
| 28  | 5,555 | 10,568 | 15,543 | 20,567 | 26,130 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 28  |
| 29  | 5,727 | 10,592 | 15,749 | --     | 26,340 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 29  |
| 30  | 5,866 | 10,611 | 15,903 | --     | 26,563 | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 30  |
| 31  | --    | 10,680 | 16,063 | --     | 26,794 | --     | 0     | --  | 0   | 0   | 0   | 0   | 31  |

NOTES: [1] Values are the volume of winter and/or summer compact water remaining in conservation storage prior to release to agreement accounts, as reported by the Operations Secretary.

B-10  
1989

## TRANSFER OF WATER FROM JMR CONSERVATION STORAGE

## INTO AGREEMENT ACCOUNTS

OPERATIONS SECRETARY, ARCA ; IN ACRE FEET (1), (2)  
REPORT YEAR ENDING OCTOBER 31, 1989B-10  
1989

| DAY      | NOV    | DEC       | JAN | FEB | MAR | APR      | MAY     | JUN     | JUL | AUG | SEP | OCT | DAY      |
|----------|--------|-----------|-----|-----|-----|----------|---------|---------|-----|-----|-----|-----|----------|
| 1        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 2,479.4  | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 1        |
| 2        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 2,479.4  | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 2        |
| 3        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 2,364.7  | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 3        |
| 4        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 4        |
| 5        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 5        |
| 6        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 1,028.2 | 0.0 | 0.0 | 0.0 | 0.0 | 6        |
| 7        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 194.0   | 0.0 | 0.0 | 0.0 | 0.0 | 7        |
| 8        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 181.0   | 0.0 | 0.0 | 0.0 | 0.0 | 8        |
| 9        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 155.0   | 0.0 | 0.0 | 0.0 | 0.0 | 9        |
| 10       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 158.0   | 0.0 | 0.0 | 0.0 | 0.0 | 10       |
| 11       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 205.0   | 0.0 | 0.0 | 0.0 | 0.0 | 11       |
| 12       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 149.7   | 0.0 | 0.0 | 0.0 | 0.0 | 12       |
| 13       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,983.5  | 0.0     | 384.3   | 0.0 | 0.0 | 0.0 | 0.0 | 13       |
| 14       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 1,232.0  | 0.0     | 186.4   | 0.0 | 0.0 | 0.0 | 0.0 | 14       |
| 15       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 0.0     | 98.8    | 0.0 | 0.0 | 0.0 | 0.0 | 15       |
| 16       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 1,239.7 | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 16       |
| 17       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 1,983.5 | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 17       |
| 18       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 991.8   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 18       |
| 19       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 19       |
| 20       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 991.8   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 20       |
| 21       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 1,983.5 | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 21       |
| 22       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 313.4   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 22       |
| 23       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 299.0   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 23       |
| 24       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 187.0   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 24       |
| 25       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 104.0   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 25       |
| 26       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 131.0   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 26       |
| 27       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 179.0   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 27       |
| 28       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 132.0   | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 28       |
| 29       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 50.3    | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 29       |
| 30       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 30       |
| 31       | ---    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0      | 0.0     | 0.0     | 0.0 | 0.0 | 0.0 | 0.0 | 31       |
| TOTAL AF | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 28,380.4 | 8,565.9 | 2,738.5 | 0.0 | 0.0 | 0.0 | 0.0 | TOTAL AF |
| THE YEAR | 39,715 | ACRE FEET |     |     |     |          |         |         |     |     |     |     |          |

NOTES: [1] All conservation storage water was released into Colorado and Kansas accounts as follows: 40% to Kansas and 60% to Colorado, as described in the 1980 Colorado-Kansas Operating Plan Resolution.

[2] Values reported are "winter compact water" and "summer compact water" releases from monthly accounting sheets, rounded to the nearest 0.1 AF.

