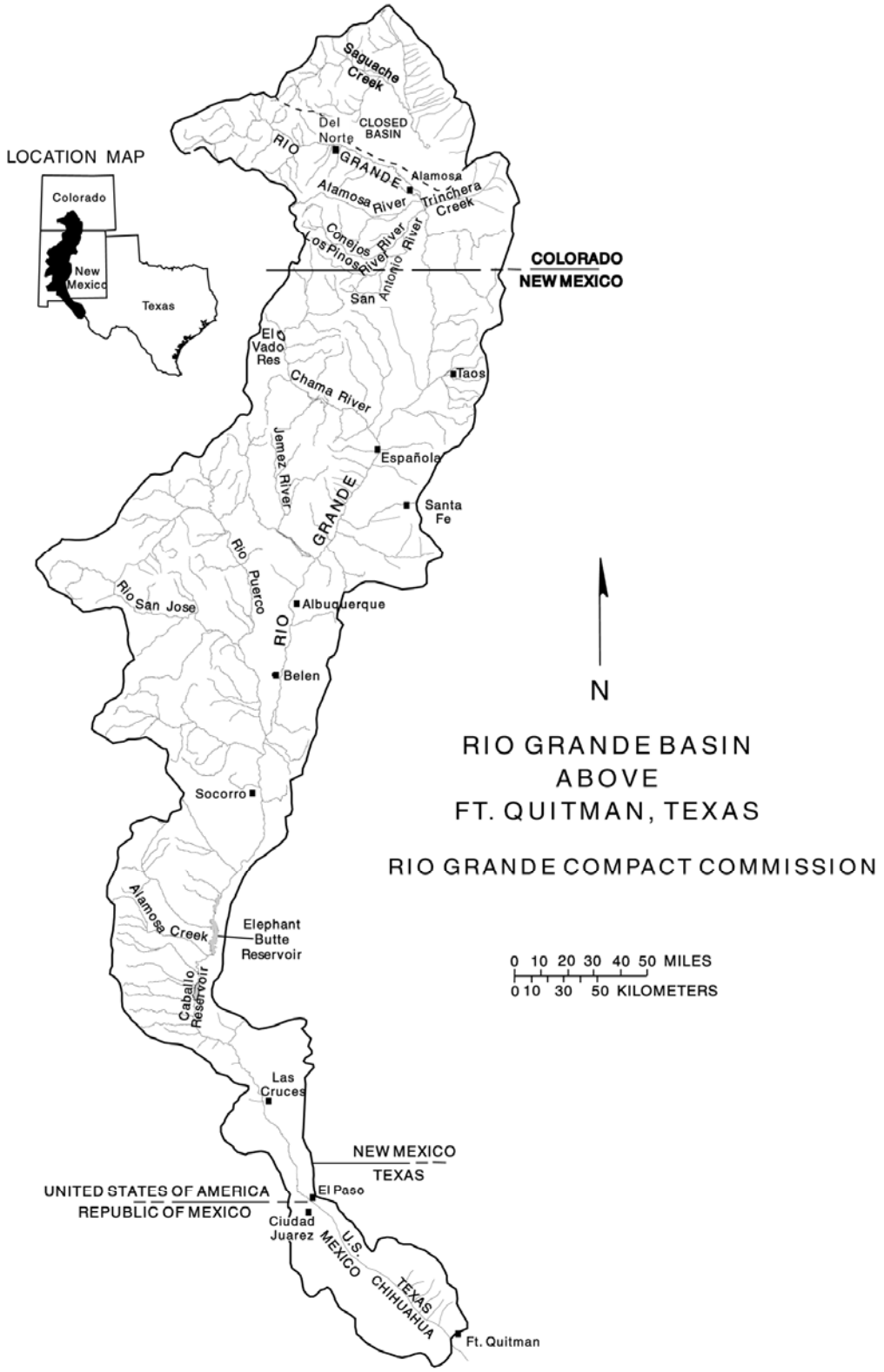
REPORT

of the

# RIO GRANDE COMPACT COMMISSION

## 2009

TO THE GOVERNORS OF
Colorado, New Mexico and Texas


LOCATION MAP
Colorado
New Mexico
Texas
Saguache Creek
Del Norte
CLOSED BASIN
RIO GRANDE
Alamosa
Alamosa River
Trinchera Creek
Conejos River
Los Pinos River
San Antonio River
COLORADO
NEW MEXICO
El Vado Res
Chama River
Taos
Jemez River
Española
RIO GRANDE
Santa Fe
Rio Puerco
Rio San Jose
Albuquerque
RIO
Belen
N
RIO GRANDE BASIN
ABOVE
FT. QUITMAN, TEXAS
RIO GRANDE COMPACT COMMISSION
Socorro
Alamosa Creek
Elephant Butte Reservoir
Caballo Reservoir
0 10 20 30 40 50 MILES
0 10 30 50 KILOMETERS
Las Cruces
NEW MEXICO
TEXAS
UNITED STATES OF AMERICA
REPUBLIC OF MEXICO
El Paso
Ciudad Juarez
U.S.
MEXICO
TEXAS
CHIHUAHUA
Ft. Quitman

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## ILLUSTRATIONS

# RIO GRANDE COMPACT COMMISSION
# COLORADO TEXAS NEW MEXICO

March 26, 2010

The Honorable Bill Richardson
Governor of the State of New Mexico
Santa Fe, New Mexico

The Honorable Rick Perry
Governor of the State of Texas
Austin, Texas

The Honorable Bill Ritter
Governor of the State of Colorado
Denver, Colorado

Honorable Governors:

The 71ST Annual Meeting of the Rio Grande Compact Commission was held in Alamosa, Colorado on March 26, 2010.

The Commission reviewed its prior reports and the current reports of the Secretary and the Engineer Advisers relative to streamflow at Compact gaging stations and storage in reservoirs in 2009. The Commission found that:

(a) Deliveries of water at the Colorado-New Mexico state line by Colorado amounted to 299,300 acre-feet in 2009 and the scheduled delivery for the year was 306,700 acre-feet.
(b) Deliveries of water into Elephant Butte Reservoir by New Mexico, as measured by the Elephant Butte Effective Supply, amounted to 622,900 acre-feet in 2009 and the scheduled delivery for the year was 540,000 acre-feet.
(c) The actual release of usable water from Project Storage was 695,000 acre-feet.

The Commission agreed to the accounting of accrued credits for 2009, as follows:

(1) The Commissioners found that the accrued credit for deliveries by Colorado at the Colorado-New Mexico State Line was 1,500 acre-feet on January 1, 2010.
(2) The Commissioners found that the accrued credit for deliveries by New Mexico at Elephant Butte Dam was 180,500 acre-feet on January 1, 2010.

The Honorable Bill Richardson
The Honorable Rick Perry
The Honorable Bill Ritter
March 26, 2010
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(3) The Commissioners found that the accrued departure from normal release from Project Storage as of January 1, 2010 was a credit of 987,000 acre-feet.

The Commission reviewed the cost of operation and found that the expenses of the administration of the Rio Grande Compact were $208,287 in the fiscal year ending June 30, 2009. The United States bore $69,090 of this total; the balance of $139,197 was borne equally by the three States party to the Compact.

Respectfully,

John R. D'Antonio Jr., Commissioner for New Mexico

Patrick R. Gordon, Commissioner for Texas

Dick Wolfe, Commissioner for Colorado

## RECORDS OF DELIVERIES AND RELEASES

At the annual meeting of the Compact Commission on March 26, 2010 the records of deliveries and releases and computations of debits and credits for calendar year 2009 were reported. The records and computations as approved by the Commission are reproduced on the next three pages.

The delivery of water in the Rio Grande at the Colorado-New Mexico State line was obtained from the record of streamflow near Lobatos, Colorado; the scheduled delivery was computed as prescribed in Article III.

The delivery of water by New Mexico to Elephant Butte was computed from the record of streamflow below Elephant Butte Dam and the record of operation of Elephant Butte Reservoir; the scheduled delivery was computed as prescribed in the Resolution of the Commission adopted at the Ninth Annual Meeting held February 22-24, 1948, and published in this report.

The actual release from Project Storage during the year was measured at gaging stations below Caballo Dam. During 2009 the Commissioners found that the actual release of usable water was 695,000 acre-feet. This resulted in an accrued credit of 987,000 acre-feet as of January 1, 2010.

# RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE
## YEAR 2009

Quantities in thousands of acre feet to nearest hundred

| MONTH | CONEJOS INDEX SUPPLY | | | | | | | | | | RIO GRANDE INDEX SUPPLY | | | | | | | | DELIVERIES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MEASURED FLOW | | | | ADJUSTMENTS | | | | SUPPLY | | | ADJUSTMENTS | | | | | SUPPLY | | | | | |
| | CONEJOS AT MOGOTE | LOS PINOS NEAR ORTIZ | SAN ANTONIO AT ORTIZ | TOTAL | STORAGE AT END OF MONTH | CHANGE IN STORAGE | OTHER ADJUSTMENTS | NET ADJUSTMENTS | SUPPLY IN MONTH | ACCUMULATED TOTAL | RECORDED FLOW NEAR DEL NORTE | STORAGE AT END OF MONTH | CHANGE IN STORAGE | TRANSMOUNTIAN DIVERSIONS [b] | OTHER ADJUSTMENTS [a] | NET ADJUSTMENTS | SUPPLY IN MONTH | ACCUMULATED TOTAL | CONEJOS RIVER AT MOUTH NEAR LASAUCES | RIO GRANDE LESS CONEJOS RIVER | RIO GRANDE AT LOBATOS | ACCUMULATED TOTAL AT LOBATOS |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | ------ | ------ | ------ | ------ | 14.2 | ------ | ------ | ------ | ------ | 0.0 | ------ | 0.2 | ------ | ------ | ------ | ------ | ------ | 0.0 | ------ | ------ | ------ | 0.0 |
| JAN | 3.3 | ------ | ------ | 3.3 | 14.4 | 0.2 | | 0.2 | 3.5 | 3.5 | 10.9 | 0.2 | 0.0 | | | 0.0 | 10.9 | 10.9 | 4.6 | 13.2 | 17.8 | 17.8 |
| FEB | 3.2 | ------ | ------ | 3.2 | 14.5 | 0.1 | | 0.1 | 3.3 | 6.8 | 9.9 | 0.2 | 0.0 | | | 0.0 | 9.9 | 20.8 | 4.6 | 15.0 | 19.6 | 37.4 |
| MAR | 6.9 | ------ | ------ | 6.9 | 15.1 | 0.6 | | 0.6 | 7.5 | 14.3 | 19.4 | 0.2 | 0.0 | | | 0.0 | 19.4 | 40.2 | 10.6 | 24.7 | 35.3 | 72.7 |
| APR | 17.3 | 14.4 | 6.1 | 37.8 | 18.9 | 3.8 | | 3.8 | 41.6 | 55.9 | 56.4 | 0.2 | 0.0 | | | 0.0 | 56.4 | 96.6 | 22.0 | 10.6 | 32.6 | 105.3 |
| MAY | 82.3 | 53.7 | 10.2 | 146.2 | 49.6 | 30.7 | 0.1 | 30.8 | 177.0 | 232.9 | 248.7 | 0.2 | 0.0 | | | 0.0 | 248.7 | 345.3 | 59.9 | 32.6 | 92.5 | 197.8 |
| JUN | 59.7 | 12.6 | 0.7 | 73.0 | 51.0 | 1.4 | 0.2 | 1.6 | 74.6 | 307.5 | 126.8 | 0.2 | 0.0 | | | 0.0 | 126.8 | 472.1 | 21.5 | 21.5 | 43.0 | 240.8 |
| JUL | 22.4 | 3.3 | 0.2 | 25.9 | 43.7 | -7.3 | 0.2 | -7.1 | 18.8 | 326.3 | 48.3 | 0.2 | 0.0 | -0.6 | 0.3 | -0.3 | 48.0 | 520.1 | 4.2 | 11.5 | 15.7 | 256.5 |
| AUG | 15.8 | 1.1 | 0.0 | 16.9 | 31.8 | -11.9 | 0.1 | -11.8 | 5.1 | 331.4 | 17.2 | 0.2 | 0.0 | | | 0.0 | 17.2 | 537.3 | 0.5 | 2.6 | 3.1 | 259.6 |
| SEPT | 7.3 | 1.2 | 0.1 | 8.6 | 29.0 | -2.8 | 0 | -2.8 | 5.8 | 337.2 | 15.7 | 0.2 | 0.0 | | | 0.0 | 15.7 | 553.0 | 0.0 | 2.8 | 2.8 | 262.4 |
| OCT | 7.8 | 1.7 | 0.2 | 9.7 | 25.8 | -3.2 | 0.1 | -3.1 | 6.6 | 343.8 | 17.5 | 0.2 | 0.0 | | | 0.0 | 17.5 | 570.5 | 1.1 | 4.3 | 5.4 | 267.8 |
| NOV | 3.4 | ------ | ------ | 3.4 | 26.1 | 0.3 | 0.1 | 0.4 | 3.8 | 347.6 | 12.9 | 0.2 | 0.0 | | | 0.0 | 12.9 | 583.4 | 2.4 | 5.7 | 8.1 | 275.9 |
| DEC | 2.4 | ------ | ------ | 2.4 | 26.5 | 0.4 | | 0.4 | 2.8 | 350.4 | 9.4 | 0.2 | 0.0 | | | 0.0 | 9.4 | 592.8 | 3.1 | 10.3 | 13.4 | 289.3 |
| YEAR | 231.8 | 88.0 | 17.5 | 337.3 | ------ | 12.3 | 0.8 | 13.1 | 350.4 | ------ | 593.1 | ------ | 0.0 | -0.6 | 0.3 | -0.3 | 592.8 | ------ | 134.5 | 154.8 | 289.3 | ------ |

Remarks: Cols. 6 and 13 do not include transmountain water.

[a] Evaporation loss post-compact reservoirs; report of the Engineer Adviser for Colorado.

[b] 836 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

SUMMARY OF DEBITS AND CREDITS

| | ITEM | DEBIT | CREDIT | BALANCE |
|---|---|---|---|---|
| C1 | Balance at Beginning of Year | ------ | ------ | Cr. 10.6 |
| C2 | Scheduled Delivery from Conejos River | 147.3 | ------ | Dr. 136.7 |
| C3 | Scheduled Delivery from Rio Grande | 159.4 | ------ | Dr. 296.1 |
| C4 | Actual Delivery at Lobatos plus 10,000 Acre Feet | ------ | 299.3 | Cr. 3.2 |
| C5 | Reduction of Debits o/c Evaporation | ------ | | |
| C6 | Reduction of Credits o/c Evaporation | 1.7 | ------ | Cr. 1.5 |
| C7 | | | | |
| C8 | Balance at End of Year | ------ | ------ | Cr. 1.5 |

APPROVED:
Engineer Adviser for Colorado CwC Date: 2-26-10 Engineer Adviser for New Mexico RSP Date: 2/26/10 Engineer Adviser for Texas JRS Date: 2/26/10

# RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE
## YEAR 2009

Quantities in thousands of acre feet to nearest hundred

| MONTH | OTOWI INDEX SUPPLY | | | | | | | | | Total Water Stored in New Mexico Above San Marcial at End of Month [a, b] | ELEPHANT BUTTE EFFECTIVE SUPPLY | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ADJUSTMENTS | | | | | | INDEX SUPPLY | | | STORAGE IN ELEPHANT BUTTE RESERVOIR | | | Effective Supply | |
| | | RESERVOIRS: LOBATOS TO OTOWI | | | | | | | | | | | | | |
| | Recorded Flow at Otowi Bridge | Storage End of Month [a, b] | Change in Storage | Reservoir Evaporation | Other Adjustments | Trans-mountain Diversions | Net Adjustments | During Month | Accumulated Total | | End of Month [a] | Change Gain (+) Loss (-) | Recorded Flow Below Elephant Butte Dam | During Month | Accumulated Total |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | ------ | 117.0 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 119.0 | 616.8 | ------ | ------ | ------ | ------ |
| JAN | 46.2 | 122.7 | 5.7 | 0.0 | | -4.7 | 1.0 | 47.2 | 47.2 | 123.5 | 646.8 | 30.0 | 0.2 | 30.2 | 30.2 |
| FEB | 43.9 | 122.9 | 0.2 | 0.1 | | -0.5 | -0.2 | 43.7 | 90.9 | 124.1 | 646.0 | -0.8 | 35.1 | 34.3 | 64.5 |
| MAR | 82.1 | 121.6 | -1.3 | 0.4 | | -0.6 | -1.5 | 80.6 | 171.5 | 122.3 | 587.5 | -58.5 | 98.8 | 40.3 | 104.8 |
| APR | 117.2 | 138.7 | 17.1 | 0.6 | | -7.6 | 10.1 | 127.3 | 298.8 | 138.8 | 542.4 | -45.1 | 106.7 | 61.6 | 166.4 |
| MAY | 277.2 | 182.6 | 43.9 | 1.3 | | -0.2 | 45.0 | 322.2 | 621.0 | 193.1 | 626.3 | 83.9 | 106.1 | 190.0 | 356.4 |
| JUN | 135.4 | 153.9 | -28.7 | 0.7 | | -2.5 | -30.5 | 104.9 | 725.9 | 156.5 | 596.3 | -30.0 | 121.7 | 91.7 | 448.1 |
| JUL | 74.1 | 133.0 | -20.9 | 0.7 | | -9.7 | -29.9 | 44.2 | 770.1 | 133.5 | 510.6 | -85.7 | 127.8 | 42.1 | 490.2 |
| AUG | 64.2 | 89.4 | -43.6 | 0.6 | | -6.2 | -49.2 | 15.0 | 785.1 | 89.3 | 429.0 | -81.6 | 111.9 | 30.3 | 520.5 |
| SEPT | 49.1 | 65.6 | -23.8 | 0.2 | | -7.2 | -30.8 | 18.3 | 803.4 | 65.3 | 411.4 | -17.6 | 52.5 | 34.9 | 555.4 |
| OCT | 44.0 | 55.9 | -9.7 | 0.3 | | -7.4 | -16.8 | 27.2 | 830.6 | 56.1 | 418.0 | 6.6 | 2.0 | 8.6 | 564.0 |
| NOV | 36.7 | 55.9 | 0.0 | 0.1 | | -5.4 | -5.3 | 31.4 | 862.0 | 56.1 | 443.3 | 25.3 | 1.3 | 26.6 | 590.6 |
| DEC | 41.6 | 55.9 | 0.0 | 0.1 | | -6.5 | -6.4 | 35.2 | 897.2 | 56.2 | 474.7 | 31.4 | 0.9 | 32.3 | 622.9 |
| YEAR | 1011.7 | ------ | -61.1 | 5.1 | | -58.5 | -114.5 | 897.2 | ------ | ------ | ------ | -142.1 | 765.0 | 622.9 | ------ |

Remarks: Cols. 3 and 11 reflect implementation of revised area-capacity tables for Abiquiu, Cochiti, and Jemez Canyon Reservoirs, effective January 1, 1999, and El Vado Reservoir, effective January 1, 2009.

[a] Cols. 3, 11, and 12 do not include transmountain water.

[b] Note: Storage in Abiquiu, El Vado, McClure and Nichols Reservoirs under the April 23, 2003 and the February 1, 2008 agreements for relinquishment of accrued credits aggregated 0.0 acre-feet in 2009. Storage of relinquished credit to date aggregated 154,224 acre-feet; balance remaining is 146,276 acre-feet.

SUMMARY OF DEBITS AND CREDITS

| | ITEM | DEBIT | CREDIT | BALANCE |
|---|---|---|---|---|
| NM1 | Balance at Beginning of Year | ------ | ------ | Cr. 116.0 |
| NM2 | Scheduled Delivery at Elephant Butte | 540.0 | ------ | Dr. 424.0 |
| NM3 | Actual Elephant Butte Effective Supply | ------ | 622.9 | Cr.198.9 |
| NM4 | Reduction of Debits o/c Evaporation | ------ | | |
| NM5 | Reduction of Credits o/c Evaporation and Spill | 18.4 | ------ | Cr. 180.5 |
| NM6 | | | ------ | |
| NM7 | | | | |
| NM8 | Balance at End of Year | ------ | ------ | Cr. 180.5 |

APPROVED:
Engineer Adviser for Colorado CWC Date: 2-26-10 Engineer Adviser for New Mexico RSP Date: 2/26/10 Engineer Adviser for Texas HAS Date: 2/24/10

# RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE
## YEAR 2009

Quantities in thousands of acre feet to nearest hundred

| MONTH | [a]Total Project Storage Capacity Available at End of Month | USABLE WATER IN STORAGE | | | Unfilled Capacity of Project Storage at End of Month | CREDIT WATER IN STORAGE | | | Flood Water in Storage in Caballo Reservoir at End of Month | Total Water in Project Storage at End of Month | RIO GRANDE BELOW CABALLO DAM | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Elephant Butte Reservoir | Caballo Reservoir | Total at End of Month | | [c]Colorado Credit Water | [c]New Mexico Credit Water | Total at End of Month | | | Measured Flow at Caballo Gaging Station | Intervening Diversions to Canals | Total Release and Spill | SPILL FROM STORAGE: Caballo Flood Water | SPILL FROM STORAGE: Credit Water | SPILL FROM STORAGE: Usable Water | USABLE RELEASE: Net During Month | USABLE RELEASE: Accumulated Total |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 2,225.0 | [b]490.2 | 21.9 | [b]512.1 | 1,712.9 | [b]10.6 | [b]116.0 | [b]126.6 | | 638.7 | -------- | -------- | -------- | -------- | -------- | -------- | -------- | |
| JAN | 2,225.0 | 520.2 | 23.9 | 544.1 | 1,680.9 | 10.6 | 116.0 | 126.6 | | 670.7 | 0.1 | 0.0 | 0.1 | | | | 0.1 | 0.1 |
| FEB | 2,225.0 | 519.4 | 43.6 | 563.0 | 1,662.0 | 10.6 | 116.0 | 126.6 | | 689.6 | 10.2 | 0.0 | 10.2 | | | | 10.2 | 10.3 |
| MAR | 2,225.0 | 460.9 | 39.6 | 500.5 | 1,724.5 | 10.6 | 116.0 | 126.6 | | 627.1 | 95.1 | 0.4 | 95.5 | | | | 95.5 | 105.8 |
| APR | 2,200.0 | 415.8 | 53.0 | 468.8 | 1,731.2 | 10.6 | 116.0 | 126.6 | | 595.4 | 92.1 | 0.1 | 92.2 | | | | 92.2 | 198.0 |
| MAY | 2,200.0 | 499.7 | 59.3 | 559.0 | 1,641.0 | 10.6 | 116.0 | 126.6 | | 685.6 | 94.4 | 0.3 | 94.7 | | | | 94.7 | 292.7 |
| JUN | 2,200.0 | 469.7 | 64.6 | 534.3 | 1,665.7 | 10.6 | 116.0 | 126.6 | | 660.9 | 112.0 | 0.1 | 112.1 | | | | 112.1 | 404.8 |
| JUL | 2,200.0 | 384.0 | 56.2 | 440.2 | 1,759.8 | 10.6 | 116.0 | 126.6 | | 566.8 | 119.6 | 0.2 | 119.8 | | | | 119.8 | 524.6 |
| AUG | 2,200.0 | 302.4 | 34.3 | 336.7 | 1,863.3 | 10.6 | 116.0 | 126.6 | | 463.3 | 115.3 | 0.1 | 115.4 | | | | 115.4 | 640.0 |
| SEPT | 2,200.0 | 284.8 | 33.7 | 318.5 | 1,881.5 | 10.6 | 116.0 | 126.6 | | 445.1 | 44.9 | 0.0 | 44.9 | | | | 44.9 | 684.9 |
| OCT | 2,225.0 | 291.4 | 25.4 | 316.8 | 1,908.2 | 10.6 | 116.0 | 126.6 | | 443.4 | 10.0 | 0.0 | 10.0 | | | | 10.0 | 694.9 |
| NOV | 2,225.0 | 316.7 | 27.4 | 344.1 | 1,880.9 | 10.6 | 116.0 | 126.6 | | 470.7 | 0.0 | 0.0 | - | | | | 0.0 | 694.9 |
| DEC | 2,225.0 | 348.1 | 29.5 | 377.6 | 1,847.4 | 10.6 | 116.0 | 126.6 | | 504.2 | 0.1 | 0.0 | 0.1 | | | | 0.1 | 695.0 |
| YEAR | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | -------- | 693.8 | 1.2 | 695.0 | 0.0 | 0.0 | 0.0 | 695.0 | -------- |

Remarks: Cols. 2, 6 and 11 reflect implementation of revised area-capacity tables from Elephant Butte and Caballo Reservoirs, effective Jan 1, 2009

[a] Project Storage Capacity is 2,200,030 acre-feet (April to September) and 2,225,030 acre-feet (October to March) as recognized by the September 9, 1998 Resolution of the Rio Grande Compact Commission with flood control storage reservation at Elephant Butte Reservoir of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

[b] Based on Balance at Beginning of Year (C1 and NM1).

c Credit water held constant per direction of Compact Commission in March 2006. Evaporation for credit water is accounted at end of calendar year.

ACCRUED DEPARTURE FROM NORMAL RELEASE

| | ITEM | DEBIT | CREDIT | BALANCE |
|---|---|---|---|---|
| P1 | Accrued Departure at Beginning of Year | ---------- | ---------- | Cr 892.0 |
| P2 | Actual Release during Year | 695.0 | ---------- | Cr. 197.0 |
| P3 | Normal Release for Year | ---------- | 790.0 | Cr. 987.0 |
| P4 | Under Release in Excess of 150.0 | | ---------- | |
| P5 | | ---------- | | |
| P6 | | | | |
| P7 | Accrued Departure at End of Year | ---------- | ---------- | Cr. 987.0 |

TIME OF HYPOTHETICAL SPILL Did not occur

APPROVED:
Engineer Adviser for Colorado CwC Date: 2-26-10 Engineer Adviser for New Mexico RSP Date: 2/26/10 Engineer Adviser for Texas HRS Date: 2/26/10

# REPORT OF THE ENGINEER ADVISERS TO THE RIO GRANDE COMPACT COMMISSION

February 26, 2010

The Engineers Advisers to the Rio Grande Compact Commission met in Santa Fe and Albuquerque, New Mexico from February 22 through 26, 2010 to prepare the 2009 Rio Grande Compact (Compact) water accounting, discuss continuing and new issues in preparation for the 2010 annual meeting of the Rio Grande Compact Commission (Commission) and prepare this report. The Engineer Advisers requested and received the participation of the U.S. Geological Survey (USGS), the U.S. Bureau of Reclamation (Reclamation), the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Indian Affairs (BIA), the International Boundary and Water Commission (IBWC), and the U.S. Fish and Wildlife Service (Service) to discuss in detail their specific water-related activities in the basin.

## COMPACT ACCOUNTING

The Engineer Advisers have reviewed the streamflow and reservoir storage records and other pertinent data for calendar year 2009. As determined by the Engineer Advisers, scheduled and actual deliveries, release of Usable Water for the year 2009, and balances as of January 1, 2010 are as follows:

(a) Deliveries by Colorado at the Stateline:

| | |
|---|---|
| Balance as of January 1, 2009 | 10,600 acre-feet |
| Scheduled delivery | 306,700 acre-feet |
| Actual delivery at Lobatos plus 10,000 acre-feet | 299,300 acre-feet |
| Reduction of credit on account of evaporation | 1,700 acre-feet |
| Accrued credit January 1, 2010 | 1,500 acre-feet |

(b) Deliveries by New Mexico at Elephant Butte Dam:

| | |
|---|---|
| Balance as of January 1, 2009 | 116,000 acre-feet |
| Scheduled delivery | 540,000 acre-feet |
| Actual delivery | 622,900 acre-feet |
| Reduction of credit on account of evaporation | 18,400 acre-feet |
| Accrued credit January 1, 2010 | 180,500 acre-feet |

(c) Project Storage and Releases:

| | |
|---|---|
| Accrued departure (credit) as of January 1, 2009 | 892,000 acre-feet |
| Actual release of Usable Water | 695,000 acre-feet |
| Normal release for year | 790,000 acre-feet |
| Accrued departure (credit) as of January 1, 2010 | 987,000 acre-feet |

Snowmelt runoff levels in 2009 were about average in most of the basin in Colorado and New Mexico. Summer monsoon activity was average to below average throughout most of the basin. Usable Water in Project Storage was above 400,000 acre-feet on January 1, 2009 and stayed above that level until August 12, 2009. Usable Water in Project Storage stayed below 400,000 acre-feet from August 12 until the end of the year. The storage restrictions of Article VII of the Compact were not in effect during the snowmelt runoff, and storage in El Vado Reservoir was maximized in early May. In addition, Abiquiu Reservoir was in flood control operations during most of May, with flood control storage reaching a maximum of 40,800 acre-feet in Abiquiu Reservoir, all of which was released in June. Cochiti Reservoir also stored 10,200 acre-feet during May at the request of the New Mexico State Police to reduce downstream flows to aid in a river search and recovery effort. The San Juan-Chama Project (SJCP) delivered about 105,000 acre-feet through Azotea Tunnel into the Rio Grande basin in 2009.

## CONTINUING ISSUES

This section of the report summarizes issues previously addressed by the Engineer Advisers or the Commission. It reflects information obtained by the Engineer Advisers subsequent to the 2009 Commission meeting, including information obtained in the reports of the federal agencies at the 2010 meeting of the Engineer Advisers.

### Gaging Station Review

The Engineer Advisers continue to monitor the water balance and gage measurements between Elephant Butte and Caballo Reservoirs. During June 2009, a third and final seepage run in the river reach from the gage downstream of Elephant Butte Reservoir to the headwaters of Caballo Reservoir was conducted by the USGS. The results of the seepage run indicated that

this reach lost about 40 cubic feet per second (cfs), approximately two percent of the release, under the flow conditions at the time of measurement. This amount is within the measurement error. The results of the seepage runs indicate that there is no significant loss between the gage below Elephant Butte Reservoir and the headwaters of Caballo Reservoir.

A mass balance for the same reach for calendar year 2009 indicated that there was a 40,000 acre-feet loss in that year. The Engineer Advisers believe that this discrepancy is related to either the record produced by the gage below Elephant Butte Reservoir, the gage below Caballo Reservoir, and/or the stage at Caballo Reservoir and are concerned about this problem.

**Zebra Mussels/Quagga Mussels**

The Engineer Advisers continue to be concerned about the recent infestation of Zebra and Quagga mussels in several locations of Colorado and other neighboring states, and the possibility that waters of the Upper Rio Grande basin may soon be infested. Currently, neither species has been found in the Rio Grande Basin in either Colorado or New Mexico. Due to the concern that the mussels will spread and cause widespread impacts to infrastructure and water facilities within the Basin, Reclamation has been involved in public education and outreach, as well as monitoring at Elephant Butte Reservoir. Federal and state agencies are currently working to contain, control, and prevent the spread of these mussels.

**Federal Agency Efforts towards a New Middle Rio Grande Biological Opinion**

In 2009, Reclamation, the Corps, and the Service continued efforts to develop a new biological opinion for Middle Rio Grande water operations. Starting in August of 2009, as part of its effort to more closely align its work efforts towards recovery of the silvery minnow and Southwestern willow flycatcher while protecting existing and future water uses, the Middle Rio Grande Endangered Species Collaborative Program (Collaborative Program) became more involved in the new biological opinion development process. The Collaborative Program began refining its Long-Term Plan to better align with the Rio Grande silvery minnow and Southwestern willow flycatcher recovery plans. By doing so, the Collaborative Program proposes to submit the plan as the reasonable and prudent alternative for the future biological opinion and to conduct additional projects that proactively aid in recovery of the species.

Additionally, the non-federal participants to the Collaborative Program are seeking to achieve broad and long-term Endangered Species Act coverage for Middle Valley water users that is both reasonable and sustainable.

The technical approach for development of the biological opinion is focused on experiments related to river system operations, population viability analyses to investigate the long-term viability of the silvery minnow, and using the Upper Rio Grande Water Operations Model (URGWOM) to simulate reservoir and river system operations.

The federal agencies plan to submit individual draft biological assessments to the Service by September 30, 2010. The Service will review the draft biological assessments and prepare a single draft biological opinion that will contain an effects analysis but not a reasonable and prudent alternative (RPA). Based on the review, the federal agencies and the Collaborative Program will then negotiate on the components of a final Long-Term Plan and Annual Adaptive Management Plan. Those documents will be submitted to the Service as the proposed RPA for the Corps and Reclamation amended biological assessments. The Service will use the revised information to issue a single final "No Surprises" biological opinion in 2011.

**Compliance by Federal and State Agencies with State Water Law**

The Commission has previously adopted resolutions that requested the Corps, Reclamation, and the Service comply with state law by obtaining permits from the appropriate state agencies for any water related actions, including habitat restoration, that result in new or additional river depletions. Federal agency representatives have acknowledged the need to comply with applicable state laws regarding these projects.

The New Mexico Engineer Adviser reported the NMISC continued to coordinate with the Corps and Reclamation on offset requirements for habitat restoration projects in the Middle Rio Grande. The NMISC entered into Memorandums of Agreement (MOA) with the Corps and Reclamation, which formalized the depletion offset requirements for habitat restoration projects. In addition, the NMISC continues to coordinate with the New Mexico Office of the State Engineer (NMOSE) regarding habitat restoration projects that require offset of depletions, including projects constructed by the NMISC.

**Rio Grande Salinity Management Coalition**

The Engineer Advisers continued to work with the Rio Grande Salinity Management Coalition (Coalition) evaluating the feasibility of salinity capture and treatment in the Rio Grande from San Acacia, New Mexico to Fort Quitman, Texas with emphasis on the Rio Grande Project region. The primary objective of the Coalition is to identify and implement salinity reduction strategies that will reduce impacts, improve Rio Grande water quality, and extend existing water supplies in the fast-growing Rio Grande Project area.

The Coalition seeks to meet these goals through four phases of work:

- Phase 1 – Rio Grande Project Salinity Assessment;
- Phase 2 - Develop Salinity Management Alternatives and Feasibility;
- Phase 3 - Implement Pilot-Scale Salinity Control Project Testing;
- Phase 4 - Full Scale Control Project Implementation, Monitoring and Evaluation

In 2008, the NMISC committed $250,000 for the first phase of work. Those funds were used to match $750,000 from the Corps' Section 729 authority in the Water Resources Development Act of 2007. Phase 1 consisted of developing a baseline salinity budget; conducting preliminary economic damage analysis for residential, agricultural, municipal and industrial uses; identifying critical data gaps; identifying key issues and questions that will direct future study needs; and documenting and integrating salinity data and information. The first phase of work, completed in early 2010, resulted in three deliverables: a geospatial salinity database; a USGS Rio Grande Salinity Assessment and Plan of Study; and a Rio Grande Economic Impact Assessment study.

Phase 2 of the project will commence in 2010. For the second phase, New Mexico has approximately $100,000 remaining from Phase 1 and Texas has indicated they will have $250,000 to match for Phase 2 and/or beyond work. The Coalition has been actively engaged in the collaborative review of Phase 1 deliverables and development of the Phase 2 Scope of Work.

**URGWOM Accounting Model**

During 2009 representatives of Reclamation, Corps, and NMISC met on a monthly basis and conducted quality assurance on model input data and reviewed contractor releases and water

exchanges. That process was proven to be successful and assisted in resolving accounting issues.

The Corps reported on additional developments and updates to URGWOM, including calibration of middle valley low flows, improvement of model accuracy to meet target flows at Central Avenue in Albuquerque and below the Isleta Diversion Dam, drafting of a design document for the inclusion of the Colorado portion of the model(s), and drafting of a conceptual design for the Lower Rio Grande (below Elephant Butte Reservoir), and updating of the URGWOM webpage. Currently, the planning model is being used to assist in evaluating water management scenarios for the development of new biological assessments by the Corps and Reclamation.

Following a 2009 review of the Compact accounting, Reclamation and the NMISC reported that current URGWOM accounting procedures allocate precipitation falling on the reservoirs to stored SJCP and relinquishment water. The Engineer Advisers requested that the URGWOM accounting model be revised to account for precipitation falling on reservoirs as native Rio Grande water. Reclamation was requested and agreed to implement the revised procedures commencing January 1, 2011.

**Elephant Butte Pilot Channel Project**

The pilot channel was successful in conveying the 2009 snowmelt runoff into the active reservoir pool at Elephant Butte Reservoir. As snow-melt runoff flows receded, an approximately 2-mile long sediment plug formed at the top of the active reservoir pool, just downstream of the Red Rock staging area. The sediment plug inhibited flow into the reservoir. NMISC, working cooperatively with Reclamation, excavated a pilot channel through the sediment plug in August and September 2009, and additional work was performed on the spoil bank levees during the winter of 2009-2010.

In partial fulfillment of the Service's biological opinion for the pilot channel, NMISC is working with New Mexico State Parks on habitat restoration projects benefiting the Southwestern willow flycatcher below the reservoir. NMISC has entered into an agreement with State Parks to construct habitat restoration projects and has begun initial soil and hydrologic investigation activities necessary to implement a project for the flycatcher.

**2003 and 2008 New Mexico – Texas Relinquishment Agreements**

Pursuant to Article VII of the Compact, New Mexico and Texas reached agreement on April 23, 2003 for the relinquishment of a total of 122,500 acre-feet of accrued credits in Rio Grande Project Storage. The agreement also provided for relinquishment of an additional 53,000 acre-feet on March 1, 2004, for a total relinquishment over the two years of 175,500 acre-feet. The 2003 relinquishment agreement between New Mexico and Texas allowed the storage of the 175,500 acre-feet of relinquished water in post-1929 reservoirs in New Mexico upstream of Elephant Butte Reservoir over as many years as necessary to capture water when Article VII is in effect. On February 5, 2008, New Mexico and Texas reached agreement for the relinquishment of 125,000 acre-feet of accrued Compact credit water in Elephant Butte Reservoir, effective February 1, 2008.

Relinquishment storage occurred in 2003, 2004, and 2006, totaling 154,224 acre-feet. At the end of 2009, a total of 9,666 acre-feet of relinquished water remained in storage, all in El Vado Reservoir. Of the total 300,500 acre-feet relinquished, 146,276 acre-feet remains available to be stored.

## YEAR 2009 OPERATIONS

**Closed Basin Project**

The total production of the Closed Basin Project in 2009 was 17,360 acre-feet with 13,741 acre-feet of that amount delivered to the Rio Grande. All of the water delivered to the Rio Grande in 2009 was of sufficient quality to qualify for credit under the Compact. Reclamation continues to address problems of biofouling in the production wells of the Closed Basin Project. Reclamation replaced four wells in 2009 that were most affected by iron bacteria, and rehabilitated numerous other wells. To date, 52 of the 150 original wells have been replaced. The new wells and change in operation of all project wells are helping to restore the production of the project. Wells will continue to be replaced as budgetary constraints allow. The Closed Basin Operating Committee continues to monitor groundwater levels and groundwater production and adjust project operations pursuant to the enabling legislation.

**Platoro Reservoir Operations for 2009**

Platoro Reservoir is a post-Compact Reservoir on the Conejos River. For dam safety reasons, the main gate valve in the dam is normally closed during the winter. Because of this, Platoro Reservoir inadvertently stored water in November and December of 2009 while the storage prohibitions of Article VII were in effect. The Conejos Water Conservancy District, which operates the reservoir, is in the process of developing a plan to upgrade the outlet works. This upgrade will hopefully alleviate the inadvertent storage issue that has plagued the reservoir in the past.

**Colorado Groundwater Regulations**

The State Engineer of Colorado is in the process of developing rules and regulations concerning the use of groundwater in the Upper Rio Grande Basin of Colorado. These rules will require the owners of most large capacity wells in the Rio Grande Basin of Colorado to develop a plan to augment any injurious depletions which their wells may cause to other water rights. In the alternative, the owners may enter into a subdistrict which will replace those depletions through a groundwater management plan.

**Reclamation's Supplemental Water Program**

Reclamation's supplemental water program is intended to provide additional water, primarily obtained through the voluntary leasing of SJCP water, for endangered species needs and compliance with the 2003 Biological Opinion. In 2009, Reclamation released a total of 22,113 acre-feet of leased SJCP water to assure compliance with the average year flow targets of the 2003 Biological Opinion. Supplemental water releases were made between July 7 and October 25.

SJCP water leased for the program is released for diversion and use by the MRGCD, which, in turn, allows an equivalent amount of native Rio Grande water (less conveyance losses) to remain in the river.

Reclamation continued to maintain portable pumping stations at four locations in the San Acacia reach. The pumps were operated between July 15 and October 30 to pump 8,075 acre-feet from the Low Flow Conveyance Channel (LFCC) to the Rio Grande under a permit issued by the New Mexico Office of the State Engineer.

**2009 Rio Grande Project Operations and Storage**

Reclamation reported a final 2009 release from Caballo Reservoir of 693,289 acre-feet for all three Rio Grande Project water users: El Paso County Water Improvement District No. 1 (EP No. 1), Elephant Butte Irrigation District (EBID), and Mexico. During 2009, Reclamation allocated 952,200 acre-feet for diversion, which includes a 2008 carryover of 232,882 acre-feet of unused allocation for EP No. 1. Reclamation reported that EBID requested and was charged for diversion of 305,475 acre-feet and EP No. 1 requested and was charged for diversion of 320,116 acre-feet, including 61,139 acre-feet for the City of El Paso.

These values reflect the operations using the new operating manual, as revised during 2009, and resulted in an accrued carryover of 232,914 acre-feet by EP No. 1 (the maximum allowed under the new operating agreement). During the 2009 irrigation season, it was determined that EP No. 1's carryover account would reach its maximum allowable amount prior to end of the season. As a result, EP No. 1, EBID and Reclamation agreed that water, which would otherwise have been transferred to EBID at the end of 2009, would instead be transferred for use during the irrigation season. EBID used 41,701 acre-feet of that water during 2009, resulting in a final carryover for EBID of 40,343 acre-feet. Reclamation reported that Mexico requested and diverted 58,688 acre-feet.

Storage at Elephant Butte Reservoir peaked at about 673,100 acre-feet on June 13, 2009 and storage at Caballo Reservoir peaked at about 75,200 acre-feet on July 7, 2009. End-of-year storage at Elephant Butte Reservoir was about 519,700 acre-feet, which includes 45,100 acre-feet of SJCP water. The end of year storage at Caballo Reservoir was 29,500 acre-feet.

**San Juan-Chama Project Water Conveyance Losses**

The Commission adopted recommendations in 1985 for the accounting of conveyance losses on SJCP water routed to storage in Elephant Butte Reservoir. The adopted loss rates are

based upon the first 1800 cfs of flow below San Acacia being conveyed by the LFCC, with higher flows conveyed by the floodway. If the floodway were to be used, the SJCP water was to absorb the additional initial loss required to prime the floodway channel. The Engineer Advisers reevaluated these loss rates in 1997 and recommended their continued use, even though the LFCC had been inoperable since the mid-1980's.

In 2009, the Engineer Advisers recommended that URGWOM be used to evaluate SJCP conveyance losses between Cochiti and Elephant Butte Reservoirs. Based upon that evaluation, the Engineer Advisers now recommend that a single loss rate value for each month of the year be developed during 2010 for accounting of conveyance losses for future routing of SJCP water to storage in Elephant Butte Reservoir. Additionally, until the Commission approves the new loss rates, the Engineer Advisers recommend that any SJCP water routed to storage in Elephant Butte Reservoir in 2010 be evaluated by Reclamation on a case-by-case basis using URGWOM and that the resulting loss rates must be approved by the Engineer Advisers.

## REPORTS OF THE FEDERAL AGENCIES

Representatives of Reclamation, the Corps, the Service, the IBWC, the USGS, and the BIA presented reports to the Engineer Advisers from February 22 through 25, 2010.

### Rio Grande Project Operations Agreement

Reclamation reported that they, the two Rio Grande Project irrigation districts (EBID and EP No. 1), and the IBWC conducted operations in 2009 as outlined in the March 2008 Rio Grande Project Operating Agreement (Operating Agreement). The Texas and New Mexico Engineer Advisers met on a number of occasions in 2009 to continue the process of reviewing the new Operating Agreement and Operating Agreement Manual (Manual) with Reclamation, EBID, and EP No. 1 to ensure there are no impacts to the Compact. The New Mexico Engineer Adviser reported that New Mexico continues to investigate various concerns it has with the Operating Agreement and Manual. These include New Mexico water resources protection, consistency with the Compact, sustainability, equity and fairness, and transparency. The Colorado Engineer Adviser asked to be kept informed about this issue and of future meetings between the parties to the agreement and New Mexico and Texas Engineer Advisers due to

potential Rio Grande Compact implications.

Reclamation reported EP No. 1, EBID, and Reclamation recently conducted a review of the Manual. The review led to revisions of portions of the Manual to more clearly define operational procedures. Some of the revisions were the result of suggestions from the New Mexico and Texas Engineer Advisers. As EP No. 1, EBID, and Reclamation operate under the new agreement, modifications continue to occur. Reclamation reported that EP No. 1, EBID, and Reclamation are working cooperatively together to implement the Agreement.

The Engineer Advisers request that Reclamation provide copies of the updated Manual to the Engineer Advisers and provide notice of future modifications to the Manual and ongoing operational changes.

**Reclamation's Rio Grande Project Operations Plan for 2010**

Under the February 1, 2010 most probable forecast, Reclamation estimates that Elephant Butte Reservoir storage will peak at 627,975 acre-feet and Caballo Reservoir will peak at 92,585 acre-feet during the spring runoff. Reclamation will begin releases from Caballo Reservoir for the 2010 irrigation season on March 2, 2010 for EP No. 1 and anticipates Mexico's release will begin during the week of March 2, 2010. EBID has not decided when to begin releases.

**Vegetation Management at Elephant Butte and Caballo Reservoirs**

Reclamation continued vegetation management efforts at Elephant Butte and Caballo Reservoirs in 2009 through a cooperative agreement funded by the NMISC. Reclamation reported that a total of 3,802 acres were treated in 2009 at Caballo Reservoir under the program - 2,963 acres by mowing and/or grubbing and 839 acres by herbicidal application. Several thousand acres (mostly saltcedar) have been treated by herbicides over the last five years at both reservoirs with varying degrees of success.

**Middle Rio Grande River Maintenance Plan**

Reclamation completed a long term River Maintenance Plan to provide a technical guide for Reclamation's future river maintenance activities, to meet the original project authorization purposes and environmental compliance needs. Reclamation reported that the plan provides an

engineering and geomorphic review that can be used to readily implement the most cost effective and environmentally sound strategies that reduce Reclamation's long term commitment of resources.

**Middle Rio Grande Project Channel Maintenance**

Reclamation provided a presentation regarding the status of its Middle Rio Grande river channel maintenance program. Since 2004, Reclamation has implemented long-term fixes at thirteen priority sites, implemented interim fixes at five sites, and also performed annual recurring work at six sites due to sediment accumulation. In 2009, Reclamation completed work at two priority sites. There are currently 23 priority sites, and Reclamation plans to complete work at two sites in 2010.

**Cochiti Reservoir Deviation**

At its 70th Annual meeting, the Commission passed a motion approving, with certain conditions, the Corps proposal to implement a five-year water operations strategy at Cochiti Lake and Jemez Canyon Reservoir. The strategy includes deviations from normal operations at Cochiti Lake and/or Jemez Canyon Reservoir to provide downstream recruitment and overbank flows for the benefit of the Rio Grande silvery minnow and the Southwestern willow flycatcher. For the Corps to implement a deviation under the strategy:

- New Mexico must be in an accrued credit status at the beginning of the year,
- The Corps must coordinate with Reclamation, the Service, NMISC, Pueblo de Cochiti, Santa Ana Pueblo, and the Engineer Advisers on the implementation of a deviation, including determining if a deviation is possible and whether a recruitment or overbanking flow is determined beneficial,
- The Corps must secure water or water rights and assure their availability for offset of additional depletions projected to result from a deviation before those operations are conducted in a given year, and
- The Corps must secure the specific advice and consent of the Commission at its annual meeting during each year of the term of the proposed deviation to determine if the conditions of the Resolution are met before a deviation may occur.

The Corps did not request a deviation from normal operations in 2009.

**Cochiti Reservoir Baseline Study**

The Corps reported on an ongoing baseline study designed to evaluate all aspects of operations at Cochiti Reservoir and the impact of those operations on the tribal resources of the Pueblo de Cochiti. The study will include surface and subsurface hydrologic analyses; water and sediment quality analyses; and biological, cultural and economic impact analyses. The study was initiated in 2004 and is currently scheduled for completion in late 2010.

**2008 Six Middle Rio Grande Pueblos Prior and Paramount Operations**

The BIA Designated Engineer provided a report on 2009 Prior and Paramount storage and release activities, projected 2010 storage and release activities, and discussed additional details on the general methodology for Prior and Paramount storage operations and releases with the Engineer Advisers .

Reclamation and BIA individually reported that 16,500 acre-feet was stored in El Vado Reservoir for delivery of irrigation water to the Prior and Paramount lands of the six Middle Rio Grande Pueblos in 2009 in the event that natural flows were insufficient. Article VII of the Compact was not in effect during the 2009 snowmelt runoff; therefore, none of the water stored was captured while the storage restrictions of Article VII of the Compact were in effect. A total of 298 acre-feet of the water was accounted as released during August 2009. The remainder of the water was held in storage until November when it was reallocated as normal Rio Grande storage available in El Vado Reservoir for release to satisfy future irrigation demand within the MRGCD. The Designated Engineer reported the BIA anticipates that Reclamation will store a similar amount of water in 2010.