**B-11** **DEMANDS BY COLORADO FOR AGREEMENT ACCOUNT WATER FROM JMR** **B-11**  
**1989** **1989**

OPERATIONS SECRETARY, ARCA : IN ACRE FEET [1]  
 REPORT YEAR ENDING OCTOBER 31, 1989

| DAY      | NOV    | DEC       | JAN | FEB | MAR     | APR      | MAY      | JUN     | JUL      | AUG     | SEP   | OCT   | DAY      |
|----------|--------|-----------|-----|-----|---------|----------|----------|---------|----------|---------|-------|-------|----------|
| 1        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 787.7    | 678.5    | 563.5   | 0.0      | 279.8   | 0.0   | 0.0   | 1        |
| 2        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 787.7    | 594.2    | 563.5   | 74.9     | 269.7   | 0.0   | 0.0   | 2        |
| 3        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 926.0    | 557.5    | 211.3   | 282.7    | 269.7   | 0.0   | 0.0   | 3        |
| 4        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,051.7  | 546.2    | 0.0     | 380.4    | 269.7   | 0.0   | 0.0   | 4        |
| 5        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,079.2  | 650.2    | 0.0     | 380.4    | 253.5   | 83.9  | 0.0   | 5        |
| 6        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,080.3  | 731.6    | 0.0     | 415.5    | 248.9   | 134.2 | 50.8  | 6        |
| 7        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,174.1  | 710.5    | 0.0     | 468.5    | 230.7   | 134.2 | 81.3  | 7        |
| 8        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,230.4  | 812.6    | 0.0     | 507.0    | 219.2   | 119.2 | 81.3  | 8        |
| 9        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,230.4  | 869.4    | 0.0     | 507.0    | 219.2   | 110.2 | 81.3  | 9        |
| 10       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,216.0  | 820.7    | 0.0     | 490.9    | 219.2   | 110.2 | 81.3  | 10       |
| 11       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,188.2  | 725.2    | 0.0     | 456.7    | 119.5   | 90.5  | 81.3  | 11       |
| 12       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,116.9  | 709.9    | 68.7    | 316.6    | 59.7    | 29.5  | 30.5  | 12       |
| 13       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,069.3  | 619.3    | 159.3   | 261.9    | 59.7    | 0.0   | 0.0   | 13       |
| 14       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,098.7  | 619.9    | 168.4   | 261.9    | 59.7    | 0.0   | 0.0   | 14       |
| 15       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 1,28.9   | 909.3    | 415.7   | 158.8    | 51.0    | 0.0   | 0.0   | 15       |
| 16       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 215.6    | 853.9    | 298.7   | 174.8    | 93.1    | 0.0   | 0.0   | 16       |
| 17       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 225.8    | 908.7    | 341.3   | 0.0      | 485.3   | 0.0   | 0.0   | 17       |
| 18       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 225.8    | 879.3    | 151.1   | 0.0      | 611.5   | 0.0   | 0.0   | 18       |
| 19       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 225.8    | 856.3    | 0.0     | 157.5    | 597.4   | 0.0   | 0.0   | 19       |
| 20       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 210.4    | 856.3    | 0.0     | 281.9    | 557.4   | 0.0   | 0.0   | 20       |
| 21       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 200.3    | 839.7    | 0.0     | 666.3    | 546.4   | 0.0   | 0.0   | 21       |
| 22       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 192.8    | 810.4    | 0.0     | 857.4    | 549.3   | 0.0   | 0.0   | 22       |
| 23       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 188.3    | 796.6    | 0.0     | 783.2    | 549.3   | 0.0   | 0.0   | 23       |
| 24       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 201.2    | 807.8    | 0.0     | 458.7    | 385.1   | 302.6 | 0.0   | 24       |
| 25       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 208.9    | 814.8    | 0.0     | 275.1    | 363.9   | 302.6 | 0.0   | 25       |
| 26       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 208.9    | 739.7    | 0.0     | 178.0    | 401.9   | 126.1 | 0.0   | 26       |
| 27       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 215.4    | 694.5    | 0.0     | 66.8     | 356.9   | 0.0   | 0.0   | 27       |
| 28       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 251.8    | 694.5    | 0.0     | 184.3    | 338.9   | 0.0   | 0.0   | 28       |
| 29       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 271.3    | 694.5    | 97.1    | 110.6    | 338.9   | 0.0   | 0.0   | 29       |
| 30       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0     | 271.3    | 694.5    | 515.1   | 0.0      | 317.9   | 0.0   | 0.0   | 30       |
| 31       | --     | 0.0       | 0.0 | 0.0 | 0.0     | 508.0    | --       | 626.3   | --       | 305.3   | 0.0   | 0.0   | 31       |
| TOTAL AF | 0.0    | 0.0       | 0.0 | 0.0 | 3,950.5 | 27,927.3 | 12,092.5 | 6,088.1 | 11,732.1 | 3,561.5 | 812.0 | 488.0 | TOTAL AF |
| THE YEAR | 66,552 | ACRE FEET |     |     |         |          |          |         |          |         |       |       |          |

NOTE: [1] Rounded to nearest 0.1 af

**B-12** **DEMANDS BY KANSAS FOR AGREEMENT ACCOUNT WATER FROM JMR** **B-12**  
1989 **1989**  
OPERATIONS SECRETARY, ARCA : IN ACRE FEET [1][2]  
REPORT YEAR ENDING OCTOBER 31, 1989

| DAY      | NOV    | DEC       | JAN | FEB | MAR | APR | MAY     | JUN | JUL      | AUG     | SEP | OCT     | DAY      |
|----------|--------|-----------|-----|-----|-----|-----|---------|-----|----------|---------|-----|---------|----------|
| 1        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 793.4   | 0.0 | 0.0     | 1        |
| 2        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 793.4   | 0.0 | 309.9   | 2        |
| 3        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 793.4   | 0.0 | 495.9   | 3        |
| 4        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 793.4   | 0.0 | 495.9   | 4        |
| 5        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 793.4   | 0.0 | 495.9   | 5        |
| 6        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 793.4   | 0.0 | 495.9   | 6        |
| 7        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 396.7    | 793.4   | 0.0 | 495.9   | 7        |
| 8        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 446.3   | 0.0 | 793.4    | 793.4   | 0.0 | 495.9   | 8        |
| 9        | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 793.4   | 0.0 | 793.4    | 793.4   | 0.0 | 495.9   | 9        |
| 10       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 793.4   | 0.0 | 793.4    | 793.4   | 0.0 | 495.9   | 10       |
| 11       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 793.4   | 0.0 | 793.4    | 793.4   | 0.0 | 495.9   | 11       |
| 12       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 793.4   | 0.0 | 793.4    | 793.4   | 0.0 | 196.0   | 12       |
| 13       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 793.4   | 0.0 | 793.4    | 297.5   | 0.0 | 0.0     | 13       |
| 14       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 793.4   | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 14       |
| 15       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 495.9   | 0.0 | 314.1    | 0.0     | 0.0 | 0.0     | 15       |
| 16       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 16       |
| 17       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 17       |
| 18       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 18       |
| 19       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 19       |
| 20       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 20       |
| 21       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 21       |
| 22       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 22       |
| 23       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 23       |
| 24       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 0.0      | 0.0     | 0.0 | 0.0     | 24       |
| 25       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 495.9    | 0.0     | 0.0 | 0.0     | 25       |
| 26       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 26       |
| 27       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 27       |
| 28       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 28       |
| 29       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 29       |
| 30       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 30       |
| 31       | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 0.0     | 0.0 | 793.4    | 0.0     | 0.0 | 0.0     | 31       |
| TOTAL AF | 0.0    | 0.0       | 0.0 | 0.0 | 0.0 | 0.0 | 5,702.6 | 0.0 | 11,520.8 | 9,818.3 | 0.0 | 4,958.8 | TOTAL AF |
| THE YEAR | 32,001 | ACRE FEET |     |     |     |     |         |     |          |         |     |         |          |