The Engineer Advisers inquired about both the storage and release operations. The current process is different than the process implemented by Reclamation and the BIA in the early 2000's. The Engineer Advisers remain concerned about the procedures for quantifying storage, release and delivery of water for the Prior and Paramount lands of the six Middle Rio Grande Pueblos.

The Texas Engineer Adviser remains concerned about the storage of native Rio Grande water in El Vado Reservoir by Reclamation when the storage restrictions of Article VII are in effect.

**Bosque Del Apache Sediment Plug**

A sediment plug did not form in the reach of the Rio Grande through the Bosque del Apache National Wildlife Refuge (Refuge) in 2009 although river aggradation resulted in overbanking at approximately 1,000 cfs near the north boundary of the Refuge. Reclamation reported that stabilization work they are performing on the spoil bank levee at this location should be sufficient to pass a short term peak of approximately 8,500 cfs by the spring of 2010. Reclamation reports that sustained flows of over 3,000 cfs in that area for 20 days could result in stability problems, since the levee is not an engineered levee.

The Service is concerned that the current process for excavating sediment plugs may have unintended consequences at the Refuge. Reclamation, the Service, the NMISC and other stakeholders are participating in a process to evaluate alternatives and hopefully develop a long-term solution that reduces flood threat, addresses the Refuge's concerns, and is cost effective.

**Levee Certification**

In 2009, the Corps notified the Engineer Advisers that levees in the Upper Rio Grande Basin had been decertified, including some in Colorado and most of the levees in the middle valley of New Mexico. Some of the levees that were decertified are levees that were designed and constructed by the Corps within the last 15 years.

Some of these levees were decertified due to new inspection criteria, which require that vegetation within 15 feet of the toe of the levee be removed. However, removal of trees to comply with the Corps standards may have ESA and other implications. At the 2010 meeting of the Engineer Advisers, the Corps indicated there are procedures for obtaining a variance for the vegetation setback requirements. The Corps also indicated that they had notified the Federal Emergency Management Agency (FEMA) of the decertifications. FEMA typically classifies areas behind decertified levees as being in the 100-year floodplain.

In response, a task force was formed to address this issue in the middle Rio Grande and is

currently studying the issue. Additionally, the Middle Rio Grande Conservancy District (MRGCD) reconstructed a four-mile section of levee on the west side of the river just below Albuquerque. The IBWC is currently planning and reconstructing levees in the Lower Rio Grande in the reach between Hatch, New Mexico and Ft. Hancock, Texas.

**San Acacia Levee Project**

In November 2009, the Corps completed a Review Plan Limited Re-evaluation Report (Review Plan) for the San Acacia Levee Project, a project originally intended to replace the existing 46 mile-long spoilbank levee from San Acacia to San Marcial with an engineered levee. The Review Plan reaffirmed the economic justification, engineering design and alternative formulation for the project. Some aspects of the original project have changed:

- The portion of the project from Tiffany to the San Marcial Railroad Bridge, a distance of approximately four miles, has been eliminated;
- The San Marcial Railroad Bridge will not be relocated; and,
- The proposed engineered levee will be realigned at the river mile 111 and 113 project areas to conform with spoilbank levee and LFCC setback work recently performed by Reclamation.

The Corps indicated the estimated total project cost is approximately $110 million. They are preparing a Supplemental Environmental Impact Statement on the revised project and anticipate that engineering designs will be finalized in 2010, with construction starting in August 2011.

The New Mexico Engineer Adviser stated the NMISC will have some funding available for Project cost share in 2010 and that the NMISC will be working with the Corps and MRGCD to seek additional cost share funding.

**Southwestern Willow Flycatcher**

Reclamation continues to conduct Southwestern willow flycatcher surveys and nest monitoring along the Rio Grande. Riparian vegetation within the uppermost levels of the conservation pool of Elephant Butte Reservoir holds the largest breeding population of flycatchers in New Mexico. Reclamation indicated that the number of Southwestern willow

flycatcher territories in the conservation pool at Elephant Butte Reservoir increased to 319 territories in 2009 from 229 known territories in 2008. The total number of Southwestern willow flycatcher territories for the Rio Grande from the headwaters to Elephant Butte Reservoir increased to 360 territories in 2009. The Service indicated that it will be important to find ways to redistribute the populations of Southwestern willow flycatchers which are concentrated in the delta of Elephant Butte Reservoir.

The Service reported that a lawsuit had been filed regarding the Southwestern willow flycatcher critical habitat designation. The Service entered into a Settlement Agreement whereby they will review the critical habitat designation and provide a draft analysis by July 15, 2011. The review will look at exceptions from the critical habitat designation relating to certain Pueblo lands, the Refuge, Elephant Butte Reservoir, and certain areas within the Rio Grande Basin in Colorado.

Reclamation submitted a biological assessment to the Service on Rio Grande Project operations in February 2009 for a term of up to five years. Reclamation reported that the biological assessment includes an evaluation of reasonably foreseeable water level elevations at Elephant Butte Reservoir over the next five years under dry, average, or wet inflow conditions. Reclamation received a draft biological opinion from the Service in July 2009. No significant impacts were identified for the next five years based on projected reservoir levels. However, Reclamation indicated that reasonable and prudent alternatives (mitigating habitat losses due to reservoir filling) may be required. Reclamation is planning to provide the draft biological opinion to Elephant Butte Reservoir stakeholders.

**Middle Rio Grande Endangered Species Act Collaborative Program**

In 2009, the Collaborative Program received funding within Reclamation's budget as well as write-in funds totaling about $16 million, which allowed for continuation of activities to comply with the 2003 Biological Opinion and additional activities that contribute to recovery of the listed species. Projects funded in 2009 included habitat restoration, operations and maintenance of four propagation facilities, species research and monitoring, fish passage feasibility studies, water leasing and management, and irrigation decision support system development.

The Executive Committee reached agreement in August 2009 to become a recovery program within the Middle Rio Grande, better aligning the Program activities with the Rio Grande silvery minnow and Southwestern willow flycatcher recovery plans. The Program's Long Term Plan is being revised to incorporate projects and activities to assist in recovery efforts, particularly in the Program area. The Long Term Plan will be used in consultation in a new biological opinion.

The Program has completed significant habitat restoration projects in the Angostura and Isleta reaches to create floodplain habitat for the Rio Grande silvery minnow, including two NMISC projects and a Pueblo of Sandia project. Silvery minnow research projects funded in 2009 included work regarding population estimates, spawning and recruitment, age and growth, and Silvery minnow sampling methodologies. They continue to fund fish passage planning at San Acacia Diversion Dam and other RPA elements of the 2003 Biological Opinion.

**2003 Middle Rio Grande Programmatic Biological Opinion**

The Service reported that Reclamation and the Corps remained in compliance with the 2003 Biological Opinion during 2009, which was a year in which average year flow targets were in effect. As a result, continuous flow was required in the middle valley through June 15, 2009 with 100 cfs flowing over Isleta diversion dam and 50 cfs over San Acacia diversion dam for the remainder of the irrigation season. No river drying occurred in the Isleta reach but drying did occur in a 19 mile long portion of the San Acacia reach above the south boundary of the Refuge between mid-July and early September.

**Rio Grande Silvery Minnow**

The Service reported that they conducted Silvery minnow rescue operations for a total of 25 days between July 16 and the end of the irrigation season, involving salvage, transport and release of 15,190 silvery minnow. Incidental take was reported as 1,611, well within the allowable take limit.

The Service reported that augmentation of silvery minnow occurred only at one location in 2009, within the Refuge, where 21,218 marked fish were released.

The Service reported that during the October 2009 sampling effort, Rio Grande silvery minnow were present at 19 of the 20 sites monitored. Significant numbers of fish were found throughout the middle Rio Grande below Angostura. The Service reported that there was good recruitment of minnow after the snowmelt runoff, but that the number of wild-caught eggs collected during the runoff was low. Therefore, minnow were spawned at the Albuquerque Biopark propagation facility, and larval fish were collected from the river for rearing.

**Silvery Minnow Reintroduction**

The Service released approximately 445,000 silvery minnow for reintroduction into the Big Bend reach of the Rio Grande in Texas in December 2008 and another 509,000 silvery minnow were released in October 2009. Silvery minnows reintroduced in this reach are designated as experimental nonessential under Section 10(j) of the Endangered Species Act. The Service monitored the release sites in May, August, and October 2009. Adult silvery minnow were found near 3 of the 4 release sites in May 2009. No silvery minnow were found during the August or October monitoring efforts. Silvery minnow were also found during monitoring of Terlingua Creek, a tributary of the Rio Grande upstream of Big Bend National Park. The Service indicated that monitoring occurred in February of 2010 at the release sites and found silvery minnow at 3 of the 4 sites.

**Rio Grande Silvery Minnow Recovery Plan**

The Service continued internal work on the revised Silvery Minnow Recovery Plan during 2009. The draft revised Recovery Plan was submitted to the Service by the Silvery Minnow Recovery Team, of which the Engineer Advisers were members, in October 2005. The Service reported at the 2010 Engineer Advisers' meeting that a modified version of the plan had been approved by the Service in January 2010. The Engineer Advisers are concerned that the plan was revised and approved without the participation of the full recovery team.

**International Boundary and Water Commission Activities**

The IBWC provided a report of its activities along the Rio Grande in New Mexico and Texas during 2009. IBWC discussed the Record of Decision issued in June 2009 regarding the

Rectification project and associated required habitat restoration projects. IBWC reported on activities associated with habitat restoration plans associated with their projects and indicated they would provide a list of such projects to the Engineer Advisers. The New Mexico Engineer Adviser asked whether the IBWC had conferred with the New Mexico OSE about the need for water rights permits.

IBWC reported that levee rehabilitation associated with the Canalization and Rectification projects was ongoing along the Rio Grande from Caballo Reservoir downstream through El Paso to the Fort Hancock area. The levee rehabilitation is to insure passage of the 100-year flood event with a three foot freeboard.

IBWC also discussed the Convention of 1906 and water deliveries to Mexico. In 2009, Mexico was provided 58,637 acre-feet of water at their heading. Mexico diverted 57,726 acre-feet of this water. For 2010 the most probable forecast is for a one-hundred percent (100%) allotment (60,000 acre-feet) of water to Mexico.

**BUDGET**

The Engineer Advisers reviewed the Cost of Operation for the year ending June 30, 2009 and the Budget for Fiscal Year ending June 30, 2011. The Engineer Advisers found that the expenses for gaging stations and administration of the Compact for the year ending June 30, 2009 were $208,287. The United States bore $69,090 of this total, with the balance of $139,197 borne equally by the three states.

The proposed budget for the fiscal year ending June 30, 2011 indicates a total of $187,299 will be spent for gaging and administration, with a proposed contribution by the United States of $53,474. The large difference in the costs between these two years is due mostly to a change in the secretarial services contract with the USGS.

Craig Cotten
Engineer Adviser for Colorado

Rolf Schmidt-Petersen
Engineer Adviser for New Mexico

Herman R. Settemeyer
Engineer Adviser for Texas

# RESOLUTION
# OF THE
# RIO GRANDE COMPACT COMMISSION

*WHEREAS, the Rio Grande Compact Commission works closely with various state and local water research agencies, including the New Mexico Water Resources Research Institute (NMWRRI); and*

*WHEREAS, Bobby J. Creel had a distinguished career with the NMWRRI, including service as the Institute's Associate Director; and*

*WHEREAS, the Rio Grande Compact Commission worked closely with NMWRRI and Bobby Creel on numerous water supply and Rio Grande Compact-related issues, primarily regarding the waters of the Lower Rio Grande as they relate to New Mexico, Texas and Mexico; and*

*WHEREAS, during his tenure with the NMWRRI, Bobby Creel encountered many challenging issues, and in meeting those challenges always emerged with representation of the highest quality; and*

*WHEREAS, Bobby Creel unexpectedly lost his life earlier this year after many years of dedicated service to the constituents along the Lower Rio Grande.*

*NOW, THEREFORE, BE IT RESOLVED that the Rio Grande Compact Commission assembled at its 71st Annual Meeting held in Alamosa, Colorado, on March 26, 2010 hereby expresses its sincere condolences on his untimely passing and does hereby acknowledge and express its recognition and appreciation for Bobby Creel's faithful and competent service to the Commission; and*

*BE IT FURTHER RESOLVED that the Engineer Advisers to the Rio Grande Compact Commission are hereby directed to furnish copies of this resolution to the family of Bobby Creel and cause said resolution to be included in the Minutes of the 71st Annual Meeting of the Rio Grande Compact Commission.*

Pat Gordon

*Patrick R. Gordon*
*Texas Commissioner*

*John R. D'Antonio, Jr.*
*New Mexico Commissioner*

Dick Wolfe

*Dick Wolfe*
*Colorado Commissioner*

# RESOLUTION
# OF THE
# RIO GRANDE COMPACT COMMISSION

*WHEREAS, the Rio Grande Compact Commission works closely with various state and local water agencies, including the Rio Grande Water Conservation District and the Rio Grande Water User's Association; and*

*WHEREAS, Ray Wright and Doug Shriver have served in many capacities protecting the interests of water users of the Rio Grande Basin; and*

*WHEREAS, among other positions, Doug Shriver served as the President of the Rio Grande Water User's Association, and Ray Wright served as the Chairman of the Rio Grande Water Conservation District; and*

*WHEREAS, during their many years of dedicated service to the water users of the Upper Rio Grande, Ray Wright and Doug Shriver faced many challenges, and in meeting those challenges gained the respect and admiration of their colleagues; and*

*WHEREAS, Doug Shriver and Ray Wright tragically lost their lives on March 19, 2010.*

***NOW, THEREFORE, BE IT RESOLVED** that the Rio Grande Compact Commission assembled at its 71st Annual Meeting held in Alamosa, Colorado, on March 26, 2010 hereby expresses its sincere condolences on their untimely passing and does hereby acknowledge and express its recognition and appreciation for the faithful and competent service of Ray Wright and Doug Shriver; and*

***BE IT FURTHER RESOLVED** that the Engineer Advisers to the Rio Grande Compact Commission are hereby directed to furnish copies of this resolution to the families of Doug Shriver and Ray Wright and cause said resolution to be included in the Minutes of the 71st Annual Meeting of the Rio Grande Compact Commission.*

Dick Wolfe
Colorado Commissioner

John R. D'Antonio, Jr.
New Mexico Commissioner

Pat Gordon
Patrick R. Gordon
Texas Commissioner

Agreement No: 10C4NM000000015
Customer No: NM007
Project No: 86379L7
Tax ID: 84-0644739 (CO)
85-6000565 (NM)
74-1694284 (TX)
fixed-price agreement

**COOPERATIVE AGREEMENT**
**FOR**
**INVESTIGATION OF WATER RESOURCES**

THIS AGREEMENT, entered into this 1st day of July, 2010 by and between the United States Geological Survey, party of the first part, and each of the Commissioners representing the three signatory states and the Representative of the United States, constituting the Rio Grande Compact Commission, party of the second part.

In consideration of the mutual promises and agreements herein contained, it is agreed by and between the parties hereto as follows:

1. The parties agree that, subject to the availability of appropriations and in accordance with their respective authorities, there shall be maintained a cooperative program for duties as stated in the attached Statement of Work, for the Rio Grande Compact Commission within and among the three states in accordance with the terms of the Rio Grande Compact, incorporated herein by reference.

The parties further agree that this agreement shall in no manner affect any other agreement between the United States Geological Survey and any of the three states of the basin concerning the collection of hydrologic data, but in each case where there is or may be another agreement covering the collection of such data, the duty of the United States Geological Survey as provided here, shall be to compile, correlate, and present hydrographic data that has been collected under such agreements.

2. The parties agree to contribute to this program in the amounts specified or as are from time to time agreed upon in writing, funds needed and available to cover all the cost of the necessary field and office work directly related to the program, excluding any general administrative or accounting work in the office of any of the parties, and excluding the costs of publication by any of the parties of the results of the program.

3. The United States Geological Survey and state members of the Rio Grande Compact agree to contribute to the program during the period from July 1, 2010 to June 30, 2011, the following amounts:

| | | |
|---|---|---|
| (a) | U.S. Geological Survey | $6,875 |
| (b) | State of Colorado | $3,250 |
| (c) | State of New Mexico | $3,250 |
| (d) | State of Texas | $3,250 |

4. So far as may be mutually agreed, all expenses shall be paid in the first instance by the United States Geological Survey with appropriate reimbursement thereafter by the other parties hereto. Each of the parties shall furnish to each of the other parties such statements or reports of expenditures as may be needed to satisfy fiscal requirements.

5. Unless previously terminated by the parties hereto, this agreement shall terminate on June 30, 2011, provided it may be renewed by the mutual agreement of the United States Geological Survey and each of the Commissioners representing the three signatory states to the Rio Grande Compact, as the voting members of the Rio Grande Compact Commission, on or before June 30, 2011, for a period of 1 year, and may be renewed in a like manner on or before June 30th of any year thereafter for a similar period. Any party may terminate this agreement by providing 60 day's written notice to the other party. When an accepted agreement is terminated by the State members of the Rio Grande Compact Commission, the USGS is authorized to collect costs incurred prior to the effective date of termination of the agreement plus any termination cost.

6. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other parties.

7. In the event this Agreement is renewed as herein provided, the amounts to be contributed by the parties for each renewal period may be determined by mutual agreement and set forth by exchange of letters between the parties at or near the beginning of each such period.

8. Billing for this agreement will be rendered semi-annually in January 2011 and July 2011. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30-day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717, Comptroller General File-B212222, August 23, 1983.)

9. The Legal authorities for the U.S. Geological Survey to enter into this Agreement are 43 USC 36C; 43 USC 50; and 43 USC50b.

**UNITED STATES GEOLOGICAL SURVEY**

Linda S. Weiss 3/23/10

Linda S. Weiss Date
Director, New Mexico Water Science Center

**RIO GRANDE COMPACT COMMISSION**

3/26/10

Commissioner for Colorado Date

3/26/10

Commissioner for New Mexico Date

3/26/10

Commissioner for Texas Date

Representative of the United States Date

# Statement of Work
# for
# 10C4NM000000015

The duties of the United States Geological Survey are as follows:

1. Obtain data for yearly accounting from U.S. Geological Survey in New Mexico and Colorado as well as U.S Bureau of Reclamation, Albuquerque and El Paso Offices, and Colorado Division of Water Resources.

2. Prepare and submit provisional water accounting reports on the deliveries of the Rio Grande water.

3. Compile Rio Grande Compact Commission water accounting from the data supplied by various agencies. Present annual accounting at the Engineer Advisor's Meeting. Obtain signature of Engineer Advisors on approved accounting sheets.

**BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2009**

| Item | Total Cost | Borne by United States | Borne by Colorado | Borne by New Mexico | Borne by Texas |
|---|---|---|---|---|---|
| GAGING STATIONS | | | | | |
| In Colorado | $68,630 | $9,085 | $59,545 | | |
| In New Mexico, above Caballo Reservoir | $65,692 | $38,573 | | $27,119 | |
| In New Mexico, Caballo Reservoir and below | $34,979 | $14,382* | | $2,960 | $17,637 |
| Subtotal | $169,301 | $62,040 | $59,545 | $30,079 | $17,637 |
| ADMINISTRATION | | | | | |
| U.S.G.S. Contract | $35,424 | $7,050 | $9,458 | $9,458 | $9,458 |
| Other expenses | $3,562 | | $1,187 | $1,187 | $1,187 |
| Subtotal | $38,986 | $7,050 | $10,645 | $10,645 | $10,645 |
| GRAND TOTAL | $208,287 | $69,090 | $70,190 | $40,724 | $28,282 |
| EQUAL SHARES | | | $46,399 | $46,399 | $46,399 |

* Includes $8,000 to install new accoustical doppler meter at Caballo gaging station during November, 2008 - December, 2009 per Rio Grande Compact Commission Recommendation dated March 22, 2007.

**BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2011**

| Item | Total Cost | Borne by United States | Borne by Colorado | Borne by New Mexico | Borne by Texas |
|---|---|---|---|---|---|
| GAGING STATIONS | | | | | |
| In Colorado | $65,392 | | $65,392 | | |
| In New Mexico, above Caballo Reservoir | $72,174 | $39,559 | | $32,615 | |
| In New Mexico, Caballo Reservoir and below | $29,180 | $7,040 | | $3,130 | $19,010 |
| Subtotal | $166,746 | $46,599 | $65,392 | $35,745 | $19,010 |
| ADMINISTRATION | | | | | |
| U.S.G.S. Technical Services | $16,625 | $6,875 | $3,250 | $3,250 | $3,250 |
| Other expenses | $3,928 | | $1,309 | $1,309 | $1,309 |
| Subtotal | $20,553 | $6,875 | $4,559 | $4,559 | $4,559 |
| GRAND TOTAL | $187,299 | $53,474 | $69,951 | $40,304 | $23,569 |
| EQUAL SHARES | | | $44,608 | $44,608 | $44,608 |

# 2009 WATER RESOURCES DATA

## ACKNOWLEDGEMENTS

This report was prepared by the Engineer Advisers to the Rio Grande Compact Commission. The water-supply data contained in this report was collected by the U.S. Geologicial Survey and provided by various Federal and State agencies.

The office of the State Engineer of Colorado provided records of transmountain diversions and of storage for the following:

Squaw Lake
Rito Hondo Reservoir
Hermit Lakes Reservoir No. 3
Troutvale No. 2 Reservoir
Jumper Creek Reservoir
Big Meadows Reservoir
Alberta Park Reservoir
Shaw Lake Enlargement
Mill Creek Reservoir
Fuchs Reservoir
Platoro Reservoir
Trujillo Meadows Reservoir

The office of the State Engineer of Colorado provided records of discharge for the following:

Rio Grande near Del Norte, Colo.
Conejos River below Platoro Reservoir, Colo.
Conejos River near Mogote, Colo
San Antonio River at Ortiz, Colo
Los Pinos River near Ortiz, Colo.
Conejos River near Lasauses, Colo.
Rio Grande near Lobatos, Colo.

The U.S. Bureau of Reclamation, Albuquerque, N. Mex., provided the following records:

Azotea Tunnel at Outlet, near Chama, N. Mex.
Willow Creek above Heron Res., near Los Ojos, N. Mex.
Horse Lake Creek above Heron Res., near Los Ojos, N. Mex.
Storage in Heron Reservoir near Los Ojos, N. Mex
Willow Creek below Heron Dam, N. Mex.
Storage in El Vado Reservoir near Tierra Amarilla, N. Mex.

The U.S. Geological Survey, in cooperation with the U.S. Bureau of Reclamation, Albuquerque, N. Mex, provided the following records:

Storage in Nambe Falls Reservoir near Nambe, N. Mex.
Rio Nambe below Nambe Falls Dam, near Nambe, N. Mex.

The U.S. Geological Survey supplied the record for Rio Grande below Elephant Butte Dam, and in cooperation with the New Mexico Interstate Stream Commission, also provided the following:

Rio Chama below El Vado Dam, N. Mex.
Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.
Storage in McClure Reservoir near Santa Fe, N. Mex.
Santa Fe River near Santa Fe, N. Mex.
Storage in Nichols Reservoir near Santa Fe, N. Mex.

The U.S. Geological Survey, in cooperation with the Corps of Engineers, Albuquerque, N. Mex., also provided the following records:

Rio Chama below Abiquiu Dam, N. Mex.
Rio Grande below Cochiti Dam, N. Mex.
Galisteo Creek below Galisteo Dam, N. Mex.
Jemez River below Jemez Canyon Dam, N. Mex.

The Corps of Engineers, Albuquerque, N. Mex., provided the following records of storage:

Abiquiu Reservoir.
Galisteo Reservoir.
Jemez Canyon Reservoir.
Cochiti Lake.

The Laguna Agency, Bureau of Indian Affairs, Laguna, N. Mex., supplied the records of storage in Seama Reservoir.

The U.S. Bureau of Reclamation, El Paso, Texas, provided the following records:

Storage in Elephant Butte Reservoir at Elephant Butte, N. Mex.
Storage in Caballo Reservoir near Arrey, N. Mex.
Rio Grande below Caballo Dam, N. Mex.
Bonito ditch below Caballo Dam, N. Mex.

The 2007 report was compiled by Anne-Marie Matherne (U.S. Geological Survey), Secretary to Rio Grande Compact Commission.

The Rio Grande Compact Commission gratefully acknowledges the cooperation received from the agencies listed above.