NOTE: (1) Rounded to nearest 0.1 af  
(2) Does not include transit loss account releases

B-13  
1989

# STATELINE FLOWS ON DAYS OF KANSAS DEMANDS

B-13  
1989

ARKANSAS RIVER AT THE STATELINE [1][2]  
OPERATIONS SECRETARY, ARCA, IN ACRE FEET  
REPORT YEAR ENDING OCTOBER 31, 1989

| DAY      | NOV    | DEC       | JAN | FEB | MAR | APR | MAY    | JUN | JUL    | AUG    | SEP | OCT   | DAY      |
|----------|--------|-----------|-----|-----|-----|-----|--------|-----|--------|--------|-----|-------|----------|
| 1        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 960    | 0   | 0     | 1        |
| 2        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 1,246  | 0   | 0     | 2        |
| 3        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 1,087  | 0   | 0     | 3        |
| 4        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 1,000  | 0   | 0     | 4        |
| 5        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 950    | 0   | 341   | 5        |
| 6        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 938    | 0   | 413   | 6        |
| 7        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 996    | 0   | 486   | 7        |
| 8        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 996    | 0   | 490   | 8        |
| 9        | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 442    | 990    | 0   | 516   | 9        |
| 10       | 0      | 0         | 0   | 0   | 0   | 0   | 532    | 0   | 700    | 948    | 0   | 514   | 10       |
| 11       | 0      | 0         | 0   | 0   | 0   | 0   | 833    | 0   | 819    | 930    | 0   | 504   | 11       |
| 12       | 0      | 0         | 0   | 0   | 0   | 0   | 948    | 0   | 998    | 1,208  | 0   | 508   | 12       |
| 13       | 0      | 0         | 0   | 0   | 0   | 0   | 994    | 0   | 1,083  | 2,013  | 0   | 504   | 13       |
| 14       | 0      | 0         | 0   | 0   | 0   | 0   | 1,404  | 0   | 1,115  | 1,172  | 0   | 401   | 14       |
| 15       | 0      | 0         | 0   | 0   | 0   | 0   | 1,511  | 0   | 1,073  | 815    | 0   | 341   | 15       |
| 16       | 0      | 0         | 0   | 0   | 0   | 0   | 1,652  | 0   | 1,170  | 654    | 0   | 305   | 16       |
| 17       | 0      | 0         | 0   | 0   | 0   | 0   | 1,349  | 0   | 766    | 742    | 0   | 286   | 17       |
| 18       | 0      | 0         | 0   | 0   | 0   | 0   | 1,416  | 0   | 811    | 532    | 0   | 270   | 18       |
| 19       | 0      | 0         | 0   | 0   | 0   | 0   | 960    | 0   | 546    | 458    | 0   | 262   | 19       |
| 20       | 0      | 0         | 0   | 0   | 0   | 0   | 736    | 0   | 438    | 434    | 0   | 0     | 20       |
| 21       | 0      | 0         | 0   | 0   | 0   | 0   | 641    | 0   | 389    | 0      | 0   | 0     | 21       |
| 22       | 0      | 0         | 0   | 0   | 0   | 0   | 575    | 0   | 343    | 0      | 0   | 0     | 22       |
| 23       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 0      | 0   | 0     | 23       |
| 24       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 0      | 0   | 0     | 24       |
| 25       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 0      | 0   | 0     | 25       |
| 26       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 0      | 0      | 0   | 0     | 26       |
| 27       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 532    | 0      | 0   | 0     | 27       |
| 28       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 724    | 0      | 0   | 0     | 28       |
| 29       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 819    | 0      | 0   | 0     | 29       |
| 30       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 879    | 0      | 0   | 0     | 30       |
| 31       | 0      | 0         | 0   | 0   | 0   | 0   | 0      | 0   | 916    | 0      | 0   | 0     | 31       |
| TOTAL AF | 0      | 0         | 0   | 0   | 0   | 0   | 13,551 | 0   | 14,363 | 19,068 | 0   | 6,139 | TOTAL AF |
| THE YEAR | 53,122 | ACRE FEET |     |     |     |     |        |     |        |        |     |       |          |

NOTES [1] Flow revised from that presented in Oper. Sec. 89 Report to reflect USGS published data.

[2] State line flow is sum of Arkansas River at Coolidge, Kansas and Frontier Ditch near Coolidge, on days of Kansas demand, including applicable rundown period.

B-14a  
1989

**DIVERSIONS BY DITCHES, COLORADO WATER DISTRICT 14**  
COLORADO DIV. WATER RESOURCES, WATER COMMISSIONER REPORTS, ACRE FEET [1]  
REPORT-YEAR ENDING OCTOBER 31, 1989

B-14a  
1989

| NAME OF CANAL         | NOV      | DEC     | JAN     | FEB      | MAR      | APR      | MAY      | JUN      | JUL      | AUG      | SEP      | OCT      | YEAR      |
|-----------------------|----------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| BESSEMER (RIVER)      | 2,068.2  | 0.0     | 0.0     | 0.0      | 1,863.4  | 4,212.4  | 5,757.3  | 11,683.8 | 5,921.0  | 4,507.1  | 4,333.4  | 4,425.5  | 44,591.9  |
| RES. OR IMPORTED      | 0.0      | 0.0     | 0.0     | 0.0      | 0.0      | 2,822.9  | 2,966.0  | 1,305.1  | 5,770.4  | 6,433.2  | 187.5    | 0.0      | 19,485.1  |
| TOTAL BESSEMER        | 2,068.2  | 0.0     | 0.0     | 0.0      | 1,863.4  | 7,035.2  | 8,723.3  | 12,988.9 | 11,691.4 | 10,940.3 | 4,520.9  | 4,425.5  | 64,077.1  |
| MINNEQUA-FT. UNION    | 6,918.5  | 7,438.1 | 3,477.1 | 2,365.9  | 6,671.2  | 4,076.5  | 6,036.2  | 7,223.4  | 7,460.7  | 7,226.3  | 7,218.4  | 7,457.3  | 73,569.5  |
| WEST PUEBLO           | 0.0      | 0.0     | 0.0     | 0.0      | 64.4     | 112.5    | 88.5     | 145.2    | 162.7    | 143.6    | 0.0      | 0.0      | 716.9     |
| EXCELSIOR             | 0.0      | 0.0     | 0.0     | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0       |
| COLLIER               | 0.0      | 0.0     | 0.0     | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0       |
| COLORADO (RIVER)      | 0.0      | 0.0     | 0.0     | 9,514.2  | 10,969.9 | 0.0      | 1,112.1  | 403.6    | 1,592.1  | 0.0      | 0.0      | 0.0      | 23,511.8  |
| RES. OR IMPORTED      | 0.0      | 0.0     | 0.0     | 0.0      | 0.0      | 54.7     | 6,028.8  | 0.0      | 0.0      | 11,023.3 | 5,427.0  | 0.0      | 22,533.9  |
| TOTAL COLORADO        | 0.0      | 0.0     | 0.0     | 9,514.2  | 11,044.6 | 6,028.8  | 1,112.1  | 403.6    | 12,615.4 | 5,427.0  | 0.0      | 0.0      | 46,145.7  |
| HIGHLINE (RIVER)      | 2,517.6  | 0.0     | 0.0     | 0.0      | 3,336.2  | 7,545.6  | 8,019.4  | 12,366.3 | 8,198.7  | 6,969.7  | 5,306.5  | 5,657.5  | 59,918.4  |
| RES. OR IMPORTED      | 101.1    | 0.0     | 0.0     | 0.0      | 2,162.7  | 6,913.2  | 905.0    | 0.0      | 3,508.3  | 4,099.9  | 590.6    | 0.0      | 18,278.6  |
| TOTAL HIGHLINE        | 2,618.7  | 0.0     | 0.0     | 0.0      | 5,498.8  | 14,458.8 | 8,924.4  | 12,366.3 | 11,705.9 | 11,069.6 | 5,897.0  | 5,657.5  | 76,197.0  |
| OXFORD FARMER (RIVER) | 1,334.7  | 0.0     | 0.0     | 0.0      | 3,459.2  | 1,429.1  | 3,893.5  | 5,655.8  | 2,178.3  | 3,042.9  | 863.0    | 943.0    | 22,799.5  |
| RES. OR IMPORTED      | 0.0      | 0.0     | 0.0     | 0.0      | 97.0     | 1,483.1  | 591.8    | 69.4     | 1,692.9  | 760.1    | 297.5    | 307.4    | 5,289.2   |
| TOTAL OXFORD FARMER   | 1,334.7  | 0.0     | 0.0     | 0.0      | 3,556.2  | 2,912.1  | 4,475.3  | 5,725.2  | 3,871.2  | 3,803.0  | 1,160.6  | 1,250.5  | 28,088.8  |
| RIVER, DISTRICT #14   | 12,839.0 | 7,438.1 | 3,477.1 | 11,880.1 | 26,204.2 | 17,376.0 | 24,907.0 | 37,478.0 | 25,514.4 | 21,889.5 | 17,721.2 | 18,483.3 | 225,208.0 |
| RES./IMP. DIST. #14   | 101.1    | 0.0     | 0.0     | 0.0      | 2,314.4  | 17,247.9 | 4,452.8  | 1,374.6  | 21,992.9 | 16,720.2 | 1,075.6  | 307.4    | 65,586.8  |
| TOTAL DISTRICT #14    | 12,940.1 | 7,438.1 | 3,477.1 | 11,880.1 | 28,518.6 | 34,624.0 | 29,359.8 | 38,852.6 | 47,507.3 | 38,609.8 | 18,796.8 | 18,790.8 | 290,794.9 |

NOTES: [1] Monthly report data rounded to nearest 0.1 AF.

[2] "River" refers to direct flow diversions of native Arkansas River flows.

"Res." refers to diversion of stored water released to river from reservoirs for redistribution.

"Imported" refers to diversions of non-native (trans-mountain) water brought into the Arkansas Basin for use by the canal.

B-14b  
1989

DIVERSIONS BY DITCHES, COLORADO WATER DISTRICT 17

COLORADO DIV. WATER RESOURCES, WATER COMMISSIONER REPORTS, ACRE FEET (1)