## ACCURACY OF RECORDS

The Rules and Regulations for the Commission state that the equipment, method, and frequency of meaurement at each gaging station shall be sufficient to obtain records at least equal in accuracy to those classified as “good” by U.S. Geological Survey. Within the physcial limitation of stream gaging, the agencies obtaining the record at Compact gaging station have complied with these regulaitons.

The accuracy of stramflow records depends primarily on (1) the stablity of the stage- discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, meaurements of discharge, and interpretation of records.

The station description states the degree of accuracy attributed to the records. “Excellent” means that about 95 percent of the daily discharges are within 5 percent of the true value; “good” within 10 percent; and “fair” within 15 percent. Records that do not meet the criteria mentioned are rated “poor.” Different accuracies may be attributed to different parts of a given record. The probable error in a monthly or annual mean discharge depends more on the distribution of the daily errors between the limits than it does on the limits themselves. For this reason, monthly and annual records are more accurate than most daily records.

## STREAMFLOW

### Rio Grande near Del Norte, Colo

Location. -- Water-stage recorder, lat 37°41'22", long 106°27'38", in NW 1/4 sec. 29, T. 40 N., R. 5 E., on right bank, 20 ft downstream from county highway bridge, 6 mi west of Del Norte, and 18 mi upstream from Pinos Creek. Datum of gage is 7,980.25 ft above mean sea level, datum of 1929. Prior to May 16, 1908, staff gage at site 4 mi downstream. Records are equivalent.

Drainage area. -- 1,320 sq mi, approximately

Average discharge. -- 118 years (1890-2007), 894 $ft^3/s$ (647,900 acre-ft per year).

Extremes. -- 1889-2007: Maximum discharge, 18,000 $ft^3/s$ Oct. 5, 1911 (gage height, 6.80 ft), from rating curve extended above 12,900 $ft^3/s$; minimum daily, 69 $ft^3/s$ Aug. 21, 1902.

Remarks. -- Records good except those for winter months, which are fair. Flow regulated by four reservoirs, total capacity 126,100 acre-ft, and by several smaller ones. Six transmountain diversions import water into basin above station.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 5,475 | 177 | 190 | 150 | 10,860 |
| February | 4,980 | 178 | 220 | 155 | 9,880 |
| March | 9,782 | 316 | 579 | 220 | 19,400 |
| April | 28,447 | 948 | 2,880 | 277 | 56,420 |
| May | 125,360 | 4,044 | 5,530 | 2,780 | 248,700 |
| June | 63,930 | 2,131 | 2,970 | 1,370 | 126,800 |
| July | 24,344 | 785 | 1,760 | 355 | 48,290 |
| August | 8,661 | 279 | 377 | 218 | 17,180 |
| September | 7,921 | 264 | 307 | 220 | 15,710 |
| October | 8,842 | 285 | 347 | 227 | 17,540 |
| November | 6,517 | 217 | 295 | 148 | 12,930 |
| December | 4,745 | 153 | 170 | 140 | 9,410 |
| Calendar year 2009 | 299,004 | 819 | 5,530 | 140 | 593,100 |

### Conejos River below Platoro Reservoir, Colo.

Location. -- Water-stage recorder and concrete control, lat 37°21'18", long 106°32'37", in NW 1/4NW 1/4 sec. 22, T. 36 N., R. 4 E., on left bank 1,100 ft downstream from valve house for Platoro Reservoir, and 0.7 mi northwest of Platoro. Datum of gage is 9,866.60 ft above mean sea level (levels by Bureau of Reclamation).

Drainage area. -- 40 sq mi, approximately.

Average discharge. -- 55 years (1890-2007), 92.0 $ft^3/s$ (66,660 acre-ft per year).

Extremes. -- 1952-2007: Maximum discharge, 1,160 $ft^3/s$ Nov. 1, 1957; maximum gage height, 4.29 ft June 15, 1958; no flow Oct. 16-20, 1955.

Remarks. -- Records good except those for winter months, which are fair. No diversions above station. Flow completely regulated by Platoro Reservoir (capacity, 59,570 acre-ft).

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 251 | 8.1 | 8.1 | 8.1 | 498 |
| February | 227 | 8.1 | 8.1 | 8.1 | 450 |
| March | 251 | 8.1 | 8.1 | 8.1 | 498 |
| April | 333 | 11 | 17 | 8.1 | 661 |
| May | 1,308 | 42 | 51 | 11 | 2,590 |
| June | 11,392 | 380 | 697 | 111 | 22,600 |
| July | 6,247 | 202 | 332 | 124 | 12,390 |
| August | 6,239 | 201 | 316 | 64 | 12,380 |
| September | 1,820 | 61 | 133 | 29 | 3,610 |
| October | 2,105 | 68 | 115 | 30 | 4,180 |
| November | 250 | 8.3 | 30 | 7.1 | 495 |
| December | 220 | 7.1 | 7.1 | 7.1 | 437 |
| Calendar year 2009 | 30,643 | 84 | 697 | 7.1 | 60,780 |

## STREAMFLOW

### Conejos River near Mogote, Colo

Location. -- Water-stage recorder, lat 37°03'14", long 106°11'13", in SE 1/4SE 1/4 sec. 34, T. 33 N., R. 7 E., on right bank 25 ft upstream from bridge on State Highway 174, 0.4 mi downstream from Fox Creek, and 5.3 mi west of Mogote. Datum of gage is 8,271.54 ft above mean sea level.
Drainage area. -- 282 sq mi.
Average discharge. -- 97 years (1904, 1912-2007), 322 $ft^3/s$ (233,300 acre-ft per year).
Extremes. -- 1903-05, 1911-2007: Maximum discharge, 9,000 ft3/s Oct. 5, 1911 (gage height, 8.50 ft), from rating curve extended above 3,100 $ft^3/s$; minimum daily determined, 10 $ft^3/s$ July 18, 1904.
Remarks. -- Records good except those for winter months, which are fair. Diversions above station for irrigation of about 500 acres. Since 1951 flow partly regulated by Platoro Reservoir.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 1,671 | 54 | 60 | 49 | 3,310 |
| February | 1,616 | 58 | 80 | 50 | 3,210 |
| March | 3,441 | 111 | 223 | 67 | 6,830 |
| April | 8,696 | 290 | 885 | 78 | 17,250 |
| May | 41,483 | 1,338 | 1,830 | 773 | 82,280 |
| June | 30,112 | 1,004 | 1,530 | 664 | 59,730 |
| July | 11,298 | 364 | 760 | 276 | 22,410 |
| August | 7,967 | 257 | 371 | 119 | 15,800 |
| September | 3,692 | 123 | 178 | 81 | 7,320 |
| October | 3,949 | 127 | 181 | 84 | 7,830 |
| November | 1,709 | 57 | 93 | 38 | 3,390 |
| December | 1,224 | 40 | 54 | 30 | 2,430 |
| Calendar year 2009 | 116,858 | 320 | 1,830.0 | 30 | 231,800 |

### San Antonio River at Ortiz, Colo

Location. -- Water-stage recorder, lat 36°59'35", long 106°02'17", in New Mexico in NE1/4SE1/4, sec. 24, T. 32 N., R. 8 E., on left bank 800 ft south of New Mexico-Colorado State line, 0.4 mi southeast of Ortiz, and 0.4 mi upstream from Los Pinos River. Altitude of gage is 7,970 ft.
Drainage area. -- 110 sq mi.
Average discharge. -- 67 years (1941-2007), 25 $ft^3/s$ (17,900 acre-ft per year).
Extremes. -- 1920, 1925-2007: Maximum discharge, 1,750 $ft^3/s$ Apr. 15, 1937 (gage height, 5.38 ft), from rating curve extended above 1,100 $ft^3/s$; no flow at times.
Remarks. -- Records good except those for winter months, which are fair. A few small diversions above station for irrigation.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 149 | 4.8 | 5.8 | 3.0 | 296 |
| February | 133 | 4.7 | 6.5 | 4.0 | 263 |
| March | 643 | 21 | 51 | 10 | 1280 |
| April | 3,069 | 102 | 338 | 11 | 6090 |
| May | 5,147 | 166 | 358 | 26 | 10210 |
| June | 377 | 13 | 25 | 4.7 | 748 |
| July | 109 | 3.5 | 8.2 | 0.9 | 215 |
| August | 15 | 0.48 | 1.8 | 0.0 | 30 |
| September | 37 | 1.2 | 3.2 | 0.0 | 72 |
| October | 81 | 2.6 | 5.6 | 1.0 | 161 |
| November | 85 | 2.8 | 4.4 | 2.2 | 168 |
| December | 51 | 1.6 | 2.4 | 1.0 | 100 |
| Calendar year 2009 | 9,895 | 27 | 358 | 0.0 | 19,630 |

## STREAMFLOW

### Los Pinos River near Ortiz, Colo

Location. -- Water-stage recorder, lat 36°58'56", long 106°04'23", in New Mexico on line between secs. 26 and 27, T. 32 N., R. 8 E., on left bank 0.9 mi south of New Mexico-Colorado State line, 2.1 mi southwest of Ortiz, and 2.9 mi upstream from mouth. Altitude of gage is 8,040 ft.

Drainage area. -- 167 sq mi.

Average discharge. -- 89 years (1915-20, 1925-2007), 117 $ft^3/s$ (84,900 acre-ft per year).

Extremes. -- 1915-20, 1925-2007: Maximum discharge, 3,160 $ft^3/s$ May 12, 1941 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 1,600 $ft^3/s$; minimum observed, 4.0 $ft^3/s$ Dec. 17, 1945.

Remarks. -- Records good except those for winter months, which are fair. Diversions above station for irrigation.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 523 | 17 | 22 | 14 | 1,040 |
| February | 557 | 20 | 30 | 15 | 1,100 |
| March | 1,351 | 44 | 76 | 29 | 2,680 |
| April | 7,243 | 241 | 927 | 38 | 14,370 |
| May | 27,085 | 874 | 1,350 | 431 | 53,720 |
| June | 6,342 | 211 | 392 | 121 | 12,580 |
| July | 1,675 | 54 | 133 | 30 | 3,320 |
| August | 567 | 18 | 34 | 10 | 1,120 |
| September | 594 | 20 | 30 | 11 | 1,180 |
| October | 837 | 27 | 52 | 16 | 1,660 |
| November | 636 | 21 | 26 | 16 | 1,260 |
| December | 391 | 13 | 17 | 8 | 776 |
| Calendar year 2009 | 47,801 | 131 | 1,350 | 8 | 94,810 |

### Conejos River near Lasauses, Colo

Location. -- Water-stage recorder, lat 37°18'01", long 105°44'47", in secs. 2 and 11(two channels), T. 35 N., R. 11 E., on left bank of main channel 125 ft downstream from bridge on State Highway 158 and on left bank of secondary channel 230 ft upstream from bridge, 1.0 mi upstream from mouth, and 2.1 mi north of Lasauses. Datum of gage on main channel is 7,495.02 ft and on secondary (south) channel is 7,496.89 ft above main sea level (levels by Bureau of Reclamation).

Drainage area. -- 887 sq mi.

Average discharge. -- 86 years (1922-2007), 175 $ft^3/s$ (127,000 acre-ft per year).

Extremes. -- 1921-2007: Maximum discharge, 3,890 $ft^3/s$ May 15, 1941; no flow at times in some years.

Remarks. -- Records good except those for winter months, which are fair. Diversions above station for irrigation of about 75,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 2,311 | 75 | 86 | 63 | 4,580 |
| February | 2,335 | 83 | 114 | 73 | 4,630 |
| March | 5,369 | 173 | 336 | 104 | 10,650 |
| April | 11,096 | 370 | 965 | 143 | 22,010 |
| May | 30,188 | 974 | 1,560 | 285 | 59,880 |
| June | 10,831 | 361 | 922 | 169 | 21,480 |
| July | 2,118 | 68 | 416 | 6.6 | 4,200 |
| August | 230 | 7.4 | 19 | 0.3 | 455 |
| September | 0.1 | 0.0 | 0.1 | 0.0 | 0.2 |
| October | 572 | 19 | 46 | 0.0 | 1,130 |
| November | 1,231 | 41 | 63 | 29 | 2,440 |
| December | 1,539 | 50 | 66 | 36 | 3,050 |
| Calendar year 2009 | 67,820 | 186 | 1,560 | 0.0 | 134,500 |

## STREAMFLOW

### Rio Grande near Lobatos, Colo

Location. -- Water-stage recorder, lat 37°04'42", long 105°45'22", in sec. 22, T. 33 N., R. 11 E., on right bank at highway bridge, 6 mi north of Colorado-New Mexico State line, 10 mi east of Lobatos, and 14 mi east of Antonito. Datum of gage is 7,427.63 ft above mean sea level, datum of 1929.

Drainage area. -- 7,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley).

Average discharge. -- 31 years (1900-30), 846 $ft^3/s$ (612,900 acre-ft per year); 77 years (1931-2007) 437 $ft^3/s$ (317,000 acre-ft per year).

Extremes. -- 1899-2007: Maximum discharge observed, 13,200 $ft^3/s$ June 8, 1905 (gage height, 9.1 ft); from rating curve extended above 8,000 $ft^3/s$; no flow at times in 1950-51-51, 1956.

Remarks. -- Records good except those for winter months, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals and diversions for irrigation, and return flow from irrigated areas.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 9,000 | 290 | 330 | 260 | 17,850 |
| February | 9,874 | 353 | 460 | 300 | 19,590 |
| March | 17,786 | 574 | 906 | 438 | 35,280 |
| April | 16,451 | 548 | 1,060 | 314 | 32,630 |
| May | 46,621 | 1,504 | 2,420 | 951 | 92,470 |
| June | 21,689 | 723 | 1,270 | 406 | 43,020 |
| July | 7,895 | 255 | 845 | 107 | 15,660 |
| August | 1,571 | 51 | 111 | 34 | 3,120 |
| September | 1,412 | 47 | 71 | 32 | 2,800 |
| October | 2,736 | 88 | 176 | 32 | 5,430 |
| November | 4,084 | 136 | 197 | 80 | 8,100 |
| December | 6,745 | 218 | 280 | 90 | 13,380 |
| Calendar year 2009 | 145,864 | 400 | 2,420 | 32 | 289,300 |

### Willow Creek above Heron Reservoir, near Los Ojos, N. Mex.

Location. -- Water-stage recorder, lat 36°44'33", long 106°37'34", in Tierra Amarilla Grant, on right bank 200 ft downstream from bridge, 0.2 mi downstream from Iron Spring Creek, 3.3 mi west of Los Ojos, and at mi 9.7. Datum of gage is 7,196.29 ft above mean sea level. Prior to Apr. 1, 1971, at site 900 ft downsteam.

Drainage area. -- 112 sq mi.

Average discharge. -- 7 years (1963-69), 11.5 $ft^3/s$ (8,330 acre-ft per year) prior to completion of Azotea tunnel; 38 years (1970-2007) 134 $ft^3/s$ (97,100 acre-ft per year) subsequent to completion of Azotea tunnel.

Extremes. -- 1962-2007: Maximum discharge, 1,610 $ft^3/s$ Mar. 12, 1985 (gage height, 6.65 ft); no flow at times.

Remarks. -- Records good except those for winter months, which are fair. Subsequent to Nov. 16, 1970, flow affected by transmountain diversions through Azotea tunnel. Flow in Rutheron Drain included prior to Apr. 1, 1971.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| February | 198 | 7.1 | 63 | 0.0 | 393 |
| March | 3,227 | 104 | 306 | 23 | 6,400 |
| April | 10,371 | 346 | 828 | 74 | 20,570 |
| May | 25,567 | 825 | 1,010 | 490 | 50,710 |
| June | 12,042 | 401 | 646 | 298 | 23,890 |
| July | 2,305 | 74 | 262 | 15 | 4,570 |
| August | 125 | 4.0 | 30 | 0.0 | 248 |
| September | 65 | 2.2 | 24 | 0.0 | 129 |
| October | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| November | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| December | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Calendar year 2009 | 53,900 | 148 | 1010 | 0.0 | 106,900 |

## STREAMFLOW

### Horse Lake Creek above Heron Reservoir, near Los Ojos, N. Mex.

Location. -- Water-stage recorder, lat 36°42'24", long 106°44'42", in Tierra Amarilla Grant, on right bank 3.7 mi northwest of Heron Dam, 7.8 mi downstream from Horse Lake, and 9.9 mi west of Los Ojos. Datum of gage is 7,188.85 ft above National Geodetic Vertical Datum of 1929. Prior to July 1, 1971, at site 1,100 ft upstream.
Drainage area. -- 45 sq mi, approximately.
Average discharge. -- 12 years (1963-73,1986), 1.17 $ft^3/s$ (848 acre-ft per year).
Extremes. -- 1963-2007: Maximum discharge, 3,960 $ft^3/s$ July 30, 1968 (gage height, 4.9 ft); no flow most of time.
Remarks. -- Records good. Diversions above station for irrigation of meadows and for off-channel stock tanks.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | --- | --- | --- | --- | --- |
| February | --- | --- | --- | --- | --- |
| March | --- | --- | --- | --- | --- |
| April | --- | --- | --- | --- | --- |
| May | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| June | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| July | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| August | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| September | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| October | --- | --- | --- | --- | --- |
| November | --- | --- | --- | --- | --- |
| December | --- | --- | --- | --- | --- |
| Calendar year 2009 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Willow Creek below Heron Dam, N. Mex.

Location. -- Totalizing flowmeters, lat 36°39'56", long 106°42'12", in Tierra Amarilla Grant, in outlet conduits at Heron Dam, 0.2 mi upstream from Rio Chama, 5.1 mi northeast of El Vado Dam, and 8.7 mi southwest of Los Ojos.
Drainage area. -- 193 sq mi.
Average discharge. -- 37 years (1971-2007), 127 ft3/s (91,960 acre-ft per year).
Extremes. -- 1971-2007: Maximum daily discharge, 2,780 ft3/s Dec. 18, 19, 1982; no flow at times each year.
Remarks. -- Records excellent. Flow completely regulated by Heron Dam.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| February | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| March | 2,010 | 62 | 100 | 0.0 | 1,010 |
| April | 1,550 | 52 | 100 | 0.0 | 781 |
| May | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| June | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| July | 1,120 | 36 | 79 | 0.0 | 565 |
| August | 9,440 | 305 | 523 | 75 | 4,760 |
| September | 2,260 | 754 | 926 | 238 | 1,140 |
| October | 3.5 | 0.1 | 0.4 | 0.0 | 1.8 |
| November | 5080 | 169 | 292 | 0.2 | 2,560 |
| December | 5,070 | 164 | 293 | 1.8 | 2,560 |
| Calendar year 2009 | 26,500 | 128 | 926 | 0.0 | 13,400 |

## STREAMFLOW

### Rio Chama below El Vado Dam, N. Mex

Location. -- Water-stage recorder with satellite telemetry, lat 36°34'48", long 106°43'24", in Tierra Amarilla Grant, on left bank 1.5 mi downstream from El Vado Dam, 2.8 mi upstream from Rio Nutrias, and 13 mi southwest of Tierra Amarilla. Datum of gage is 6,696.12 ft above National Geodetic Vertical Datum of 1929. Prior to October 1935, at site 1.5 mi upstream and October 1935 to September 1938, at site 1.1 mi upstream at different datums.

Drainage area. -- 877 sq mi, of which about 100 sq mi is probably noncontributing.

Average discharge. -- 4 years (1914, 1921-23), 444 ft3/s (321,700 acre-ft per year), prior to completion of El Vado Dam; 35 years (1936-70), 372 ft3/s (269,500 acre-feet per year), prior to release of transmountain water; 37 years (1971-2007) 460 ft3/s (333,300 acre-feet per year).

Extremes. -- 1914-16, 1920-24, 1936-2007; Maximum discharge observed, 9,000 ft3/s May 22, 1920 (gage height, 12 ft); no flow Mar. 25, 26, 31, 1955.

Remarks. -- Records good. Diversions above station for irrigation of about 10,600 acres. Since 1935 flow regulated by El Vado Reservoir and since October 1970 flow partly regulated by Heron Reservoir. Subsequent to May 1971 flow affected by releases of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 3,721 | 120 | 196 | 57 | 7,380 |
| February | 1,634 | 58 | 61 | 51 | 3,240 |
| March | 9,721 | 314 | 541 | 51 | 19,280 |
| April | 20,345 | 678 | 1,650 | 529 | 40,350 |
| May | 65,459 | 2,112 | 5,070 | 871 | 129,800 |
| June | 11,691 | 390 | 879 | 193 | 23,190 |
| July | 19,941 | 643 | 1,100 | 156 | 39,550 |
| August | 29,689 | 958 | 1,320 | 527 | 58,890 |
| September | 18,002 | 600 | 1,080 | 144 | 35,710 |
| October | 11,118 | 359 | 770 | 144 | 22,050 |
| November | 4,511 | 150 | 153 | 148 | 8,950 |
| December | 5,777 | 186 | 201 | 152 | 11,460 |
| Calendar year 2009 | 201,609 | 552 | 5,070 | 51 | 399,900 |

### Rio Chama below Abiquiu Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 36°14'12", long 106°24'59", in SE1/4SE1/4 sec. 8, T. 23 N., R. 5 E., on right bank 0.8 mi downstream from Abiquiu Dam and 5.9 mi northwest of Abiquiu. Altitude of gage is 6,040 ft above National Geodetic Vertical Datum of 1929 (from river-profile map and topographic map).

Drainage area. -- 2,147 sq mi, of which about 100 sq mi is probably noncontributing.

Average discharge. -- 9 years (1962-70), 376 $ft^3/s$ (272,400 acre-ft per year), prior to release of transmountain water; 37 years (1971-2007), 507 ft3/s (367,800 acre-feet per year).

Extremes. -- 1961-2007; Maximum discharge, 2,990 ft3/s July 1, 1965 (gage height, 6.69 ft); minimum, about 0.5 ft3/s Mar. 17, 1966, Jan. 28, 1972.

Remarks. -- Records good. Flow regulated by Heron, El Vado, and Abiquiu Reservoirs. Diversions above station for irrigation of about 17,600 acres. Subsequent to May 1971 flow affected by the release of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 5,187 | 167 | 217 | 98 | 10,290 |
| February | 3,706 | 132 | 299 | 49 | 7,350 |
| March | 11,377 | 367 | 815 | 94 | 22,570 |
| April | 24,022 | 801 | 1,370 | 525 | 47,650 |
| May | 51,650 | 1,666 | 1,770 | 1,220 | 102,400 |
| June | 31,477 | 1,049 | 1,580 | 336 | 62,430 |
| July | 20,640 | 666 | 1,250 | 220 | 40,940 |
| August | 27,525 | 888 | 1,210 | 639 | 54,600 |
| September | 17,716 | 591 | 999 | 205 | 35,140 |
| October | 10,750 | 347 | 751 | 161 | 21,320 |
| November | 4,597 | 153 | 163 | 96 | 9,120 |
| December | 5,059 | 163 | 168 | 160 | 10,030 |
| Calendar year 2009 | 213,706 | 585 | 1,770 | 49 | 423,900 |

## STREAMFLOW

### Rio Nambe below Nambe Falls Dam, near Nambe, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°50'46", long 105°54'17", in NE1/4SW1/4 sec. 29, T. 19 N., R. 10 E., in Nambe Indian Reservation, in outlet conduits at Nambe Falls Dam, 300 ft upstream from Nambe Falls, 2.6 mi upstream from confluence of Rio Nambe and Rio En Medio, 4.4 mi southeast of Nambe Pueblo, and 5.4 mi southeast of Nambe. Datum of gage is 6,840 ft above National Geodetic Vertical Datum of 1929, from topographic map.

Drainage area. -- 34.1 sq mi.

Average discharge. -- -- 29 years (1979-2007), 14 $ft^3/s$ (9,750 acre-feet per year).

Extremes. -- 1979-2007; Maximum discharge, 312 $ft^3/s$ June 9, 1979 (gage height, 1.96 ft), at site 1,100 ft downstream; no flow December 31, 1994.

Remarks. -- Records good. Flow completely regulated by Nambe Falls Reservoir.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 67 | 2.2 | 3.5 | 1.6 | 134 |
| February | 103 | 3.7 | 8.1 | 0.9 | 204 |
| March | 196 | 6.3 | 11 | 2.9 | 388 |
| April | 349 | 12 | 21 | 0.6 | 692 |
| May | 1,244 | 40 | 49 | 22 | 2,470 |
| June | 841 | 28 | 36 | 22 | 1,670 |
| July | 645 | 21 | 27 | 15 | 1,280 |
| August | 414 | 13 | 19 | 7.5 | 820 |
| September | 235 | 7.8 | 13 | 3.9 | 465 |
| October | 126 | 4.1 | 6.3 | 2.4 | 250 |
| November | 30 | 1.0 | 2.4 | 0.7 | 60 |
| December | 29 | 0.9 | 1.1 | 0.9 | 57 |
| Calendar year 2009 | 4,277 | 12 | 49 | 0.6 | 8,480 |

### Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°52'29", long 106°08'30", in SW1/4SW1/4 sec. 18, T. 19 N., R. 8 E., in San Ildefonso Pueblo Grant, 400 downstream from bridge on State Highway 502, 1.8 mi southwest of San Ildefonso Pueblo, 2.5 mi downstream from Pojoaque River, and 6.8 mi west of Pojoaque. Datum of gage is 5,488.48 ft above National Geodetic Vertical Datum of 1929. Prior to May 19, 1904, and July 25 to Oct 1, 1904, staff gage at site 180 ft upstream at datum 2.02 ft lower.

Drainage area. -- 14,300 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 108 years (1896-1905, 1910-2007), 1,510 $ft^3/s$ (1,090,000 acre-feet per year).

Extremes. -- 1895-1905, 1910-2007; Maximum discharge, 24,400 $ft^3/s$ May 23, 1920 (gage height, 14.1 ft); minimum daily, 60 $ft^3/s$ July 4, 5, 1902.

Remarks. -- Records good. Flow partly regulated by Heron, El Vado, and Abiquiu Reservoirs. Diversions above station for irrigation of about 620,000 acres in Colorado and 75,000 acres in New Mexico. Subsequent to May 1971 flow affected by releases of transmountain water from Heron Reservoir.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 23,319 | 752 | 799 | 688 | 46,250 |
| February | 22,137 | 791 | 1,080 | 699 | 43,910 |
| March | 41,400 | 1,335 | 2,020 | 1,020 | 82,120 |
| April | 59,080 | 1,969 | 3,510 | 1,240 | 117,200 |
| May | 139,770 | 4,509 | 5,890 | 3,100 | 277,200 |
| June | 68,280 | 2,276 | 2,990 | 1,340 | 135,400 |
| July | 37,339 | 1,204 | 1,970 | 755 | 74,060 |
| August | 32,351 | 1,044 | 1,290 | 817 | 64,170 |
| September | 24,751 | 825 | 1,140 | 499 | 49,090 |
| October | 22,203 | 716 | 937 | 610 | 44,040 |
| November | 18,483 | 616 | 660 | 559 | 36,660 |
| December | 20,952 | 676 | 756 | 558 | 41,560 |
| Calendar year 2009 | 510,065 | 1,397 | 5,890 | 499 | 1,012,000 |

## STREAMFLOW

### Santa Fe River near Santa Fe, N. Mex.

Location. -- Water-stage recorder with satellite telemetry and concrete control, lat 35°41'12", long 105°50'35", in NE1/4SE1/4 sec. 23, T. 17 N., R. 10 E., 0.4 mi downstream from McClure Dam, and 5.3 mi east of Santa Fe. Altitude of gage is 7,720 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Nov. 4, 1930, at site 1.5 mi downstream, and Apr. 11, 1931 to Sept. 30, 1947, at site 0.3 mi upstream, each at different datum.

Drainage area. -- 18.2 sq mi.

Average discharge. -- 95 years (1913-2007), 8.0 $ft^3/s$ (5,800 acre-feet per year).

Extremes. -- 1913-2007; Maximum discharge, 1,500 $ft^3/s$ Aug. 14, 1921 (gage height, 5.17 ft); from rating curve extended above 150 $ft^3/s$; minimum, no flow Aug. 2-10, 2000.

Remarks. -- Records good. Flow regulated by McClure Reservoir, completed in 1926, raised in 1935 and again in 1947.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 140 | 4.5 | 10 | 1.4 | 278 |
| February | 222 | 7.9 | 9.8 | 4.6 | 440 |
| March | 142 | 4.6 | 4.9 | 4.2 | 282 |
| April | 182 | 6.1 | 9.9 | 4.2 | 360 |
| May | 664 | 21 | 38 | 10 | 1,320 |
| June | 298 | 10 | 16 | 9.1 | 591 |
| July | 370 | 12 | 17 | 7.4 | 733 |
| August | 303 | 9.8 | 14 | 7.1 | 601 |
| September | 200 | 6.7 | 7.1 | 6.5 | 397 |
| October | 144 | 4.6 | 6.5 | 1.7 | 285 |
| November | 53 | 1.8 | 1.8 | 1.6 | 104 |
| December | 50 | 1.6 | 1.7 | 1.5 | 100 |
| Calendar year 2009 | 2,767 | 7.6 | 38 | 1.4 | 5,490 |

### Rio Grande below Cochiti Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°37'05", long 106°19'24", in SW1/4NE1/4 sec. 17, T. 16 N., R. 6 E., in Pueblo de Cochiti Grant, 320 ft upstream from bridge on State Highway 22, 700 ft downstream from Cochiti Dam, and 1.4 mi northeast of Cochiti Pueblo. Datum of gage is 5,226.08 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 14, 1973, at site 2.4 mi downstream at altitude 5,210 ft, from topographic map. Nov. 14, 1973 to Jan. 8, 1976, at site 320 ft downstream at datum 1.79 ft lower.

Drainage area. -- 14,900 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 37 years (1971-2007), 1,330 $ft^3/s$ (962,000 acre-feet per year).

Extremes. -- 1971-2007; Maximum discharge, 10,300 $ft^3/s$ July 26, 1971 (gage height, 7.90 ft) at site 2.4 mi downstream prior to closure of Cochiti Dam; from rating curve extended above 2,600 $ft^3/s$; minimum discharge 0.51 $ft^3/s$ Aug. 3-5, 1977, Aug. 27-28, 1978.

Remarks. -- Records good. Since Nov. 12, 1973, flow completely regulated by Cochiti Dam. Cochiti Eastside Main Canal on left bank and Sili Main Canal on right bank bypass station.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 23,639 | 763 | 843 | 495 | 46,890 |
| February | 22,280 | 796 | 1,020 | 667 | 44,190 |
| March | 38,487 | 1,242 | 1,890 | 881 | 76,340 |
| April | 56,170 | 1,872 | 3,340 | 1,140 | 111,400 |
| May | 129,630 | 4,182 | 5,300 | 1,570 | 257,100 |
| June | 67,143 | 2,238 | 3,400 | 960 | 133,200 |
| July | 35,793 | 1,155 | 1,910 | 947 | 71,000 |
| August | 29,148 | 940 | 1,070 | 752 | 57,820 |
| September | 20,018 | 667 | 963 | 314 | 39,710 |
| October | 16,958 | 547 | 701 | 433 | 33,640 |
| November | 16,140 | 538 | 653 | 435 | 32,010 |
| December | 20,398 | 658 | 791 | 489 | 40,460 |
| Calendar year 2009 | 475,804 | 1,304 | 5,300 | 314 | 943,800 |

## STREAMFLOW

### Galisteo Creek below Galisteo Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°27'53", long 106°12'49", in NE1/4NE1/4 sec. 8, T. 14 N., R. 7 E., in Mesita de Juana Lopez Grant, on right bank 0.4 mi downstream from Galisteo Dam, 5.3 mi northwest of Cerrillos, and at mile 11.4. Elevation of gage is 5,450 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Dec. 21, 1981, at site 1,200 ft downstream at different datum.
Drainage area. -- 597 sq mi.
Average discharge. -- -- 37 years (1971-2007), 5.0 $ft^3/s$ (3,900 acre-feet per year).
Extremes. -- 1970-2007; Maximum discharge, 3,460 $ft^3/s$ Aug. 24, 1997 (gage height, 5.57 ft); no flow many days each year.
Remarks. -- Records poor. Flow partly regulated by uncontrolled outlet in Galisteo Dam. Capacity of outlet, 5,000 $ft^3/s$ when reservoir is full. Diversions for irrigation of about 50 acres above reservoir.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| February | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| March | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| April | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| May | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| June | 27 | 0.91 | 17 | 0.0 | 54 |
| July | 84 | 2.7 | 65 | 0.0 | 168 |
| August | 4.2 | 0.13 | 3.4 | 0.0 | 8.2 |
| September | 233 | 7.8 | 232 | 0.0 | 462 |
| October | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| November | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| December | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Calendar year 2009 | 349 | 1.0 | 232 | 0.0 | 692 |

### Jemez River below Jemez Canyon Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°23'24", long 106°32'03", in NE1/4 sec. 5, T. 13 N., R. 4 E., 0.8 mi downstream from Jemez Canyon Dam, 2.0 mi upstream from mouth, and 6 mi north of Bernalillo. Datum of gage is 5,095.60 ft above National Geodetic Vertical Datum of 1929. Prior to April 24, 1951, at site three-quarters mi upstream at datum 24.51 ft higher. April 24, 1951 to June 25, 1958, at site 37 ft upstream at datum 4.40 ft higher.
Drainage area. -- 1,038 sq mi.
Average discharge. -- 65 years (1937, 1944-2007), 61$ft^3/s$ (44,400 acre-feet per year).
Extremes. -- 1937, 1944-2007; Maximum discharge, 16,300 $ft^3/s$ Aug. 29, 1943 (gage height, 5.62 ft); no flow at times.
Remarks. -- Records good. Flow regulated by Jemez Canyon Dam since October 1953. Diversions for irrigation of about 3,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 587 | 19 | 26 | 14 | 1,160 |
| February | 686 | 25 | 182 | 8.4 | 1,360 |
| March | 2,214 | 71 | 133 | 38 | 4,390 |
| April | 3,180 | 106 | 224 | 7.3 | 6,310 |
| May | 3,552 | 115 | 237 | 20 | 7,050 |
| June | 598 | 20 | 145 | 0.0 | 1,190 |
| July | 47 | 1.5 | 33 | 0.0 | 94 |
| August | 2.1 | 0.1 | 2.0 | 0.0 | 4.2 |
| September | 661 | 22 | 268 | 0.0 | 1,310 |
| October | 104 | 3.4 | 13 | 0.0 | 207 |
| November | 291 | 10 | 15 | 5.0 | 576 |
| December | 403 | 13 | 26 | 1.6 | 799 |
| | 12,325 | 34 | 268 | 0.0 | 24,450 |

## STREAMFLOW

### Rio Grande below Elephant Butte Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 33°08'54", long 107°12'22", in SW1/4 sec. 25, T. 13 S., R. 4 W. (projected), in Pedro Armendariz Grant, 1.0 mi downstream from dam and 1.5 mi upstream from Cuchillo Negro River. Datum of gage is 4,241.09 ft above national Geodetic Vertical Datum of 1929. Prior to April 23, 1942, at several different sites and datums.

Drainage area. -- 29,450 sq mi approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 93 years (1915-2007), 998 $ft^3/s$ (723,000 acre-feet per year).

Extremes. -- 1915-2007; Maximum daily discharge, 8,220 $ft^3/s$ May 22, 1942; no flow at times prior to 1929 and March 2-4, 1979.

Remarks. -- Records good. Flow regulated by Elephant Butte Reservoir. Diversions for irrigation of about 800,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 124 | 4.0 | 8.1 | 1.8 | 245 |
| February | 17,677 | 631 | 1900 | 5.0 | 35,060 |
| March | 49,810 | 1,607 | 2,570 | 1,210 | 98,800 |
| April | 53,770 | 1,792 | 2,310 | 1,290 | 106,700 |
| May | 53,480 | 1,725 | 2,030 | 1,510 | 106,100 |
| June | 61,340 | 2,045 | 2,430 | 1,490 | 121,700 |
| July | 64,450 | 2,079 | 2,520 | 1,780 | 127,800 |
| August | 56,403 | 1,819 | 2,540 | 894 | 111,900 |
| September | 26,460 | 882 | 922 | 368 | 52,480 |
| October | 1,021 | 33 | 49 | 25 | 2,030 |
| November | 683 | 23 | 33 | 17 | 1,350 |
| December | 474 | 15 | 19 | 14 | 940 |
| Calendar year 2009 | 385,691 | 1,057 | 2570 | 1.8 | 765,000 |

### Rio Grande below Caballo Dam, N. Mex.

Location. -- Water-stage recorder, lat 32°53'05", long 107°17'31", in NE1/4SW1/4 sec. 30, T. 16 S., R. 4 W., 2,000 ft upstream from Interstate Highway 25, 4,200 ft downstream from Caballo Dam, 1.3 mi upstream from Percha diversion dam, and 3 mi northeast of Arrey. Datum of gage is 4,140.90 ft above National Geodetic Vertical Dam of 1929. October 13, 1938 to December 31, 1945, at datum 5.0 ft higher.

Drainage area. -- 30,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Average discharge. -- 70 years (1938-2007), 925 $ft^3/s$ (670,000 acre-feet per year).

Extremes. -- 1938-2007; Maximum daily discharge, 7,650 $ft^3/s$ May 20, 1942; minimum daily, 0.1 $ft^3/s$ Oct. 31 to Nov. 14, 1954, Nov. 7 to Dec. 31, 1955, Feb. 15-29, 1972.

Remarks. -- Records good. Flow regulated by Elephant Butte Reservoir and Caballo Reservoirs. Diversions for irrigation of about 800,000 acres above station.

Monthly and yearly discharge, in cubic feet per second

| Month | Second-foot-days | Maximum daily | Minimum daily | Mean | Runoff in acre-feet |
|---|---|---|---|---|---|
| January | 40 | 1.3 | 2.0 | 1.0 | 79 |
| February | 5,159 | 184.0 | 687 | 1.0 | 10,230 |
| March | 47,942 | 1,547 | 2440 | 627 | 95,090 |
| April | 46,440 | 1,548 | 1,950 | 1,260 | 92,110 |
| May | 47,590 | 1,535 | 1,920 | 1,040 | 94,390 |
| June | 56,450 | 1,882 | 2,350 | 1,210 | 112,000 |
| July | 60,295 | 1,945 | 2,620 | 492 | 119,600 |
| August | 58,120 | 1,875 | 2,130 | 1,550 | 115,300 |
| September | 22,639 | 755 | 2,010 | 295 | 44,900 |
| October | 5,073 | 164 | 446 | 2.0 | 10,060 |
| November | 30 | 1.0 | 1.0 | 1.0 | 60 |
| December | 31 | 1.0 | 1.0 | 1.0 | 61 |
| Calendar year 2009 | 349,809 | 958 | 2620 | 1.0 | 693,800 |

## STREAMFLOW

### Bonito Ditch below Caballo Dam, N. Mex.

Records available. -- January 1938 to current year. Published as supplementary data with Rio Grande below Caballo Dam in U.S.G.S. Water-Supply Papers and Water-Data Reports beginning with October 1947.

Remarks. -- Ditch diverts directly from Caballo Reservoir for irrigation of lands on right bank of river. The total release from Project Storage, as used in computations of Compact Commission, is the combined flow of this ditch and Rio Grande below Caballo Dam.

| | Diversion, in acre-ft |
|---|---|
| January | 0.0 |
| February | 34.5 |
| March | 363.3 |
| April | 98.0 |
| May | 282.6 |
| June | 111.2 |
| July | 163.3 |
| August | 89.7 |
| September | 59.3 |
| October | 22.5 |
| November | 0.0 |
| December | 0.0 |
| Calendar year 2009 | 1,224.4 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in Colorado
### (constructed or enlarged since 1937)

Squaw Lake. – Staff gage in sec. 12, T. 39 N., R. 4 W., on tributary to Squaw Creek. Completed in 1938; capacity, 162 acre-ft by 1953 survey. Water is used for irrigation below gaging station on Rio Grande near Del Norte.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | 9.1 | - |
| Contents | 162 | 162 | 162 | 162 | 162 | 162 | 162 | 162 | 162 | 162 | 162 | 162 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Rito Hondo Reservoir. – Staff gage in sec. 22, T. 42 N., R. 3 W., on Rito Hondo (Deep Creek) tributary to Clear Creek. Completed in 1957; capacity, 561 acre-ft. Originally filled during May and June 1958 with transmountain water; storage is not in debit status. Water is used for fish culture.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | - |
| Contents | 561 | 561 | 561 | 561 | 561 | 561 | 561 | 561 | 561 | 561 | 561 | 561 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Hermit Lakes Reservoir No.3. – In sec. 25, T. 41 N., R. 4 W., on South Clear Creek. Completed prior to 1960; capacity, 192 acre-ft. Capacity table based on elevation above bottom of outlet. Water is used for fish culture. Includes 169 acre-feet of transmountain water by exchange in 1984 and 23 acre-ft of transmountain water by exchange in 1985.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - |
| Contents | 192 | 192 | 192 | 192 | 192 | 192 | 192 | 192 | 192 | 192 | 192 | 192 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Troutvale No. 2 Reservoir. – Staff gage in E1/2 sec. 10, T. 41 N., R. 3 W., on South Clear Creek. Completed in 1940; capacity, 435 acre-ft. Condition of spillway limited storage to 168 acre-ft after May 1942. Repairs to spillway in 1947 increased capacity to 257 acre-ft. Water is used for fish culture with only occasional sale for irrigation. Storage omitted from accounting by action of Commission on Feb. 15, 1962.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | - |
| Contents | 213 | 213 | 213 | 213 | 213 | 213 | 213 | 213 | 213 | 213 | 213 | 213 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in Colorado
### (constructed or enlarged since 1937)

Jumper Creek Reservoir. – In sec. 5, T. 39 N., R. 2 W., on Jumper Creek, tributary to Trout Creek. Completed in 1951; capacity, 38 acre-ft. Capacity table based on elevation above bottom of outlet. Storage omitted from accounting by action of Commission on Feb. 15, 1962.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | - |
| Contents | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Big Meadows Reservoir. – In NW1/4 sec. 17, T. 38 N., R. 2 E., on South Fork about 0.9 mi upstream from Hope Creek. Completed in 1967; capacity, 2,437 acre-ft. Capacity table based on elevation above outlet. Water is used for fish culture. Includes 140 acre-ft of transmountain water, by exchange, in 1967; 838 acre-ft, by exchange, in 1968; 347 acre-ft, by exchange, in 1969; and 1,112 acre-ft, by exchange, in 1983, for a total of 2,437 acre-ft.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | 45.0 | - |
| Contents | ,437 | ,437 | ,437 | ,437 | ,437 | ,437 | ,437 | ,437 | ,437 | 2,437 | 2,437 | 2,437 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Alberta Park Reservoir. – In sec. 34, T. 38 N., R. 2 E., on Pass Creek. Completed in 1953; capacity, 598 acre-ft. Capacity table based on elevation above bottom of outlet. Storage prior to June 30, 1983 included 244 acre-ft of transmountain water imported in 1963. By a 1983 resolution of the Rio Grande Compact Commission, the reservoir was drained for repairs in July 1983; recovery was completed in 1984. The reservoir also contains 100 acre-ft of transmountain water stored by exchange in 1983 and 254 acre-ft of transmountain water stored in 1984.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 | 21.0 | 21.0 | 21.0 | 27.0 | 27.0 | - |
| Contents | 598 | 598 | 598 | 598 | 598 | 598 | 598 | 394 | 394 | 394 | 598 | 598 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -204 | 0 | 0 | +204 | 0 | 0 |

Shaw Lake Enlargement. – sec. 5, T. 38 N., R. 2 E., on tributary to Lake Creek. Capacity, 638 acre-ft by 1916 decree; enlarged in 1955 to 681 acre-ft. Only the storage in excess of 638 acre-ft is subject to terms of Rio Grande Compact. Includes 42 acre-ft of transmountain water imported in 1965.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Contents | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in Colorado
### (constructed or enlarged since 1937)

Mill Creek Reservoir. – In sec. 16, T. 39 N., R. 3 E., on Mill Creek. Completed in 1953; capacity, 43 acre-ft. Capacity based on elevation above bottom of outlet. Includes 43 acre-ft of transmountain water, by exchange, in 1976.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | - |
| Contents | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Fuchs Reservoir. – Staff gage in sec. 2, T. 37 N., R. 4 E., on East Pinos Creek. Completed in 1939; capacity, 237 acre-ft with 2 ft of flash boards in spillway. Prior to calendar year 1999, contents reported as 238 acre-ft were actually 237 acre-ft. Pinos Creek enters Rio Grande below station near Del Norte.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 17.2 | 17.2 | 17.2 | 17.2 | 17.2 | 13.4 | 12.4 | 9.5 | 7.4 | 7.3 | 9.8 | 12.0 | - |
| Contents | 237 | 237 | 237 | 237 | 237 | 155 | 136 | 80 | 56 | 55 | 91 | 128 | - |
| Change | 0 | 0 | 0 | 0 | 0 | -82 | -19 | -56 | -24 | -1 | +36 | +37 | -139 |

Platoro Reservoir. – Water-stage recorder in NW1/4 sec. 22, T. 36 N., R. 4 E., on Conejos River. Completed in 1951; capacity, 59,570 acre-ft at crest of spillway. Reservoir is used for irrigation and flood control. Storage affects Conejos Index Supply. Contents include 3,000 acre-ft of transmountain water stored by exchange in April 1985 on behalf of the Colorado Division of Wildlife.

Month-end elevation, in feet, and contents, in acre-feet

| Date | Elevation | Contents | Change in contents |
|---|---|---|---|
| December 31, 2008 | 9,977.94 | 17,228 | - |
| January 31, 2009 | 9,978.21 | 17,374 | +146 |
| February 28 | 9,978.49 | 17,525 | +151 |
| March 31 | 9,979.53 | 18,088 | +563 |
| April 30 | 9,986.15 | 21,888 | +3,800 |
| May 31 | 10,026.50 | 52,583 | +30,695 |
| June 30 | 10,028.10 | 54,049 | +1,466 |
| July 31 | 10,020.00 | 46,750 | -7,299 |
| August 31 | 10,005.30 | 34,821 | -11,929 |
| September 30 | 10,001.50 | 32,016 | -2,805 |
| October 31 | 9,996.92 | 28,820 | -3,196 |
| November 30 | 9,997.32 | 29,094 | +274 |
| December 31, 2009 | 9,968.78 | 29,518 | +424 |
| Calendar year 2009 | - | - | +12,290 |

Trujillo Meadows Reservoir. – In sec. 5, T. 32 N., R. 5 E., on Los Pinos River. Completed in 1957; capacity, 869 acre-ft, effective Jan. 1, 1999. Water is used for fish culture. Storage is transmountain water, by exchange, in 1959.

Month-end gage height, in feet, and contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gage height | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 23.3 | 23.1 | 22.7 | 22.7 | 22.7 | 22.6 | 22.6 | - |
| Contents | 738 | 738 | 738 | 738 | 783 | 770 | 744 | 744 | 744 | 744 | 770 | 738 | - |
| Change | 0 | 0 | 0 | 0 | +45 | -13 | -26 | 0 | 0 | 0 | -6 | 0 | 0 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (constructed or enlarged since 1929)

Heron Reservoir. – Water-stage recorder with satellite telemetry, lat 36°39'56", long 106°42'13", on Willow Creek. Storage began in October 1970. Capacity, 401,300 acre-ft at elevation 7,186.1 ft (low point on crest of spillway); dead storage, 1,340 acre-ft at elevation 7,003.0 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Used for storage of transmountain water.

Month-end elevation, in feet, and contents, in acre-feet

| Date | Elevation | Contents | Change in contents |
|---|---|---|---|
| December 31, 2008 | 7,155.52 | 243,441 | - |
| January 31, 2009 | 7,155.59 | 243,750 | +309 |
| February 28 | 7,155.73 | 244,375 | +625 |
| March 31 | 7,156.97 | 249,939 | +5,564 |
| April 30 | 7,160.64 | 266,828 | +16,889 |
| May 31 | 7,171.08 | 318,216 | +51,389 |
| June 30 | 7,175.38 | 340,868 | +22,652 |
| July 31 | 7,175.45 | 341,248 | +380 |
| August 31 | 7,171.38 | 319,764 | -21,484 |
| September 30 | 7,162.40 | 275,145 | -44,620 |
| October 31 | 7,162.26 | 274,477 | -668 |
| November 30 | 7,159.79 | 262,859 | -11,618 |
| December 31, 2009 | 7,157.45 | 252,110 | -10,749 |
| Calendar year 2009 | - | - | +8,669 |

El Vado Reservoir. – Water-stage recorder and surface follower, lat 36°35'39", long 106°44'00", on Rio Chama. Storage began in January 1935. Capacity, 186,250 acre-ft at gage height 6,902.0 ft (crest of spillway); dead storage, 480 acre-ft, below gage height 6,775.0 ft (invert of outlet works), as determined by survey in 1984. Datum of gage is 8.21 ft above National Geodetic Vertical Datum of 1929. Storage includes both Rio Grande and transmountain water.