REPORT-YEAR ENDING OCTOBER 31, 1989

B-14b  
1989

| NAME OF CANAL            | NOV      | DEC      | JAN      | FEB      | MAR      | APR      | MAY      | JUN       | JUL       | AUG       | SEP      | OCT      | YEAR      |
|--------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|----------|----------|-----------|
| OTERO (RIVER)            | 850.7    | 772.8    | 0.0      | 388.1    | 1,275.5  | 0.0      | 372.8    | 800.4     | 408.7     | 1.7       | 0.0      | 0.0      | 4,871.6   |
| RES. OR IMPORTED         | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 165.3    | 124.0     | 1,054.1   | 551.1     | 0.0      | 0.0      | 1,994.5   |
| TOTAL OTERO              | 850.7    | 772.8    | 0.0      | 388.1    | 1,275.5  | 0.0      | 538.1    | 924.4     | 1,462.8   | 552.8     | 0.0      | 0.0      | 6,866.1   |
| CATLIN CANAL (RIVER)     | 4,645.5  | 0.0      | 0.0      | 0.0      | 8,515.2  | 12,566.6 | 12,123.1 | 15,331.0  | 13,913.7  | 12,497.8  | 4,796.1  | 5,417.4  | 89,806.3  |
| RES. OR IMPORTED         | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 3,111.0  | 0.0      | 0.0       | 2,945.5   | 3,876.0   | 3,237.4  | 1,164.8  | 14,334.7  |
| TOTAL CATLIN             | 4,645.5  | 0.0      | 0.0      | 0.0      | 8,515.2  | 15,677.6 | 12,123.1 | 15,331.0  | 16,859.2  | 16,373.8  | 8,033.5  | 6,582.2  | 104,141.0 |
| HOLBROOK (RIVER)         | 0.0      | 2,863.5  | 3,233.4  | 0.0      | 2,129.9  | 392.6    | 1,380.7  | 5,428.9   | 6,498.1   | 4,731.9   | 0.0      | 0.0      | 26,491.1  |
| RES. OR IMPORTED         | 590.1    | 1,128.6  | 72.0     | 0.0      | 5,932.0  | 4,971.1  | 2,022.4  | 0.0       | 7,854.8   | 5,761.1   | 0.0      | 0.0      | 28,332.2  |
| TOTAL HOLBROOK           | 590.1    | 3,812.1  | 3,305.4  | 0.0      | 8,061.9  | 5,363.7  | 3,403.1  | 5,428.9   | 14,353.9  | 10,493.1  | 0.0      | 0.0      | 54,813.3  |
| ROCKY FORD               | 1,036.5  | 0.0      | 0.0      | 0.0      | 2,952.6  | 6,428.4  | 5,218.1  | 5,289.0   | 6,636.8   | 6,604.9   | 2,830.7  | 2,258.0  | 39,254.9  |
| FT. LYON STORAGE (RIVER) | 7,097.0  | 13,493.8 | 12,906.8 | 16,792.3 | 3,731.9  | 0.0      | 1,204.6  | 0.0       | 76.2      | 453.4     | 0.0      | 0.0      | 55,757.9  |
| RES. OR IMPORTED         | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0       | 5,439.2   | 453.4     | 0.0      | 0.0      | 5,892.6   |
| TOTAL FT. LYON STORAGE   | 7,097.0  | 13,493.8 | 12,906.8 | 16,792.3 | 3,731.9  | 0.0      | 1,204.6  | 0.0       | 5,517.4   | 906.8     | 0.0      | 0.0      | 61,650.5  |
| FT. LYON (RIVER)         | 12,340.0 | 0.0      | 0.0      | 0.0      | 13,556.4 | 10,387.4 | 23,613.7 | 37,938.7  | 12,466.8  | 12,227.6  | 9,395.5  | 10,387.3 | 142,313.3 |
| RES. OR IMPORTED         | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 542.3     | 23,417.0  | 12,928.5  | 0.0      | 0.0      | 36,887.8  |
| TOTAL FT. LYON           | 12,340.0 | 0.0      | 0.0      | 0.0      | 13,556.4 | 10,387.4 | 23,613.7 | 38,481.0  | 35,883.8  | 25,156.1  | 9,395.5  | 10,387.3 | 179,201.1 |
| LAS ANIMAS CONSOL.       | 1,396.8  | 0.0      | 0.0      | 0.0      | 1,616.6  | 3,161.9  | 3,281.1  | 4,257.9   | 4,698.8   | 3,438.3   | 2,635.9  | 2,773.7  | 27,261.0  |
| NATIVE-DISTRICT #17      | 20,269.6 | 3,456.3  | 3,233.4  | 388.1    | 30,046.2 | 32,936.8 | 45,989.5 | 69,046.8  | 44,624.9  | 39,502.2  | 19,658.1 | 20,836.4 | 329,958.2 |
| RES. OR IMPORTED #17     | 590.1    | 1,128.6  | 72.0     | 0.0      | 5,932.0  | 8,082.1  | 2,187.7  | 666.3     | 35,271.4  | 23,116.8  | 3,237.4  | 1,164.8  | 81,449.2  |
| TOTAL DISTRICT #17       | 20,859.7 | 4,584.9  | 3,305.4  | 388.1    | 35,978.1 | 41,018.9 | 48,177.2 | 69,713.1  | 79,896.3  | 62,619.0  | 22,895.5 | 22,001.1 | 411,407.4 |
| NATIVE DIST. #14 + #17   | 33,108.6 | 10,894.4 | 6,710.5  | 12,268.2 | 56,250.4 | 50,312.8 | 70,896.5 | 106,524.9 | 70,139.2  | 61,391.7  | 37,379.3 | 39,319.7 | 555,196.2 |
| RES/IMP DIST. #14 + #17  | 691.2    | 1,128.6  | 72.0     | 0.0      | 8,246.4  | 25,330.0 | 6,640.5  | 2,040.8   | 57,284.3  | 39,837.0  | 4,313.0  | 1,472.2  | 147,036.0 |
| TOTAL DIST. #14 + #17    | 33,799.8 | 12,023.0 | 6,782.5  | 12,268.2 | 64,496.7 | 75,942.9 | 77,537.0 | 108,565.7 | 127,403.5 | 101,228.7 | 41,692.3 | 40,791.9 | 702,232.3 |

NOTES: [1] Monthly report data rounded to nearest 0.1 AF

[2] "River" refers to direct flow diversions of native Arkansas River flows.

"Res." refers to diversion of stored water released to river from reservoirs for redelivery.

"Imported" refers to diversions of non-native (trans-mountain) water brought into the Arkansas Basin for use by the canal.