Month-end gage height, in feet, and contents, in acre-feet

| Date | Gage Height | Contents | Change in contents | Transmountain water |
|---|---|---|---|---|
| December 31, 2008 | 6,893.42 | 159,619 | - | 42,722 |
| January 31, 2009 | 6,892.30 | 160,818 | +1,200 | 39,645 |
| February 28 | 6,892.73 | 162,108 | +1,290 | 39,614 |
| March 31 | 6,892.13 | 160,310 | -1,798 | 39,524 |
| April 30 | 6,895.28 | 169,837 | +9528 | 32,329 |
| May 31 | 6,898.47 | 179,674 | +9,836 | 32,226 |
| June 30 | 6,898.87 | 180,919 | +1,246 | 27,030 |
| July 31 | 6,889.40 | 152,259 | -28,661 | 19,254 |
| August 31 | 6,877.03 | 119,106 | -33,152 | 29,757 |
| September 30 | 6,881.04 | 129,249 | -10,143 | 63,608 |
| October 31 | 6,873.22 | 110,049 | -19,200 | 54,121 |
| November 30 | 6,875.32 | 114,962 | +4,912 | 59,066 |
| December 31, 2009 | 6,876.05 | 116,717 | +1,755 | 60,801 |
| Calendar year 2009 | - | - | -42,902 | - |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (constructed or enlarged since 1929)

Abiquiu Reservoir. -- Water-stage recorder, lat 36°14'24", long l06°25'44", on Rio Chama. Completed in February 1963; capacity, 1,192,800 acre-ft at elevation 6,350 feet (crest of spillway) by 1998 survey. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Reservoir is operated by Corps of Engineers for flood control and sediment storage. A resolution granting permission to store transmountain waters was approved by Rio Grande Compact Commission on May 3, 1974. Storage includes both Rio Grande and transmountain water.

Month-end elevation, in feet, and contents, in acre-feet

| Date | Elevation | Contents | Change in contents | Transmountain water |
|---|---|---|---|---|
| December 31, 2008 | 6,220.16 | 184,529 | - | 181,786 |
| January 31, 2009 | 6,220.02 | 183,962 | -567 | 179,809 |
| February 28 | 6,219.48 | 181,795 | -2,167 | 178,777 |
| March 31 | 6,219.29 | 181,037 | -758 | 177,538 |
| April 30 | 6,218.90 | 179,486 | -1,552 | 175,639 |
| May 31 | 6,226.72 | 212,118 | +32,632 | 173,941 |
| June 30 | 6,218.68 | 178,617 | -33,501 | 175,586 |
| July 31 | 6,218.47 | 177,787 | -830 | 174,723 |
| August 31 | 6,219.21 | 180,718 | +2,931 | 177,588 |
| September 30 | 6,219.44 | 181,635 | +917 | 178,479 |
| October 31 | 6,219.65 | 182,475 | +840 | 179,320 |
| November 30 | 6,219.50 | 181,875 | -600 | 178,712 |
| December 31, 2009 | 6,219.94 | 183,640 | +1,765 | 180,509 |
| Calendar year 2009 | - | - | -889 | - |

Nambe Falls Reservoir. – Water-stage recorder, lat 35°50'46", long 105°54'17", in NE1/4SW1/4 sec. 29, T. 19 N., R. 10 E., in Nambe Indian Reservation, on Rio Nambe. Completed in 1976; capacity 1,920 acre-ft at elevation 6,826.6 feet (crest of spillway) by 2004 survey, dead storage 121 acre-ft at elevation 6,760.9 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Storage is transmountain water by exchange (see resolution adopted March 27, 1975).

Month-end elevation, in feet, and contents, in acre-feet

| Date | Elevation | Contents | Change in contents |
|---|---|---|---|
| December 31, 2008 | 6,822.75 | 1,707 | - |
| January 31, 2009 | 6,825.21 | 1,840 | +134 |
| February 28 | 6,826.12 | 1,892 | +52 |
| March 31 | 6,826.20 | 1,897 | +5 |
| April 30 | 6,826.70 | 1,925 | +29 |
| May 31 | 6,826.76 | 1,929 | +3 |
| June 30 | 6,826.70 | 1,925 | -3 |
| July 31 | 6,818.98 | 1,515 | -411 |
| August 31 | 6,810.60 | 1,140 | -375 |
| September 30 | 6,808.24 | 1,047 | -93 |
| October 31 | 6,810.62 | 1,140 | +93 |
| November 30 | 6,815.41 | 1,346 | +206 |
| December 31, 2009 | 6,819.20 | 1,525 | +179 |
| Calendar year 2009 | - | - | -181 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (constructed or enlarged since 1929)

McClure (Granite Point) Reservoir. – Water-stage recorder, lat 35°41'18", long l05°50'06", in NE1/4SW1/4 sec. 24, T. 17 N., R. 10 E., on Santa Fe River. Original reservoir completed in 1926, capacity, 561 acre-ft; in 1935, permanent flash boards were installed in spillway increasing capacity to 650 acre-ft; in 1947 both dam and spillway were reconstructed increasing capacity to 2,615 acre-ft (gage height, 96.6 ft, crest of spillway). In 1953 spillway was equipped with radial gates that opened automatically, increasing capacity to over 3,000 acre-ft. In 1972, radial gates were removed decreasing capacity to 2,615 acre-ft. In 1989, modifications to the dam and spillway increased capacity to 2,813 acre-ft. In 1995, modification to the dam and spillway increased capacity to 3,257 acre-ft. No dead storage. Elevation of gage is 7,790 ft above National Geodetic Vertical Datum of 1929, from topographic map. Water is for municipal use in Santa Fe. Storage includes both Rio Grande water and transmountain water by exchange. Capacity includes 561 acre-ft for pre-Compact storage and additional capacity as may be available to accomodate up to a total of 1,061 acre-feet of pre-Compact storage in McClure and Nichols Reservoirs combined.

Month-end gage height, in feet, and contents, in acre-feet

| Date | Gage height | Contents | Change in contents | Pre-Compact water | Transmountain water |
|---|---|---|---|---|---|
| December 31, 2008 | 7,875.93 | 2,520 | - | 92 | 1,882 |
| January 31, 2009 | 7,875.51 | 2,490 | -30 | 173 | 1,882 |
| February 28 | 7,873.80 | 2,370 | -120 | 179 | 1,882 |
| March 31 | 7,874.96 | 2,450 | +80 | 254 | 1,882 |
| April 30 | 7,880.55 | 2,860 | +410 | 624 | 1,882 |
| May 31 | 7,885.64 | 3,250 | +390 | 752 | 1,882 |
| June 30 | 7,885.50 | 3,230 | -20 | 842 | 1,882 |
| July 31 | 7,878.14 | 2,680 | -550 | 713 | 1,882 |
| August 31 | 7,870.52 | 2,150 | -530 | 368 | 1,882 |
| September 30 | 7,864.55 | 1,770 | -380 | 0 | 1,770 |
| October 31 | 7,860.89 | 1,560 | -210 | 0 | 1,560 |
| November 30 | 7,860.78 | 1,550 | -10 | 0 | 1,550 |
| December 31, 2009 | 7,860.64 | 1,540 | -10 | 0 | 1,540 |
| Calendar year 2009 | - | | -980 | | |

Nichols Reservoir. – Water-stage recorder, lat 35°41'24", long l05°52'46", in SE1/4NE1/4 sec. 21, T. 17 N., R. 10 E., on Santa Fe River. Completed in 1942; capacity, 685 acre-ft at gage height 167.0 feet (crest of spillway), dead storage, 14 acre-ft at gage height 121.1 feet. Datum of gage is 7,313.2 feet above National Geodetic Vertical Datum of 1929. Water is for municipal use in Santa Fe. Storage includes both Rio Grande water and transmountain water by exchange. Capacity may include pre-Compact storage such that total pre-Compact storage in McClure and Nichols Reservoirs combined does not exceed 1,061 acre-ft.

Month-end gage height, in feet, and contents, in acre-feet

| Date | Gage height | Contents | Change in contents | Pre-Compact water | Transmountain water |
|---|---|---|---|---|---|
| December 31, 2008 | 149.68 | 274 | - | 26 | 100 |
| January 31, 2009 | 153.78 | 352 | +78 | 72 | 100 |
| February 28 | 159.72 | 485 | +133 | 143 | 100 |
| March 31 | 155.86 | 395 | -90 | 133 | 100 |
| April 30 | 152.52 | 327 | -68 | 146 | 100 |
| May 31 | 166.23 | 662 | +335 | 309 | 100 |
| June 30 | 158.24 | 450 | -212 | 219 | 100 |
| July 31 | 159.92 | 489 | +39 | 348 | 100 |
| August 31 | 156.66 | 414 | -75 | 314 | 100 |
| September 30 | 153.20 | 340 | -74 | 128 | 212 |
| October 31 | 160.01 | 491 | +151 | 69 | 422 |
| November 30 | 157.1 | 423 | -68 | 0 | 423 |
| December 31, 2009 | 152.80 | 332 | -91 | 0 | 332 |
| Calendar year 2009 | - | | +58 | | |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (constructed or enlarged since 1929)

Cochiti Lake. – Water-stage recorder with satellite telemetry, lat 35°37'01", long l06°18'58", in NW1/4SW1/4 sec. 16, T. 16 N., R. 6 E., in Pueblo de Cochiti Grant, on Rio Grande. Completed in l975; capacity 491,259 acre-ft at elevation 5,450.0 ft (crest of service spillway); zero storage at elevation 5,255.0 from 1998 survey. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by the U.S. Army Corps of Engineers). A 50,000 acre-foot permanent pool was authorized by Public Law 88-293, 88th Congress, March 26, 1964. Reservoir is operated by Corps of Engineers for flood control, sediment storage, and recreation. Storage began Nov. 12, 1973.

Month-end elevation, in feet, and contents, in acre-feet

| Date | Elevation | Contents | Change in contents | Transmountain water |
|---|---|---|---|---|
| December 31, 2008 | 6,822.75 | 1,707 | - | 46,527 |
| January 31, 2009 | 6,825.21 | 1,840 | +134 | 46,457 |
| February 28 | 6,826.12 | 1,892 | +52 | 46,266 |
| March 31 | 6,826.20 | 1,897 | +5 | 45,959 |
| April 30 | 6,826.70 | 1,925 | +29 | 45,480 |
| May 31 | 6,826.76 | 1,929 | +3 | 44,888 |
| June 30 | 6,826.70 | 1,925 | -3 | 46,043 |
| July 31 | 6,818.98 | 1,515 | -411 | 47,965 |
| August 31 | 6,810.60 | 1,140 | -375 | 47,313 |
| September 30 | 6,808.24 | 1,047 | -93 | 47,458 |
| October 31 | 6,810.62 | 1,140 | "+93 | 48,124 |
| November 30 | 6,815.41 | 1,346 | +206 | 47,909 |
| December 31, 2009 | 6,819.20 | 1,525 | +179 | 47,861 |
| Calendar year 2009 | - | - | -181 | - |

Galisteo Reservoir. – Water-stage recorder above elevation 5,500.3 ft, nonrecording below, lat 35°27'44", long 106°12'30", in NW1/4 sec. 9, T. 14 N., R. 7 E., on Galisteo Creek. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Storage records begin in October 1970. Capacity 88,990 acre-ft at elevation 5,608.0 ft (crest of spillway). No dead storage. Reservoir is operated by Corps of Engineers for flood control and sediment storage.

Month-end contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contents | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| Change | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (constructed or enlarged since 1929)

Jemez Canyon Reservoir. – Water-stage recorder, lat 35°23'40", long l06°32'50", in SW1/4SW1/4 sec. 32, T. 14 N., R. 4 E., on Jemez River. Completed in 1953; capacity, 259,423 acre-ft at elevation 5,271.20 ft. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Maximum controlled capacity at elevation 5,232.0 ft (floor of spillway) is 97,425 acre-ft by 1998 survey. Reservoir is operated by Corps of Engineers for flood control and sediment storage. A sediment pool of about 2,000 acre-ft of transmountain water has been maintained since August l979.

Month-end elevation, in feet, and contents, in acre-feet

| Date | Elevation | Contents | Change in contents | Transmountain water |
|---|---|---|---|---|
| December 31, 2008 | 5,155.00 | 0 | - | 0 |
| January 31, 2009 | 5,155.00 | 0 | 0 | 0 |
| February 28 | 5,155.00 | 0 | 0 | 0 |
| March 31 | 5,155.00 | 0 | 0 | 0 |
| April 30 | 5,155.00 | 0 | 0 | 0 |
| May 31 | 5,155.00 | 0 | 0 | 0 |
| June 30 | 5,155.00 | 0 | 0 | 0 |
| July 31 | 5,155.00 | 0 | 0 | 0 |
| August 31 | 5,155.00 | 0 | 0 | 0 |
| September 30 | 5,155.00 | 0 | 0 | 0 |
| October 31 | 5,155.00 | 0 | 0 | 0 |
| November 30 | 5,155.00 | 0 | 0 | 0 |
| December 31, 2009 | 5,155.00 | 0 | 0 | 0 |
| Calendar year 2009 | - | - | 0 | - |

Acomita Reservoir. – Staff gage in SE1/4 sec. 29, T. 10 N., R. 7 W., on San Fidel Arroyo; water for reservoir is diverted from Rio San Jose. Completed in 1938; original capacity, 850 acre-ft; present capacity 650 acre-ft on basis of 1956 sediment survey. Water is used for irrigation on Acoma Indian Reservation. Storage omitted from accounting by action of Commission on March 23, 2000.

Month-end contents, in acre-feet

Calendar Year 2009

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Cal. Yr. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contents | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Change | - | - | - | - | - | - | - | - | - | - | - | - | - |

Seama Reservoir. – In sec. 36, T. 10 N., R. 7 W., off channel from Rio San Jose. Completed in October 1980; capacity approximately 400 acre-ft. Water is used for irrigation on Laguna Indian Reservation.

No storage during 2009.

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (project storage)

Elephant Butte Reservoir. – Water-stage recorder, lat 33°09'15", long l07°11'28", in NW1/4 sec. 30, T. 13 S., R. 3 W., on Rio Grande. Storage began Jan. 6, 1915; capacity, 2,023,400 acre-ft at gage height 4,407.0 ft (crest of spillway), by survey of 1999 with flood control storage reservation of 50,000 acre-ft from April through September and 25,000 acre-ft from October through March in accordance with Sept. 9, 1998 resolution of the Rio Grande Compact Commission. Datum of gage is 43.3 ft above National Geodetic Vertical Datum of 1929. Water is used for power development and irrigation in New Mexico and Texas. Records furnished by Bureau of Reclamation. Delivery of transmountain water for minimum recreation pool was initiated in December 1975. Beginning Jan. 1, 1977 gage readings are midnight readings.

Month-end gage height, in feet, and contents, in acre-feet

| Date | Gage Height | Contents | Change in contents | Transmountain water |
|---|---|---|---|---|
| December 31, 2008 | 4,350.34 | 648,788 | - | 31,939 |
| January 31, 2009 | 4,353.33 | 682,065 | +33,227 | 35,224 |
| February 28 | 4,353.26 | 680,948 | -1,117 | 34,953 |
| March 31 | 4,349.41 | 622,045 | -58,903 | 34,585 |
| April 30 | 4,346.54 | 580,391 | -41,654 | 37,972 |
| May 31 | 4,352.30 | 665,854 | +85,463 | 39,553 |
| June 30 | 4,350.24 | 634,391 | -31,463 | 38,139 |
| July 31 | 4,344.26 | 548,412 | -85,979 | 37,766 |
| August 31 | 4,338.04 | 466,260 | -82,152 | 37,299 |
| September 30 | 4,336.59 | 448,244 | -18,016 | 36,834 |
| October 31 | 4,337.10 | 454,532 | +6,288 | 36,538 |
| November 30 | 4,339.42 | 483,820 | +29,288 | 40,548 |
| December 31, 2009 | 4,342.15 | 519,705 | +35,885 | 45,011 |
| Calendar year 2009 | - | - | -129,083 | - |

Caballo Reservoir. – Water-stage recorder, lat 32°53'47", long l07°17'30", in SE1/4SW1/4 sec. 19, T. 16 S., R. 4 W., on Rio Grande. Storage began Feb. 8, 1938; capacity, 326,700 acre-ft (by 1999 resurvey), at gage height 4,182.0 ft (above which spillway gates open automatically). Datum of gage is 43.3 ft above National Geodetic Vertical Datum of 1929.

Month-end gage height, in feet, and contents, in acre-feet

| Date | Gage height | Contents | Change in contents |
|---|---|---|---|
| December 31, 2008 | 4,137.74 | 23,770 | - |
| January 31, 2009 | 4,138.02 | 23,870 | +100 |
| February 28 | 4,144.72 | 43,550 | +1,960 |
| March 31 | 4,143.59 | 39,640 | -3,910 |
| April 30 | 4,147.18 | 53,000 | +13,360 |
| May 31 | 4,148.65 | 59,320 | +6,320 |
| June 30 | 4,149.79 | 64,580 | +5,260 |
| July 31 | 4,147.93 | 56,160 | -8420 |
| August 31 | 4,141.92 | 34,320 | -21,840 |
| September 30 | 4,141.71 | 33,690 | -630 |
| October 31 | 4,138.64 | 25,380 | -8,310 |
| November 30 | 4,139.42 | 27,350 | +1,970 |
| December 31, 2009 | 4,140.22 | 29,460 | +2,110 |
| Calendar year 2009 | | - | +5,690 |

## STORAGE IN RESERVOIRS

### Reservoirs in Rio Grande Basin in New Mexico
### (project storage)

Project storage. – The combined total storage in Elephant Butte and Caballo Reservoirs.

Month-end contents, in acre-feet

| Date | Contents | Change in contents |
|---|---|---|
| December 31, 2008 | 672,558 | - |
| January 31, 2009 | 705,935 | +33377 |
| February 28 | 724,498 | +18,563 |
| March 31 | 661,685 | -62,813 |
| April 30 | 633,391 | -28,294 |
| May 31 | 725,174 | +91,783 |
| June 30 | 698,971 | -26,203 |
| July 31 | 604,572 | -94,399 |
| August 31 | 500,580 | -103,992 |
| September 30 | 481,934 | -18,646 |
| October 31 | 479,912 | -2,022 |
| November 30 | 511,170 | +31,258 |
| December 31, 2009 | 549,165 | +37,995 |
| Calendar year 2009 | | -124,393 |

NOTE.-- Values of combined contents may not agree with sum of individual values because of rounding.

## TRANSMOUNTAIN DIVERSIONS

Pine River - Weminuche Pass ditch (Fuchs ditch).-- Water-stage recorder and 3-ft Parshall flume in sec. 33, T. 40 N., R. 4 W., at Weminuche Pass in Colorado. Diversion is from North Fork Los Pinos River in San Juan River Basin into Weminuche Creek in Rio Grande Basin. Second enlargement was completed in 1936. Diversion for irrigation is from Rio Grande above the Del Norte gaging station.

Weminuche Pass ditch (Raber-Lohr ditch).-- Water-stage recorder and 4-ft rectangular flume in sec. 33, T. 40 N., R. 4 W., at Weminuche Pass in Colorado. Diversion is from Rincon la Vaca Creek in San Juan River Basin into Weminuche Creek in Rio Grande Basin. Second enlargement was completed in 1936. Diversion for irrigation is from Rio Grande above the Del Norte gaging station.

Williams Creek - Squaw Pass ditch.-- Water-stage recorder and 2-ft Parshall flume in sec. 21, T. 39 N., R. 3 W., at Squaw Pass in Colorado. Diversion is from Williams Creek in San Juan River Basin into Squaw Creek in Rio Grande Basin. Constructed in 1938. Diversion for irrigation is from Rio Grande below Del Norte gaging station.

Tabor ditch.-- Water-stage recorder and 3-ft Parshall flume in sec. 35, T. 43 N., R. 3 W., at Spring Creek Pass in Colorado. Diversion is from Cebolla Creek in Gunnison River Basin into tributary of Clear Creek in Rio Grande Basin. Completed in 1910 or 1911. Diversion for irrigation is from Rio Grande below Del Norte gaging station.

Don La Font No. 1 & 2 ditches (Piedra Pass ditch).-- Water-stage recorder and 2-ft Parshall flume in sec. 4, T. 38 N., R. 1 W., at Piedra Pass in Colorado. Diversion is from tributaries of Piedra River in San Juan River Basin to South River in Rio Grande Basin. Original ditch completed in l938, first enlargement completed in 1940. Water is imported by Colorado Game and Fish Department, beginning in 1959, to offset losses from fish culture reservoirs.

Treasure Pass diversion ditch.-- Water-stage recorder and 2-ft Parshall flume in sec. 31, T. 38 N., R. 2 E., at Wolf Creek Pass in Colorado. Diversion is from Wolf Creek in San Juan River Basin to a tributary of South Fork Rio Grande. Completed in 1923 or 1924. Water is diverted for irrigation from Rio Grande above the Del Norte gaging station, beginning in 1959. Prior to 1959 it was diverted below gaging station.

Azotea tunnel.-- Water-stage recorder and 10-ft Parshall flume, lat 36°51’12", long 106°40’18", at south portal of Azotea tunnel, San Juan-Chama Project. Diversion is from Rio Blanco, Little Navajo River, and Navajo River in Colorado and discharge is into Azotea in New Mexico. Construction completed in 1970.

Imported quantities, in acre-feet, 2009

| Month | Pine River-Weminuche Pass ditch | Weminuche Pass ditch | Williams Creek-Squaw Pass ditch | Tabor ditch | Don La Font ditches | Treasure Pass diversion ditch | Azotea tunnel |
|---|---|---|---|---|---|---|---|
| January | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| February | 0 | 0 | 0 | 0 | 0 | 0 | 272 |
| March | 0 | 0 | 0 | 0 | 0 | 0 | 5,938 |
| April | 0 | 0 | 0 | 0 | 0 | 0 | 19,111 |
| May | 0 | 69 | 25 | 419 | 0 | 104 | 51,766 |
| June | 154 | 736 | 158 | 193 | 154 | 143 | 23,544 |
| July | 4 | 42 | 48 | 111 | 0 | 15 | 4,392 |
| August | 0 | 0 | 14 | 46 | 0 | 0 | 232 |
| September | 0 | 0 | 12 | 37 | 6 | 0 | 99 |
| October | 0 | 0 | 0 | 21 | 0 | 0 | 0 |
| November | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| December | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Calendar year | 154 | 847 | 257 | 827 | 160 | 262 | 105,354 |

# EVAPORATION AND PRECIPITATION

The last paragraph of Article VI of the Compact states, in part, --- "such credits and debits shall be reduced annually to compensate for evaporation losses in the proportion that such credits or debits bear to the total amount of water in such reservoirs during the year."

To provide the data needed for the computation of such evaporation losses, the Commission has encouraged the establishment and operation of evaporation stations near each major reservoir in the basin and at other selected locations.

Evaporation and other climatological data collected at the several stations in Colorado and New Mexico are tabulated on the next page. At some of the stations, it was not possible to obtain evaporation records throughout the winter period.

The measurements of evaporation were made in accordance with standard practice for the type of pan in use. Measurements of precipitation were made in standard 8-inch rain gages, which were supplemented at some of the stations by recording rain gages.

Records for the evaporation stations at the State University, Elephant Butte Dam, and El Vado Dam antedated the creation of the Commission; the stations at Abiquiu Dam, Cochiti Dam, and Jemez Canyon Dam were established by the Corps of Engineers. All others were established at the request of the Commission.

The Rio Grande Compact Commission gratefully acknowledges the cooperation of the National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation for furnishing the climatological records contained in this report.

Alamosa Airport.--Lat 37°27', long 105°52', in Alamosa County at airport near Alamosa, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 7,536 ft.

Platoro Dam.--Lat 37°21', long 106°30', in Conejos County near Platoro, Colo. Standard class A pan, anemometer, maximum and minimum thermometers, fan type psychrometer, standard 8-inch and recording rain gages at elevation 9,826 ft.

Heron Dam.--Lat 36°40', long 106°42', in Rio Arriba County about 4 mi. northeast of Heron Dam near Tierra Amarilla, N. Mex Standard class A pan, maximum and minimum thermometers, and standard 8-inch rain gage at elevation 7,310 ft.

El Vado Dam.--Lat 36°36', long 106°44', in Rio Arriba County at El Vado Dam near Tierra Amarilla, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 6,750 ft.

Abiquiu Dam.--Lat 36°14', long 106°26', in Rio Arriba County at Abiquiu Dam near Abiquiu, N. Mex. Standard class A pan, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 6,380 ft.

Nambe Falls Dam.--Lat 35°51', long 105°54', in Santa Fe County at Nambe Falls Dam, N. Mex. Standard class A pan, maximum and minimum thermometers, recording thermograph, standard 8-inch and recording rain gages at elevation 6,840 ft.

Cochiti Dam.--Lat 35°38', long 106°19', in Sandoval County at operations building, at Cochiti Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 5,560 ft.

Jemez Canyon Dam.--Lat 35°23', long 106°32', in Sandoval County at Jemez Canyon Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 5,388 ft.

Elephant Butte Dam.--Lat 33°09', long 107°11', in Sierra County at Elephant Butte Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, and standard 8-inch rain gage at elevation 4,576 ft.

Caballo Dam.--Lat 32°54', long 107°18', in Sierra County at Caballo Dam, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 4,190 ft.

New Mexico State University.--Lat 32°17', long 106°45', in Doña Ana County at University Park, N. Mex. Standard class A pan, anemometer, maximum and minimum thermometers, standard 8-inch and recording rain gages at elevation 3,881 ft.

# EVAPORATION AND PRECIPITATION

## Evaporation and precipitation, in inches
## 2009

| Station | | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug | Sept. | Oct. | Nov. | Dec. | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alamosa | Evap. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Airport | Precip. | 0.10 | 0.02 | 0.53 | 1.12 | 1.17 | 0.59 | 0.45 | 0.71 | 1.01 | 1.33 | 0.11 | 0.10 | 7.24 |
| Platoro | Evap. | - | - | - | - | 1.86 | 3.28 | 1.32 | 1.34 | 2.94 | 2.55 | - | - | - |
| Dam | Precip. | - | - | - | - | 3.31 | 7.59 | 8.43 | 6.74 | 3.37 | 1.88 | - | - | - |
| Heron | Evap. | - | - | - | 5.31 | 7.14 | 6.84 | 8.97 | 8.45 | 5.67 | 4.36 | - | - | - |
| Dam | Precip. | 1.10 | 0.39 | 0.59 | 2.47 | 0.86 | 2.03 | 1.91 | 0.81 | 2.34 | 1.76 | 0.11 | 1.49 | 15.86 |
| El Vado | Evap. | - | - | - | 5.94 | 7.97 | 7.07 | 8.80 | 8.37 | 5.06 | 4.17 | - | - | - |
| Dam | Precip. | 0.93 | 0.20 | 0.44 | 1.11 | 0.72 | 2.28 | 2.22 | 0.69 | 0.92 | 2.15 | 0.05 | 1.58 | 13.29 |
| Abiquiu | Evap. | - | - | - | 7.41 | 9.82 | 8.88 | 10.59 | 9.70 | 6.77 | 5.91 | - | - | - |
| Dam | Precip. | 0.35 | 0.04 | 0.51 | 0.78 | 1.29 | 2.67 | 3.16 | 1.14 | 0.87 | 1.23 | 0.25 | 0.57 | 12.86 |
| Nambe | Evap. | - | - | - | 6.52 | 8.78 | 8.48 | 10.11 | 10.06 | 6.47 | 4.87 | - | - | - |
| Canyon Dam | Precip. | 0.20 | 0.34 | 0.52 | 0.00 | 0.65 | 2.09 | 2.38 | 1.09 | 1.34 | 2.42 | 0.30 | 0.74 | 12.07 |
| Cochiti | Evap. | - | - | 9.31 | - | 12.16 | 9.45 | 11.51 | 11.13 | 8.65 | 6.60 | - | - | - |
| Dam | Precip. | 0.09 | 0.00 | 0.33 | 0.74 | 1.14 | 1.49 | 2.25 | 0.94 | 1.97 | 1.68 | 0.36 | 0.64 | 11.63 |
| Jemez | Evap. | - | - | - | 9.53 | 12.62 | 14.33 | 13.68 | 11.84 | 9.66 | 6.02 | - | - | - |
| Canyon Dam | Precip. | 0.00 | 0.00 | 0.47 | 0.97 | 0.72 | 1.55 | 1.26 | 0.55 | 1.74 | 0.81 | 0.22 | 0.38 | 8.67 |
| Elephant | Evap. | 4.71 | 7.04 | 10.73 | 14.47 | 15.63 | 16.01 | 16.89 | 13.74 | 9.78 | 9.10 | 5.08 | 2.55 | 125.73 |
| Butte Dam | Precip. | 0.02 | 0.00 | 0.17 | 0.00 | 1.10 | 0.66 | 3.02 | 0.24 | 1.74 | 0.94 | 0.50 | 0.21 | 8.60 |
| Caballo | Evap. | 4.84 | 6.69 | 9.88 | 12.26 | 13.09 | 13.38 | 13.88 | 12.86 | 8.78 | 8.37 | 4.88 | - | - |
| Dam | Precip. | 0.00 | 0.00 | 0.14 | 0.05 | 0.24 | 1.06 | 0.58 | 2.96 | 1.66 | 0.21 | 0.66 | 0.89 | 8.45 |
| State | Evap. | - | 5.50 | 8.63 | 11.08 | 11.80 | 12.56 | 12.84 | 10.92 | 7.92 | - | 4.10 | 2.30 | - |
| University | Precip. | 0.00 | 0.00 | 0.03 | 0.02 | 0.64 | 0.14 | 1.78 | 0.99 | 1.93 | - | 1.19 | 1.39 | - |

# RIO GRANDE COMPACT

The State of Colorado, the State of New Mexico, and the State of Texas, desiring to remove all causes of present and future controversy among these States and between citizens of one of these States and citizens of another State with respect to the use of the waters of the Rio Grande above Fort Quitman, Texas, and being moved by considerations of interstate comity, and for the purpose of effecting an equitable apportionment of such waters, have resolved to conclude a Compact for the attainment of these purposes, and to that end, through their respective Governors, have named as their respective Commissioners:

| | |
|---|---|
| For the State of Colorado | M. C. Hinderlider |
| For the State of New Mexico | Thomas M. McClure |
| For the State of Texas | Frank B. Clayton |

who, after negotiations participated in by S. O. Harper, appointed by the President as the representative of the United States of America, have agreed upon the following articles, to- wit:

## ARTICLE I

(a) The State of Colorado, the State of New Mexico, the State of Texas, and the United States of America, are hereinafter designated “Colorado,” “New Mexico,” “Texas,” and the “United States,” respectively.

(b) “The Commission” means the agency created by this Compact for the administration thereof.

(c) The term “Rio Grande Basin” means all of the territory drained by the Rio Grande and its tributaries in Colorado, in New Mexico, and in Texas above Fort Quitman, including the Closed Basin in Colorado.

(d) The “Closed Basin” means that part of the Rio Grande Basin in Colorado where the streams drain into the San Luis Lakes and adjacent territory, and do not normally contribute to the flow of the Rio Grande.

(e) The term “tributary” means any stream which naturally contributes to the flow of the Rio Grande.

(f) “Transmountain Diversion” is water imported into the drainage basin of the Rio Grande from any stream system outside of the Rio Grande Basin, exclusive of the Closed Basin.

(g) “Annual Debits” are the amounts by which actual deliveries in any calendar year fall below scheduled deliveries.

(h) “Annual Credits” are the amounts by which actual deliveries in any calendar year exceed scheduled deliveries.

(i) “Accrued Debits” are the amounts by which the sum of all annual debits exceeds the sum of all annual credits over any common period of time.

(j) “Accrued Credits” are the amounts by which the sum of all annual credits exceeds the sum of all annual debits over any common period of time.

(k) “Project Storage” is the combined capacity of Elephant Butte Reservoir and all other reservoirs actually available for the storage of usable water below Elephant Butte and above the first diversion to lands of the Rio Grande Project, but not more than a total of 2,638,860 acre feet.

RIO GRANDE COMPACT

(l) “Usable Water” is all water, exclusive of credit water, which is in project storage and which is available for release in accordance with irrigation demands, including deliveries to Mexico.

(m) “Credit Water” is that amount of water in project storage which is equal to the accrued credit of Colorado, or New Mexico, or both.

(n) “Unfilled Capacity” is the difference between the total physical capacity of project storage and the amount of usable water then in storage.

(o) “Actual Release” is the amount of usable water released in any calendar year from the lowest reservoir comprising project storage.

(p) “Actual Spill” is all water which is actually spilled from Elephant Butte Reservoir, or is released therefrom for flood control, in excess of the current demand on project storage and which does not become usable water by storage in another reservoir; provided, that actual spill of usable water cannot occur until all credit water shall have been spilled.

(q)”Hypothetical Spill” is the time in any year at which usable water would have spilled from project storage if 790,000 acre feet had been released therefrom at rates proportional to the actual release in every year from the starting date to the end of the year in which hypothetical spill occurs; in computing hypothetical spill the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following the effective date of this Compact, and thereafter the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following each actual spill.

ARTICLE II

The Commission shall cause to be maintained and operated a stream gaging station equipped with an automatic water stage recorder at each of the following points, to-wit:

(a) On the Rio Grande near Del Norte above the principal points of diversion to the San Luis Valley;

(b) On the Conejos River near Mogote;

(c) On the Los Pinos River near Ortiz;

(d) On the San Antonio River at Ortiz;

(e) On the Conejos River at its mouths near Los Sauces;

(f) On the Rio Grande near Lobatos;

(g) On the Rio Chama below El Vado Reservoir;

(h) On the Rio Grande at Otowi Bridge near San Ildefonso;

(i) On the Rio Grande near San Acacia;

(j) On the Rio Grande at San Marcial;

(k) On the Rio Grande below Elephant Butte Reservoir;

(l) On the Rio Grande below Caballo Reservoir.

Similar gaging stations shall be maintained and operated below any other reservoir constructed after 1929, and at such other points as may be necessary for the securing of records required for the carrying out of the Compact; and automatic water stage recorders shall be maintained and operated on each of the reservoirs mentioned, and on all others constructed after 1929.

RIO GRANDE COMPACT

Such gaging stations shall be equipped, maintained and operated by the Commission directly or in cooperation with an appropriate Federal or State agency, and the equipment, method and frequency of measurement at such stations shall be such as to produce reliable records at all times. (Note: See Resolution of Commission printed elsewhere in this report.)

ARTICLE III

The obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico State Line, measured at or near Lobatos, in each calendar year, shall be ten thousand acre feet less than the sum of those quantities set forth in the two following tabulations of relationship, which correspond to the quantities at the upper index stations:

DISCHARGE OF CONEJOS RIVER

Quantities in thousands of acre feet

| Conejos Index Supply (1) | Conejos River at Mouths (2) |
|---|---|
| 100 | 0 |
| 150 | 20 |
| 200 | 45 |
| 250 | 75 |
| 300 | 109 |
| 350 | 147 |
| 400 | 188 |
| 450 | 232 |
| 500 | 278 |
| 550 | 326 |
| 600 | 376 |
| 650 | 426 |
| 700 | 476 |

Intermediate quantities shall be computed by proportional parts.

(1) Conejos Index Supply is the natural flow of Conejos River at the U.S.G.S. gaging station near Mogote during the calendar year, plus the natural flow of Los Pinos River at the U.S.G.S. gaging station near Ortiz and the natural flow of San Antonio River at the U.S.G.S. gaging station at Ortiz, both during the months of April to October, inclusive.

(2) Conejos River at Mouths is the combined discharge of branches of this river at the U.S.G.S. gaging stations near Los Sauces during the calendar year.

DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER

Quantities in thousands of acre feet

| Rio Grande at Del Norte (3) | Rio Grande at Lobatos less Conejos at Mouths (4) |
|---|---|
| 200 | 60 |
| 250 | 65 |
| 300 | 75 |
| 350 | 86 |
| 400 | 98 |
| 450 | 112 |
| 500 | 127 |
| 550 | 144 |
| 600 | 162 |

RIO GRANDE COMPACT

DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER--Con.

Quantities in thousands of acre feet

| Rio Grande at Del Norte (3) | Rio Grande at Lobatos less Conejos at Mouths (4) |
|---|---|
| 650 | 182 |
| 700 | 204 |
| 750 | 229 |
| 800 | 257 |
| 850 | 292 |
| 900 | 335 |
| 950 | 380 |
| 1,000 | 430 |
| 1,100 | 540 |
| 1,200 | 640 |
| 1,300 | 740 |
| 1,400 | 840 |

Intermediate quantities shall be computed by proportional parts.

(3) Rio Grande at Del Norte is the recorded flow of the Rio Grande at the U.S.G.S. gaging station near Del Norte during the calendar year (measured above all principal points of diversion to San Luis Valley) corrected for the operation of reservoirs constructed after 1937.

(4) Rio Grande at Lobatos less Conejos at Mouths is the total flow of the Rio Grande at the U.S.G.S. gaging station near Lobatos, less the discharge of Conejos River at its Mouths, during the calendar year.

The application of these schedules shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) any new or increased depletion of the runoff above inflow index gaging stations; and (c) any transmountain diversions into the drainage basin of the Rio Grande above Lobatos.

In event any works are constructed after 1937 for the purpose of delivering water into the Rio Grande from the Closed Basin, Colorado shall not be credited with the amount of such water delivered, unless the proportion of sodium ions shall be less than forty-five percent of the total positive ions in that water when the total dissolved solids in such water exceeds three hundred fifty parts per million.

ARTICLE IV

The obligation of New Mexico to deliver water in the Rio Grande at San Marcial, during each calendar year, exclusive of the months of July, August, and September, shall be that quantity set forth in the following tabulation of relationship, which corresponds to the quantity at the upper index station:

RIO GRANDE COMPACT

DISCHARGE OF RIO GRANDE AT OTOWI BRIDGE AND AT SAN MARCIAL
EXCLUSIVE OF JULY, AUGUST AND SEPTEMBER
Quantities in thousands of acre feet

| Otowi Index Supply (5) | San Marcial Index Supply (6) |
|---|---|
| 100 | 0 |
| 200 | 65 |
| 300 | 141 |
| 400 | 219 |
| 500 | 300 |
| 600 | 383 |
| 700 | 469 |
| 800 | 557 |
| 900 | 648 |
| 1,000 | 742 |
| 1,100 | 839 |
| 1,200 | 939 |
| 1,300 | 1,042 |
| 1,400 | 1,148 |
| 1,500 | 1,257 |
| 1,600 | 1,370 |
| 1,700 | 1,489 |
| 1,800 | 1,608 |
| 1,900 | 1,730 |
| 2,000 | 1,856 |
| 2,100 | 1,985 |
| 2,200 | 2,117 |
| 2,300 | 2,253 |

Intermediate quantities shall be computed by proportional parts.

(5) The Otowi Index Supply is the recorded flow of the Rio Grande at the U.S.G.S. gaging station at Otowi Bridge near San Ildefonso (formerly station near Buckman) during the calendar year, exclusive of the flow during the months of July, August and September, corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge.

(6) San Marcial Index Supply is the recorded flow of the Rio Grande at the gaging station at San Marcial during the calendar year exclusive of the flow during the months of July, August and September.

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) depletion after 1929 in New Mexico at any time of the year of the natural runoff at Otowi Bridge; (c) depletion of the runoff during July, August and September of tributaries between Otowi Bridge and San Marcial, by works constructed after 1937; and (d) any transmountain diversions into the Rio Grande between Lobatos and San Marcial.

Concurrent records shall be kept of the flow of the Rio Grande at San Marcial, near San Acacia, and of the release from Elephant Butte Reservoir to the end that the records at these three stations may be correlated. (Note: See Resolution of Commission printed elsewhere in this report.)

## RIO GRANDE COMPACT

### ARTICLE V

If at any time it should be the unanimous finding and determination of the Commission that because of changed physical conditions, or for any other reason, reliable records are not obtainable, or cannot be obtained, at any of the stream gaging stations herein referred to, such stations may, with the unanimous approval of the Commission, be abandoned, and with such approval another station, or other stations, shall be established and new measurements shall be substituted which, in the unanimous opinion of the Commission, will result in substantially the same results so far as the rights and obligations to deliver water are concerned, as would have existed if such substitution of stations and measurements had not been so made. (Note: See Resolution of Commission printed elsewhere in this report.)

### ARTICLE VI

Commencing with the year following the effective date of this Compact, all credits and debits of Colorado and New Mexico shall be computed for each calendar year; provided, that in a year of actual spill no annual credits nor annual debits shall be computed for that year.

In the case of Colorado, no annual debit nor accrued debit shall exceed 100,000 acre feet, except as either or both may be caused by holdover storage of water in reservoirs constructed after 1937 in the drainage basin of the Rio Grande above Lobatos. Within the physical limitations of storage capacity in such reservoirs, Colorado shall retain water in storage at all times to the extent of its accrued debit.

In the case of New Mexico, the accrued debit shall not exceed 200,000 acre feet at any time, except as such debit may be caused by holdover storage of water in reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and San Marcial. Within the physical limitations of storage capacity in such reservoirs, New Mexico shall retain water in storage at all times to the extent of its accrued debit. In computing the magnitude of accrued credits or debits, New Mexico shall not be charged with any greater debit in any one year than the sum of 150,000 acre-feet and all gains in the quantity of water in storage in such year.

The Commission by unanimous action may authorize the release from storage of any amount of water which is then being held in storage by reason of accrued debits of Colorado or New Mexico; provided, that such water shall be replaced at the first opportunity thereafter.

In computing the amount of accrued credits and accrued debits of Colorado or New Mexico, any annual credits in excess of 150,000 acre feet shall be taken as equal to that amount.

In any year in which actual spill occurs, the accrued credits of Colorado, or New Mexico, or both, at the beginning of the year shall be reduced in proportion to their respective credits by the amount of such actual spill; provided that the amount of actual spill shall be deemed to be increased by the aggregate gain in the amount of water in storage, prior to the time of spill, in reservoirs above San Marcial constructed after 1929; provided, further, that if the Commissioners for the States having accrued credits authorize the release of part, or all, of such credits in advance of spill, the amount so released shall be deemed to constitute actual spill.

In any year in which there is actual spill of usable water, or at the time of hypothetical spill thereof, all accrued debits of Colorado, or New Mexico, or both, at the beginning of the year shall be cancelled.

RIO GRANDE COMPACT

In any year in which the aggregate of accrued debits of Colorado and New Mexico exceeds the minimum unfilled capacity of project storage, such debits shall be reduced proportionally to an aggregate amount equal to such minimum unfilled capacity.

To the extent that accrued credits are impounded in reservoirs between San Marcial and Courchesne, and to the extent that accrued debits are impounded in reservoirs above San Marcial, such credits and debits shall be reduced annually to compensate for evaporation losses in the proportion that such credits or debits bore to the total amount of water in such reservoirs during the year.

ARTICLE VII

Neither Colorado nor New Mexico shall increase the amount of water in storage in reservoirs constructed after 1929 whenever there is less than 400,000 acre feet of usable water in project storage; provided, that if the actual releases of usable water from the beginning of the calendar year following the effective date of this Compact, or from the beginning of the calendar year following actual spill, have aggregated more than an average of 790,000 acre feet per annum, the time at which such minimum stage is reached shall be adjusted to compensate for the difference between the total actual release and releases at such average rate; provided, further, that Colorado, or New Mexico, or both, may relinquish accrued credits at any time, and Texas may accept such relinquished water, and in such event the state, or states, so relinquishing shall be entitled to store water in the amount of the water so relinquished.

ARTICLE VIII

During the month of January of any year the Commissioner for Texas may demand of Colorado and New Mexico, and the Commissioner for New Mexico may demand of Colorado, the release of water from storage reservoirs constructed after 1929 to the amount of the accrued debits of Colorado and New Mexico, respectively, and such releases shall be made by each at the greatest rate practicable under the conditions then prevailing, and in proportion to the total debit of each, and in amounts, limited by their accrued debits, sufficient to bring the quantity of usable water in project storage to 600,000 acre feet by March first and to maintain this quantity in storage until April thirtieth, to the end that a normal release of 790,000 acre feet may be made from project storage in that year.

ARTICLE IX

Colorado agrees with New Mexico that in event the United States or the State of New Mexico decides to construct the necessary works for diverting the waters of the San Juan River, or any of its tributaries, into the Rio Grande, Colorado hereby consents to the construction of said works and the diversion of waters from the San Juan River, or the tributaries thereof, into the Rio Grande in New Mexico, provided the present and prospective uses of water in Colorado by other diversions from the San Juan River, or its tributaries, are protected.

ARTICLE X

In the event water from another drainage basin shall be imported into the Rio Grande Basin by the United States or Colorado or New Mexico, or any of them jointly, the State having the right to the use of such water shall be given proper credit therefor in the application of the schedules.

ARTICLE XI

New Mexico and Texas agree that upon the effective date of this Compact all controversies between said States relative to the quantity or quality of the water of the Rio Grande are composed and settled; however, nothing herein shall be interpreted to prevent

recourse by a signatory state to the Supreme Court of the United States for redress should the character or quality of the water, at the point of delivery, be changed hereafter by one signatory state to the injury of another. Nothing herein shall be construed as an admission by any signatory state that the use of water for irrigation causes increase of salinity for which the user is responsible in law.

ARTICLE XII

To administer the provisions of this Compact there shall be constituted a Commission composed of one representative from each state, to be known as the Rio Grande Compact Commission. The State Engineer of Colorado shall be ex-officio the Rio Grande Compact Commissioner for Colorado. The State Engineer of New Mexico shall be ex-officio the Rio Grande Compact Commissioner for New Mexico. The Rio Grande Compact Commissioner for Texas shall be appointed by the Governor of Texas. The President of the United States shall be requested to designate a representative of the United States to sit with such Commission, and such representative of the United States, if so designated by the President, shall act as Chairman of the Commission without vote.

The salaries and personal expenses of the Rio Grande Compact Commissioners for the three States shall be paid by their respective States, and all other expenses incident to the administration of this Compact, not borne by the United States, shall be borne equally by the three States.

In addition to the powers and duties hereinbefore specifically conferred upon such Commission, and the members thereof, the jurisdiction of such Commission shall extend only to the collection, correlation and presentation of factual data and the maintenance of records having a bearing upon the administration of this Compact, and, by unanimous action, to the making of recommendations to the respective States upon matters connected with the administration of this Compact. In connection therewith, the Commission may employ such engineering and clerical aid as may be reasonably necessary within the limit of funds provided for that purpose by the respective States. Annual reports compiled for each calendar year shall be made by the Commission and transmitted to the Governors of the signatory States on or before March first following the year covered by the report. The Commission may, by unanimous action, adopt rules and regulations consistent with the provisions of this Compact to govern their proceedings.

The findings of the Commission shall not be conclusive in any court or tribunal which may be called upon to interpret or enforce this Compact.

ARTICLE XIII

At the expiration of every five-year period after the effective date of this Compact, the Commission may, by unanimous consent, review any provisions hereof which are not substantive in character and which do not affect the basic principles upon which the Compact is founded, and shall meet for the consideration of such questions on the request of any member of the Commission; provided, however, that the provisions hereof shall remain in full force and effect until changed and amended within the intent of the Compact by unanimous action of the Commissioners, and until any changes in this Compact are ratified by the legislatures of the respective states and consented to by the Congress, in the same manner as this Compact is required to be ratified to become effective.

ARTICLE XIV

The schedules herein contained and the quantities of water herein allocated shall never be increased nor diminished by reason of any increase or diminution in the delivery or loss of water to Mexico.

## RIO GRANDE COMPACT

### ARTICLE XV

The physical and other conditions characteristic of the Rio Grande and peculiar to the territory drained and served thereby, and to the development thereof, have actuated this Compact and none of the signatory states admits that any provisions herein contained establishes any general principle or precedent applicable to other interstate streams.

### ARTICLE XVI

Nothing in this Compact shall be construed as affecting the obligations of the United States of America to Mexico under existing treaties, or to the Indian Tribes, or as impairing the rights of the Indian Tribes.

### ARTICLE XVII

This Compact shall become effective when ratified by the legislatures of each of the signatory states and consented to by the Congress of the United States. Notice of ratification shall be given by the Governor of each state to the Governors of the other states and to the President of the United States, and the President of the United States is requested to give notice to the Governors of each of the signatory states of the consent of the Congress of the United States.

IN WITNESS WHEREOF, the Commissioners have signed this Compact in quadruplicate original, one of which shall be deposited in the archives of the Department of State of the United States of America and shall be deemed the authoritative original, and of which a duly certified copy shall be forwarded to the Governor of each of the signatory States.

Done at the City of Santa Fe, in the State of New Mexico, on the 18th day of March, in the year of our Lord, One Thousand Nine Hundred and Thirty-eight.