**B-14c**  
[PREVIOUSLY B-15]  
1989

**DIVERSIONS BY DITCHES, COLORADO WATER DISTRICT 67**  
COLORADO DIV. WATER RESOURCES, WATER COMMISSIONER REPORTS, ACRE FEET [1]  
REPORT-YEAR ENDING OCTOBER 31, 1989

**B-14c**  
[PREV. B-15]  
1989

| NAME OF CANAL      | NOV     | DEC | JAN | FEB | MAR     | APR      | MAY      | JUN      | JUL      | AUG      | SEP      | OCT     | YEAR      |
|--------------------|---------|-----|-----|-----|---------|----------|----------|----------|----------|----------|----------|---------|-----------|
| FORT BENT          | 228.1   | 0.0 | 0.0 | 0.0 | 0.0     | 2,661.9  | 1,505.5  | 1,745.5  | 3,929.3  | 3,407.7  | 1,864.2  | 1,727.6 | 16,867.7  |
| KESSEE DITCH       | 148.8   | 0.0 | 0.0 | 0.0 | 0.0     | 797.4    | 628.8    | 595.1    | 1,071.1  | 843.0    | 299.5    | 741.8   | 5,125.4   |
| AMITY              | 67.4    | 0.0 | 0.0 | 0.0 | 17.9    | 20,804.9 | 9,514.9  | 5,280.1  | 12,585.3 | 13,761.5 | 505.8    | 0.0     | 62,537.8  |
| LAMAR              | 1,194.1 | 0.0 | 0.0 | 0.0 | 2,271.1 | 4,708.8  | 3,865.8  | 4,254.6  | 6,880.7  | 5,982.2  | 4,917.1  | 4,022.5 | 38,107.0  |
| HYDE               | 79.3    | 0.0 | 0.0 | 0.0 | 166.6   | 380.8    | 382.8    | 299.5    | 353.1    | 561.3    | 388.8    | 251.9   | 2,864.2   |
| MANUEL             | 0.0     | 0.0 | 0.0 | 0.0 | 1,140.5 | 1,227.8  | 0.0      | 0.0      | 285.6    | 0.0      | 0.0      | 0.0     | 2,653.9   |
| X.Y. & GRAHAM      | 727.9   | 0.0 | 0.0 | 0.0 | 63.5    | 1,876.4  | 1,414.2  | 1,408.3  | 2,179.9  | 1,557.1  | 1,608.6  | 1,253.6 | 12,089.4  |
| BUFFALO            | 1,176.2 | 0.0 | 0.0 | 0.0 | 386.8   | 3,570.3  | 1,164.3  | 1,971.6  | 4,683.0  | 3,187.5  | 2,580.5  | 1,477.7 | 20,207.8  |
| TOTAL NATIVE       | 3,619.9 | 0.0 | 0.0 | 0.0 | 4,046.3 | 36,028.3 | 18,476.3 | 15,554.6 | 31,978.0 | 28,300.3 | 11,974.4 | 9,475.2 | 160,453.3 |
| TRANSMTN. DEL. [2] |         |     |     |     |         |          |          |          | 880.7    | 858.9    |          |         | 1,739.5   |
| TOTAL DIST 67      | 3,619.9 | 0.0 | 0.0 | 0.0 | 4,046.3 | 36,028.3 | 18,476.3 | 15,554.6 | 32,858.7 | 30,159.1 | 11,974.4 | 9,475.2 | 162,192.8 |

NOTES: [1] Monthly report data rounded to nearest 0.1 AF.  
[2] City of Lamar's receipt of Fry-Ark water via Ft. Bent Canal.

**B-15**  
[PREVIOUSLY B-16]  
1989

**DIVERSIONS BY DITCHES, KANSAS STATELINE TO GARDEN CITY**  
B-15  
[PREV. B-16]  
1989

COMPILED BY KANSAS DIV. OF WATER RESOURCES, ACRE FEET  
FRONTIER DITCH USGS RECORD, OTHER DITCHES DWR RECORDS  
REPORT-YEAR ENDING OCTOBER 31, 1989

| NAME OF CANAL                      | NOV   | DEC | JAN | FEB | MAR   | APR   | MAY   | JUN   | JUL    | AUG    | SEP   | OCT   | YEAR   |
|------------------------------------|-------|-----|-----|-----|-------|-------|-------|-------|--------|--------|-------|-------|--------|
| FRONTIER DITCH [1] [2]             | 698   | 0   | 0   | 0   | 0     | 2,354 | 563   | 1,142 | 2,225  | 1,051  | 998   | 1,168 | 10,199 |
| TOTAL STATELINE TO SYRACUSE [1]    | 698   | 0   | 0   | 0   | 0     | 2,354 | 563   | 1,142 | 2,225  | 1,051  | 998   | 1,168 | 10,199 |
| AMAZON CANAL                       | 0     | 0   | 0   | 0   | 442   | 1,535 | 0     | 734   | 6,970  | 4,395  | 1,892 | 4,110 | 20,078 |
| GREAT EASTERN CANAL                | 0     | 0   | 0   | 912 | 4,796 | 212   | 4,752 | 1,349 | 119    | 6,847  | 0     | 256   | 19,043 |
| SOUTH SIDE DITCH [3]               | 728   | 0   | 0   | 0   | 0     | 605   | 1,511 | 0     | 63     | 2,743  | 0     | 1,583 | 7,233  |
| FARMERS DITCH                      | 764   | 0   | 0   | 0   | 712   | 2,029 | 2,176 | 696   | 1,680  | 3,261  | 420   | 1,496 | 13,204 |
| GARDEN CITY CANAL                  | 143   | 0   | 0   | 0   | 0     | 337   | 240   | 60    | 232    | 363    | 93    | 268   | 1,796  |
| TOTAL SYRACUSE TO GARDEN CITY [3]  | 1,635 | 0   | 0   | 912 | 5,950 | 4,718 | 8,679 | 2,608 | 9,064  | 17,409 | 2,405 | 7,713 | 61,294 |
| TOTAL STATELINE TO GARDEN CITY [4] | 2,333 | 0   | 0   | 912 | 5,950 | 7,072 | 9,242 | 3,951 | 11,289 | 18,460 | 3,403 | 8,991 | 71,493 |

NOTES: [1] Frontier Ditch total diversion includes 3,038 AF returned directly to the River.  
 [2] During the period Nov. 1, 1988 through Oct. 31, 1989 the Frontier Ditch was authorized to divert water authorized to be diverted by the Fort Aubrey Ditch.  
 [3] South Side Ditch total diversion of 7,233 AF includes a total of 1,035 AF which was returned to the River for subsequent diversion by downstream ditches during the period Nov. 1, 1988 through Oct. 31, 1989.  
 [4] Total diversions Stateline to Garden City include 4,073 AF returned to the River, 3,038 AF by the Frontier Ditch and 1,035 AF by the South Side.