(Sgd.) M. C. HINDERLIDER

(Sgd.) THOMAS M. McCLURE

(Sgd.) FRANK B. CLAYTON

APPROVED:

(Sgd.) S. O. HARPER

RATIFIED BY:

Colorado, February 21, 1939
New Mexico, March 1, 1939
Texas, March 1, 1939

Passed Congress as Public Act No. 96, 76th Congress,

Approved by the President May 31, 1939

RESOLUTION ADOPTED BY RIO GRANDE COMPACT COMMISSION
AT THE ANNUAL MEETING HELD AT EL PASO, TEXAS, FEBRUARY 22-24, 1948, CHANGING
GAGING STATIONS AND MEASUREMENTS OF
DELIVERIES BY NEW MEXICO

R E S O L U T I O N

Whereas, at the Annual Meeting of the Rio Grande Compact Commission in the year 1945, the question was raised as to whether or not a schedule for delivery of water by New Mexico during the entire year could be worked out, and

Whereas, at said meeting the question was referred to the Engineering Advisers for their study, recommendations and report, and

Whereas, said Engineering Advisers have met, studied the problems and under date of February 24, 1947, did submit their Report, which said Report contains the findings of said Engineering Advisers and their recommendations, and

Whereas, the Compact Commission has examined said Report and finds that the matters and things therein found and recommended are proper and within the terms of the Rio Grande Compact, and

Whereas, the Commission has considered said Engineering Advisers' Report and all available evidence, information and material and is fully advised:

Now, Therefore, Be it Resolved:

The Commission finds as follows:

(a) That because of change of physical conditions, reliable records of the amount of water passing San Marcial are no longer obtainable at the stream gaging station at San Marcial and that the same should be abandoned for Compact purposes.

(b) That the need for concurrent records at San Marcial and San Acacia no longer exists and that the gaging station at San Acacia should be abandoned for Compact purposes.

(c) That it is desirable and necessary that the obligations of New Mexico under the Compact to deliver water in the months of July, August, September, should be scheduled.

(d) That the change in gaging stations and substitution of the new measurements as hereinafter set forth will result in substantially the same results so far as the rights and obligations to deliver water are concerned, and would have existed if such substitution of stations and measurements had not been so made.

Be it Further Resolved:

That the following measurements and schedule thereof shall be substituted for the measurements and schedule thereof as now set forth in Article IV of the Compact:

"The obligation of New Mexico to deliver water in the Rio Grande into Elephant Butte Reservoir during each calendar year shall be measured by that quantity set forth in the following tabulation of relationship which corresponds to the quantity at the upper index station:

RIO GRANDE COMPACT COMMISSION REPORT

DISCHARGE OF RIO GRANDE AT OTOWI BRIDGE AND ELEPHANT BUTTE EFFECTIVE SUPPLY

Quantities in thousands of acre-feet

| Otowi Index Supply (5) | Elephant Butte Effective Index Supply (6) |
|---|---|
| 100 | 57 |
| 200 | 114 |
| 300 | 171 |
| 400 | 228 |
| 500 | 286 |
| 600 | 345 |
| 700 | 406 |
| 800 | 471 |
| 900 | 542 |
| 1,000 | 621 |
| 1,100 | 707 |
| 1,200 | 800 |
| 1,300 | 897 |
| 1,400 | 996 |
| 1,500 | 1,095 |
| 1,600 | 1,195 |
| 1,700 | 1,295 |
| 1,800 | 1,395 |
| 1,900 | 1,495 |
| 2,000 | 1,595 |
| 2,100 | 1,695 |
| 2,200 | 1,795 |
| 2,300 | 1,895 |
| 2,400 | 1,995 |
| 2,500 | 2,095 |
| 2,600 | 2,195 |
| 2,700 | 2,295 |
| 2,800 | 2,395 |
| 2,900 | 2,495 |
| 3,000 | 2,595 |

Intermediate quantities shall be computed by proportional parts.

(5) The Otowi Index Supply is the recorded flow of the Rio Grande at the U.S.G.S. gaging station at Otowi Bridge near San ildefonso (formerly station near Buckman) during the calendar year, corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge.

(6) Elephant Butte Effective Index Supply is the recorded flow of the Rio Grande at the gaging station below Elephant Butte Dam during the calendar year plus the net gain in storage in Elephant Butte Reservoir during the same year or minus the net loss in storage in said reservoir, as the case may be.

RIO GRANDE COMPACT

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gaging stations; (b) depletion after 1929 in New Mexico of the natural runoff at Otowi Bridge; and (c) any transmountain diversions into the Rio Grande between Lobatos and Elephant Butte Reservoir."

Be it Further Resolved:

That the gaging stations at San Acacia and San Marcial be, and the same are hereby abandoned for Compact purposes.

Be it Further Resolved:

That this Resolution has been passed unanimously and shall be effective January 1, 1949, if within 120 days from this date the Commissioner for each State shall have received from the Attorney General of the State represented by him, an opinion approving this Resolution, and shall have so advised the Chairman of the Commission, otherwise, to be of no force and effect.

(Note: The following paragraph appears in the Minutes of the Annual Meeting of the Commission held at Denver, Colorado, February 14-16, 1949.

"The Chairman announced that he had received, pursuant to the Resolution adopted by the Commission at the Ninth Annual Meeting on February 24, 1948, opinions from the Attorneys General of Colorado, New Mexico and Texas that the substitution of stations and measurements of deliveries by New Mexico set forth in said resolution was within the powers of the Commission").

## RULES AND REGULATIONS FOR ADMINISTRATION OF THE RIO GRANDE COMPACT

A Compact, known as the Rio Grande Compact, between the States of Colorado, New Mexico and Texas, having become effective on May 31, 1939 by consent of the Congress of the United States, which equitably apportions the waters of the Rio Grande above Fort Quitman and permits each State to develop its water resources at will, subject only to its obligations to deliver water in accordance with the schedules set forth in the Compact, the following Rules and Regulations have been adopted for its administration by the Rio Grande Compact Commission; to be and remain in force and effect only so long as the same may be satisfactory to each and all members of the Commission, and provided always that on the objection of any member of the Commission, in writing, to the remaining two members of the Commission after a period of sixty days from the date of such objection, the sentence, paragraph or any portion or all of these rules to which any such objection shall be made, shall stand abrogated and shall thereafter have no further force and effect; it being the intent and purpose of the Commission to permit these rules to obtain and be effective only so long as the same may be satisfactory to each and all of the Commissioners.

### GAGING STATIONS /1

Responsibility for the equipping, maintenance and operation of the stream gaging stations and reservoir gaging stations required by the provisions of Article II of the Compact shall be divided among the signatory States as follows:

(a) Gaging stations on streams and reservoirs in the Rio Grande Basin above the Colorado-New Mexico boundary shall be equipped, maintained, and operated by Colorado in cooperation with the U.S. Geological Survey.

(b) Gaging stations on streams and reservoirs in the Rio Grande Basin below Lobatos and above Caballo Reservoir shall be equipped, maintained and operated by New Mexico in cooperation with the U.S. Geological Survey to the extent that such stations are not maintained and operated by some other Federal agency.

(c) Gaging stations on Elephant Butte Reservoir and on Caballo Reservoir, and the stream gaging stations on the Rio Grande below those reservoirs shall be equipped, maintained and operated by or on behalf of Texas through the agency of the U.S. Bureau of Reclamation.

The equipment, method and frequency of measurements at each gaging station shall be sufficient to obtain records at least equal in accuracy to those classified as “good” by the U.S. Geological Survey. Water-stage recorders on the reservoirs specifically named in Article II of the Compact shall have sufficient range below maximum reservoir level to record major fluctuations in storage. Staff gages may be used to determine fluctuations below the range of the water-stage recorders on these and other large reservoirs, and staff gages may be used upon approval of the Commission in lieu of water-stage recorders on small reservoirs, provided that the frequency of observation is sufficient in each case to establish any material changes in water levels in such reservoirs.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.

## RULES AND REGULATIONS

### RESERVOIR CAPACITIES /1

Colorado shall file with the Commission a table of areas and capacities for each reservoir in the Rio Grande Basin above Lobatos constructed after 1937; New Mexico shall file with the Commission a table of areas and capacities for each reservoir in the Rio Grande Basin between Lobatos and San Marcial constructed after 1929; and Texas shall file with the Commission tables of areas and capacities for Elephant Butte Reservoir and for all other reservoirs actually available for the storage of water between Elephant Butte and the first diversion to lands under the Rio Grande Project.

Whenever it shall appear that any table of areas and capacities is in error by more than five per cent, the Commission shall use its best efforts to have a re-survey made and a corrected table of areas and capacities to be substituted as soon as practicable. To the end that the Elephant Butte effective supply may be computed accurately, the Commission shall use its best efforts to have the rate of accumulation and the place of deposition of silt in Elephant Butte Reservoir checked at least every three years.

### ACTUAL SPILL /2, /3, /4

(a) Water released from Elephant Butte in excess of Project requirements, which is currently passed through Caballo Reservoir, prior to the time of spill, shall be deemed to have been Usable Water released in anticipation of spill, or Credit Water if such release shall have been authorized.

(b) Excess releases from Elephant Butte Reservoir, as defined in (a) above, shall be added to the quantity of water actually in storage in that reservoir, and Actual Spill shall be deemed to have commenced when this sum equals the total capacity of that reservoir to the level of the uncontrolled spillway less capacity reserved for flood purposes, i.e., 1,998,400 acre-feet in the months of October through March inclusive, and 1,973,400 acre- feet in the months of April through September, inclusive, as determined from the 1999 area- capacity table or successor area-capacity tables and flood control storage reservation of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March.

(c) All water actually spilled at Elephant Butte Reservoir, or released therefrom, in excess of Project requirements, which is currently passed through Caballo Reservoir, after the time of spill, shall be considered as Actual Spill, provided that the total quantity of water then in storage in Elephant Butte Reservoir exceeds the physical capacity of that reservoir at the level of the sill of the spillway gates, i.e. -1,830,000 acre-ft in 1942.

(d) Water released from Caballo Reservoir in excess of Project requirements and in excess of water currently released from Elephant Butte Reservoir, shall be deemed Usable Water released, excepting only flood water entering Caballo Reservoir from tributaries below Elephant Butte Reservoir.

### DEPARTURES FROM NORMAL RELEASES /5

For the purpose of computing the time of Hypothetical Spill required by Article VI and for the purpose of the adjustment set forth in Article VII, no allowance shall be made for the difference between Actual and Hypothetical Evaporation, and any under-release of usable water from Project Storage in excess of 150,000 acre-ft in any year shall be taken as equal to that amount.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/2 Adopted at Fourth Annual Meeting, February 24, 1943.
/3 Amended September 9, 1998.
/4 Amended March 22, 2001; made effective January 1, 2001.
/5 Adopted June 2, 1959; made effective January 1, 1952.

## RULES AND REGULATIONS

### EVAPORATION LOSSES /6, /7, /8

The Commission shall encourage the equipping, maintenance and operation, in cooperation with the U.S. Weather Bureau or other appropriate agency, of evaporation stations at Elephant Butte Reservoir and at or near each major reservoir in the Rio Grande Basin within Colorado constructed after 1937 and in New Mexico constructed after 1929. The net loss by evaporation from a reservoir surface shall be taken as the difference between the actual evaporation loss and the evapo-transpiration losses which would have occurred naturally, prior to the construction of such reservoir. Changes in evapo-transpiration losses along stream channels below reservoirs may be disregarded.

Net losses by evaporation, as defined above, shall be used in correcting Index Supplies for the operation of reservoirs upstream from Index Gaging Stations as required by the provisions of Article III and Article IV of the Compact.

In the application of the provisions of the last unnumbered paragraph of Article VI of the Compact:

(a) Evaporation losses for which accrued credits shall be reduced shall be taken as the difference between the gross evaporation from the water surface of Elephant Butte Reservoir and rainfall on the same surface.

(b) Evaporation losses for which accrued debits shall be reduced shall be taken as the net loss by evaporation as defined in the first paragraph.

### ADJUSTMENT OF RECORDS

The Commission shall keep a record of the location, and description of each gaging station and evaporation station, and, in the event of change in location of any stream gaging station for any reason, it shall ascertain the increment in flow or decrease in flow between such locations for all stages. Wherever practicable, concurrent records shall be obtained for one year before abandonment of the previous station.

### NEW OR INCREASED DEPLETIONS

In the event any works are constructed which alter or may be expected to alter the flow at any of the Index Gaging Stations mentioned in the Compact, or which may otherwise necessitate adjustments in the application of the schedules set forth in the Compact, it shall be the duty of the Commissioner specifically concerned to file with the Commission all available information pertaining thereto, and appropriate adjustments shall be made in accordance with the terms of the Compact; provided, however, that any such adjustments shall in no way increase the burden imposed upon Colorado or New Mexico under the schedules of deliveries established by the Compact.

### TRANSMOUNTAIN DIVERSIONS

In the event any works are constructed for the delivery of waters into the drainage basin of the Rio Grande from any stream system outside of the Rio Grande Basin, such waters shall be measured at the point of delivery into the Rio Grande Basin and proper allowances shall be made for losses in transit from such points to the Index Gaging Station on the stream with which the imported waters are comingled.

/6 Amended at Tenth Annual Meeting, February 15, 1949.

/7 Amended at Twelfth Annual Meeting, February 24, 1951.

/8 Amended June 2, 1959.

## RULES AND REGULATIONS

### QUALITY OF WATER

In the event that delivery of water is made from the Closed Basin into the Rio Grande, sufficient samples of such water shall be analyzed to ascertain whether the quality thereof is within the limits established by the Compact.

### SECRETARY /8

The Commission, subject to the approval of the Director, U.S. Geological Survey, to a cooperative agreement for such purposes, shall employ the U.S. Geological Survey on a yearly basis, to render such engineering and clerical aid as may reasonably be necessary for administration of the Compact. Said agreement shall provide that the Geological Survey shall:

(1) Collect and correlate all factual data and other records having a material bearing on the administration of the Compact and keep each Commissioner adviser thereof.

(2) Inspect all gaging stations required for administration of the Compact and make recommendations to the Commission as to any changes or improvements in methods of measurement or facilities for measurement which may be needed to insure that reliable records be obtained.

(3) Report to each Commissioner by letter on or before the fifteenth day of each month, except January, a summary of all hydrographic data then available for the current year - on forms prescribed by the Commission - pertaining to:

(a) Deliveries by Colorado
(b) Deliveries by New Mexico
(c) Operation of Project Storage

(4) Make such investigations as may be requested by the Commission in aid of its administration of the Compact.

(5) Act as Secretary to the Commission and submit to the Commission at its regular meeting in February a report on its activities and a summary of all data needed for determination of debits and credits and other matters pertaining to administration of the Compact.

### COSTS /1

In February of each year, the Commission shall adopt a budget for the ensuing fiscal year beginning July first.

Such budget shall set forth the total cost of maintenance and operating of gaging stations, of evaporation stations, the cost of engineering and clerical aid, and all other necessary expenses excepting the salaries and personal expenses of the Rio Grande Compact Commissioners.

Contributions made directly by the United States and the cost of services rendered by the United States without cost shall be deducted from the total budget amount; the remainder shall then be allocated equally to Colorado, New Mexico and Texas.

/8 The substitution of this section for the section titled “Reports to Commissioners” was adopted at Ninth Annual Meeting, February 22, 1948.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.

RULES AND REGULATIONS

Expenditures made directly by any State for purposes set forth in the budget shall be credited to that State; contributions in cash or in services by any State under a cooperative agreement with any federal agency shall be credited to such State, but the amount of the federal contribution shall not so be credited; in event any State, through contractual relationships, causes work to be done in the interest of the Commission, such State shall be credited with the cost thereof, unless such cost is borne by the United States.

Costs incurred by the Commission under any cooperative agreement between the Commission and any U.S. Government Agency, not borne by the United States, shall be apportioned equally to each State, and each Commissioner shall arrange for the prompt payment of one-third thereof by his State.

The Commissioner of each State shall report at the annual meeting each year the amount of money expended during the year by the State which he represents, as well as the portion thereof contributed by all cooperating federal agencies, and the Commission shall arrange for such proper reimbursement in cash or credits between States as may be necessary to equalize the contributions made by each State in the equipment, maintenance and operation of all gaging stations authorized by the Commission and established under the terms of the Compact.

It shall be the duty of each Commissioner to endeavor to secure from the Legislature of his State an appropriation of sufficient funds with which to meet the obligations of his State, as provided by the Compact.

MEETING OF COMMISSION /1, /10

The Commission shall meet in Santa Fe, New Mexico, on the third Thursday of February of each year for the consideration and adoption of the annual report for the calendar year preceding, and for the transaction of any other business consistent with its authority; provided that the Commission may agree to meet elsewhere. Other meetings as may be deemed necessary shall be held at any time and place set by mutual agreement, for the consideration of data collected and for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approved by the Commissioner from each of the three signatory States.

(Signed) M. C. HINDERLIDER

M. C. Hinderlider

Commissioner for Colorado

(Signed) THOMAS M. McCLURE

Thomas M. McClure

Commissioner for New Mexico

(Signed) JULIAN P. HARRISON

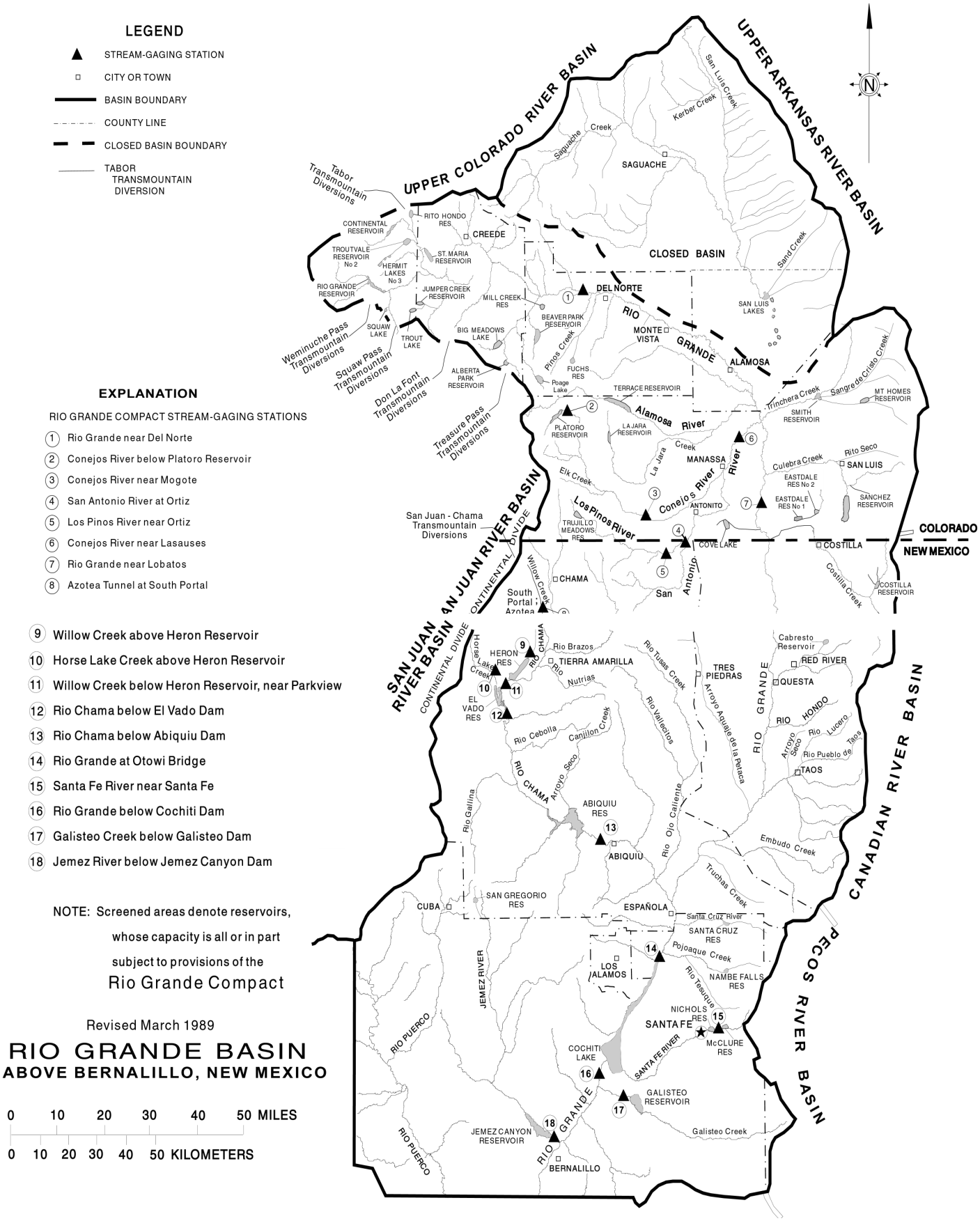
Julian P. Harrison

Commissioner for Texas

Adopted December 19, 1939.

/1 Amended at Eleventh Annual Meeting, February 23, 1950.

/10 Amended at Thirteenth Annual Meeting, February 25, 1952.


LEGEND
STREAM-GAGING STATION
CITY OR TOWN
BASIN BOUNDARY
COUNTY LINE
CLOSED BASIN BOUNDARY
TABOR TRANSMOUNTAIN DIVERSION
EXPLANATION
RIO GRANDE COMPACT STREAM-GAGING STATIONS
1 Rio Grande near Del Norte
2 Conejos River below Platoro Reservoir
3 Conejos River near Mogote
4 San Antonio River at Ortiz
5 Los Pinos River near Ortiz
6 Conejos River near Lasauses
7 Rio Grande near Lobatos
8 Azotea Tunnel at South Portal
9 Willow Creek above Heron Reservoir
10 Horse Lake Creek above Heron Reservoir
11 Willow Creek below Heron Reservoir, near Parkview
12 Rio Chama below El Vado Dam
13 Rio Chama below Abiquiu Dam
14 Rio Grande at Otowi Bridge
15 Santa Fe River near Santa Fe
16 Rio Grande below Cochiti Dam
17 Galisteo Creek below Galisteo Dam
18 Jemez River below Jemez Canyon Dam
NOTE: Screened areas denote reservoirs, whose capacity is all or in part subject to provisions of the Rio Grande Compact
Revised March 1989
RIO GRANDE BASIN
ABOVE BERNALILLO, NEW MEXICO
0 10 20 30 40 50 MILES
0 10 20 30 40 50 KILOMETERS
UPPER COLORADO RIVER BASIN
UPPER ARKANSAS RIVER BASIN
SAN JUAN RIVER BASIN
CANADIAN RIVER BASIN
PECOS RIVER BASIN
CONTINENTAL DIVIDE
CLOSED BASIN
COLORADO
NEW MEXICO
Tabor Transmountain Diversions
Weminuche Pass Transmountain Diversions
Squaw Pass Transmountain Diversions
Don La Font Transmountain Diversions
Treasure Pass Transmountain Diversions
San Juan - Chama Transmountain Diversions
SAGUACHE
CREEDE
DEL NORTE
MONTE VISTA
ALAMOSA
SAN LUIS
MANASSA
ANTONITO
COVE LAKE
COSTILLA
CHAMA
TIERRA AMARILLA
TRES PIEDRAS
QUESTA
RED RIVER
TAOS
ABIQUIU
ABIQUIU RES
CUBA
SAN GREGORIO RES
ESPAÑOLA
LOS ALAMOS
SANTA CRUZ RES
NAMBE FALLS RES
SANTA FE
NICHOLS RES
McCLURE RES
COCHITI LAKE
GALISTEO RESERVOIR
JEMEZ CANYON RESERVOIR
BERNALILLO
HERON RES
EL VADO RES
PLATORO RESERVOIR
LA JARA RESERVOIR
TERRACE RESERVOIR
SMITH RESERVOIR
EASTDALE RES No 1
EASTDALE RES No 2
SANCHEZ RESERVOIR
TRUJILLO MEADOWS RES
COSTILLA RESERVOIR
RIO HONDO RES
CONTINENTAL RESERVOIR
TROUTVALE RESERVOIR No 2
HERMIT LAKES No 3
ST. MARIA RESERVOIR
RIO GRANDE RESERVOIR
JUMPER CREEK RESERVOIR
MILL CREEK RES
BEAVER PARK RESERVOIR
SQUAW LAKE
TROUT LAKE
BIG MEADOWS LAKE
ALBERTA PARK RESERVOIR
FUCHS RES
Poage Lake
SAN LUIS LAKES
MT HOMES RESERVOIR
Saguache Creek
San Luis Creek
Kerber Creek
Sand Creek
Pinos Creek
Sangre de Cristo Creek
Trinchera Creek
Alamosa River
La Jara Creek
Elk Creek
Culebra Creek
Rito Seco
Conejos River
Los Pinos River
San Antonio
Willow Creek
South Portal Azotea
Costilla Creek
Horse Lake Creek
Rio Brazos
Rio Nutrias
Rio Tusas Creek
Rio Vallecitos
Arroyo Aguaje de la Petaca
Cabresto Reservoir
Rio Cebolla
Canjilon Creek
RIO CHAMA
Arroyo Seco
Rio Gallina
Rio Ojo Caliente
Embudo Creek
Truchas Creek
Santa Cruz River
Pojoaque Creek
Rio Tesuque
JEMEZ RIVER
RIO PUERCO
SANTA FE RIVER
Galisteo Creek
RIO GRANDE
Arroyo Seco
Rio Lucero
Rio Pueblo de Taos
RIO HONDO
TRES PIEDRAS
RIO GRANDE