**B-16**  
[PREVIOUSLY B-17]  
1989

# **TRANSMOUNTAIN DIVERSIONS INTO THE ARKANSAS BASIN**

SOURCE: COLORADO DIVISION 2 ENGINEER, IN ACRE FEET [1]  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-16**  
[PREV. B-17]  
1989

| STRUCTURE/OWNER               | NOV     | DEC   | JAN   | FEB   | MAR   | APR     | MAY      | JUN      | JUL      | AUG     | SEP     | OCT     | YEAR      |
|-------------------------------|---------|-------|-------|-------|-------|---------|----------|----------|----------|---------|---------|---------|-----------|
| TWIN LAKES TUNNEL [2]         | 27.3    | 30.6  | 24.1  | 24.1  | 26.8  | 1,429.9 | 10,984.6 | 16,004.9 | 5,978.3  | 2,431.3 | 16.9    | 72.8    | 37,051.4  |
| HOMESTAKE TUNNEL [3]          | 4,770.3 | 0.0   | 0.0   | 0.0   | 0.0   | 1,674.1 | 3,788.5  | 1,459.9  | 2,644.0  | 3,695.3 | 3,528.7 | 1,237.7 | 22,798.4  |
| WURTZ DITCH (PUEBLO)          | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 57.4    | 951.9    | 788.6    | 187.6    | 60.1    | 0.0     | 0.0     | 2,045.7   |
| LARKSPUR DITCH (CATLIN)       | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 0.0      | 27.3     | 1.6      | 0.0     | 0.0     | 0.0     | 28.8      |
| EWING DITCH (PUEBLO)          | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 28.6    | 287.4    | 294.8    | 105.9    | 59.5    | 24.5    | 0.0     | 800.7     |
| COLUMBINE DITCH (PUEBLO)      | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0     | 426.5    | 713.3    | 217.2    | 75.4    | 0.0     | 0.0     | 1,432.4   |
| BOUSTED TUNNEL (SECWCD)       | 0.0     | 0.0   | 0.0   | 0.0   | 0.0   | 1,800.0 | 17,080.0 | 15,560.0 | 2,520.0  | 275.0   | 0.0     | 0.0     | 37,235.0  |
| BUSK-IVANHOE TUNNEL [4]       | 2.0     | 0.0   | 0.0   | 0.0   | 0.0   | 49.8    | 1,248.6  | 1,774.8  | 465.5    | 136.5   | 39.1    | 39.8    | 3,754.3   |
| COLORADO SPGS. BLUE RIVER [5] | 732.0   | 318.0 | 225.0 | 166.0 | 470.0 | 1,218.0 | 1,241.0  | 1,369.0  | 1,114.0  | 589.0   | 934.0   | 717.0   | 9,093.0   |
| TRANSMTN. TOTAL               | 5,531.6 | 348.6 | 249.1 | 190.1 | 498.8 | 6,257.8 | 36,006.5 | 37,992.5 | 13,234.1 | 7,322.1 | 4,543.1 | 2,067.3 | 114,239.6 |

NOTES: [1] Transmountain water diverted into the Arkansas Basin through a facility is generally delivered to some type of storage prior to use. The values reported reflect water diverted into the basin, generally to storage, and not necessarily measured as flow below Pueblo.  
[2] Ownership of Twin Lakes: Colorado Spgs. 54.65%, Pueblo 23.14%, Pueblo West 11.56%, Aurora 4.9%, others 5.75%; (also known as Independence Pass Tunnel).  
[3] Ownership of Homestake: Colorado Spgs. 50%, Aurora 50%.  
[4] Ownership of Busk-Ivanhoe: Pueblo 50%, Aurora 49%, others 1%; (also known as Carlton Tunnel).  
[5] Values show amount of transmountain water "delivered into the Colorado Springs potable water system" through Montgomery Pipeline from the Blue River via Hoosier Tunnel and the South Platte River, as shown in Table 2 of city's Blue River letter report for water year 1989 (October data from subsequent report).  
[6] Aurora owned transmountain water is generally reddiverted into and used in the South Platte River Basin via the Otero Pump Station and Spinney Mountain Reservoir. Total imports for 1989 should be reduced by 22,521 AF to reflect water used by Aurora outside the Arkansas Basin.

**B-17**  
[PREVIOUSLY B-16]  
1989

**SUMMARY TABULATION**  
COMPILED BY COLORADO WATER CON. BD., IN ACRE FEET  
REPORT YEAR ENDING OCTOBER 31, 1989

**B-17**  
[PREV B-16]  
1989

| STATION/DATE                        | SOURCE    | NOV    | DEC    | JAN     | FEB     | MAR     | APR      | MAY      | JUNE    | JULY     | AUG      | SEP     | OCT     | YEAR     |
|-------------------------------------|-----------|--------|--------|---------|---------|---------|----------|----------|---------|----------|----------|---------|---------|----------|
| Arkansas River<br>at Las Animas     | App B-2a  | 5,680  | 8,420  | 8,140   | 9,880   | 5,970   | 3,050    | 7,700    | 7,190   | 19,050   | 16,210   | 3,040   | 2,810   | 97,140   |
| Purgatoire River<br>near Las Animas | App B-2b  | 2,020  | 2,000  | 1,850   | 1,740   | 1,840   | 392      | 1,600    | 628     | 944      | 1,930    | 216     | 756     | 15,916   |
| River Flow into<br>John Martin Res. | App B-2c  | 7,700  | 10,420 | 9,990   | 11,620  | 7,810   | 3,442    | 9,300    | 7,818   | 19,994   | 18,140   | 3,256   | 3,566   | 113,056  |
| End Month Reservoir<br>contents     | App B-3   | 87,300 | 97,800 | 108,000 | 120,000 | 124,000 | 95,300   | 84,400   | 78,500  | 52,800   | 37,400   | 34,600  | 28,300  | N/A      |
| Net Change in JMR                   | calculate | 8,316  | 10,500 | 11,200  | 11,000  | 4,000   | (28,700) | (10,900) | (5,900) | (25,700) | (15,400) | (2,800) | (6,300) | (50,684) |
| Evaporation from<br>JMR             | Table 1   | 998    | 622    | 175     | 161     | 2,282   | 2,875    | 2,851    | 2,656   | 3,616    | 2,047    | 1,506   | 934     | 20,733   |
| Outflow from<br>John Martin Res.    | App B-4   | 369    | 168    | 178     | 191     | 4,320   | 32,390   | 23,140   | 12,240  | 41,760   | 31,880   | 6,210   | 9,920   | 162,766  |
| Diversions in<br>District 67        | App B-14c | 3,620  | 0      | 0       | 0       | 4,046   | 36,028   | 18,476   | 15,555  | 32,859   | 30,159   | 11,974  | 9,475   | 162,193  |
| Arkansas River at<br>Stateline      | App B-7c  | 11,647 | 12,240 | 10,390  | 8,910   | 9,850   | 7,330    | 19,636   | 8,900   | 17,350   | 22,130   | 6,844   | 9,890   | 145,217  |
| Diversions by<br>ditches in Kansas  | App B-15  | 2,333  | 0      | 0       | 912     | 5,950   | 7,072    | 9,242    | 3,951   | 11,289   | 18,460   | 3,403   | 8,881   | 71,493   |

NOTES: [1] Beginning contents of JMR at 0001 hours, Nov. 1, 1988 was 78,983.57 AF.  
[2] Diversions by ditches in Kansas include 4,073 AF diverted and then returned directly to the River, see Appendix B-15 and notes 1, 3, and 4 thereof.

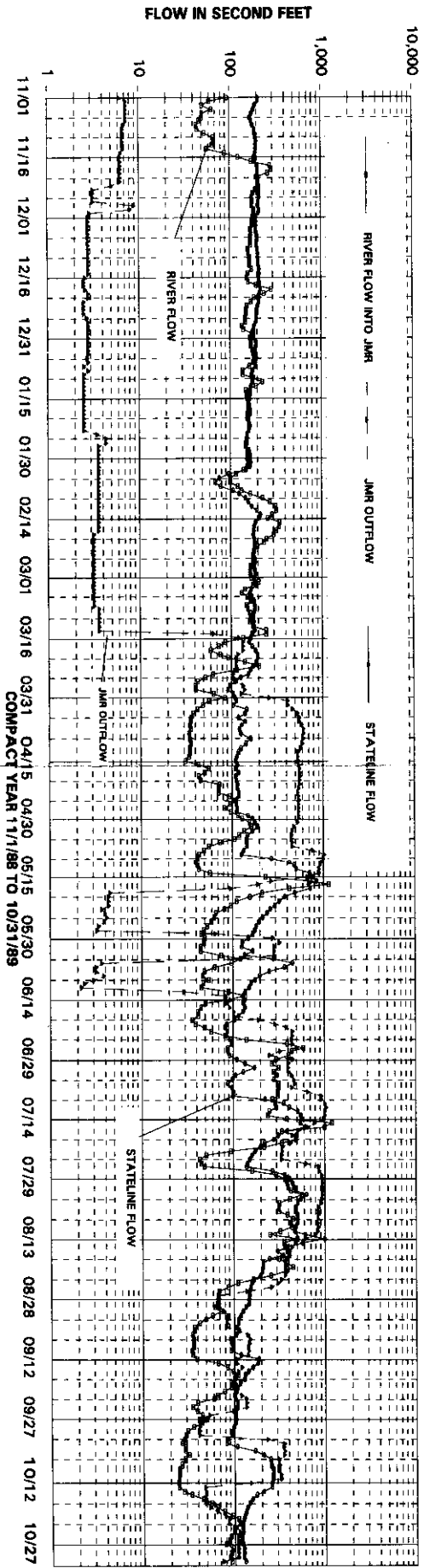
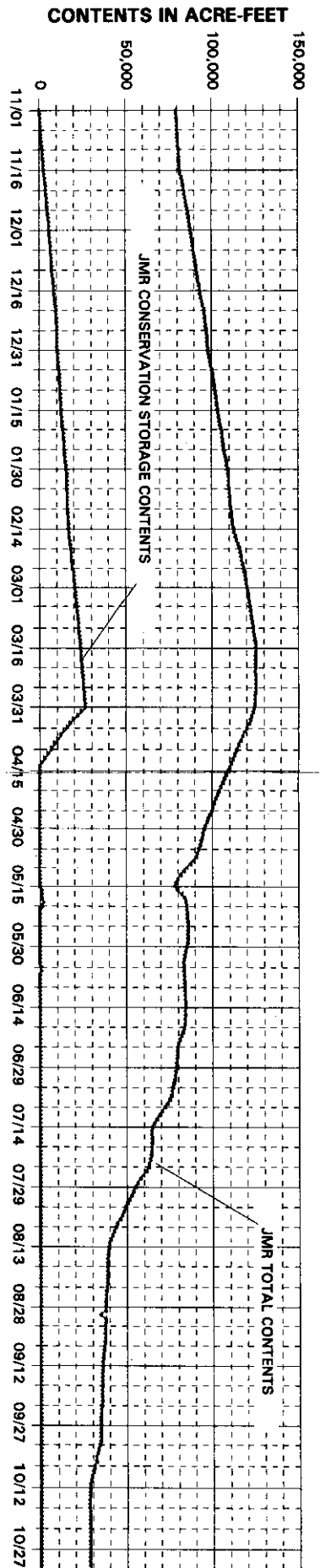


PLATE I: INFLOW, OUTFLOW, STATELINE FLOW, AND CONTENTS JMR