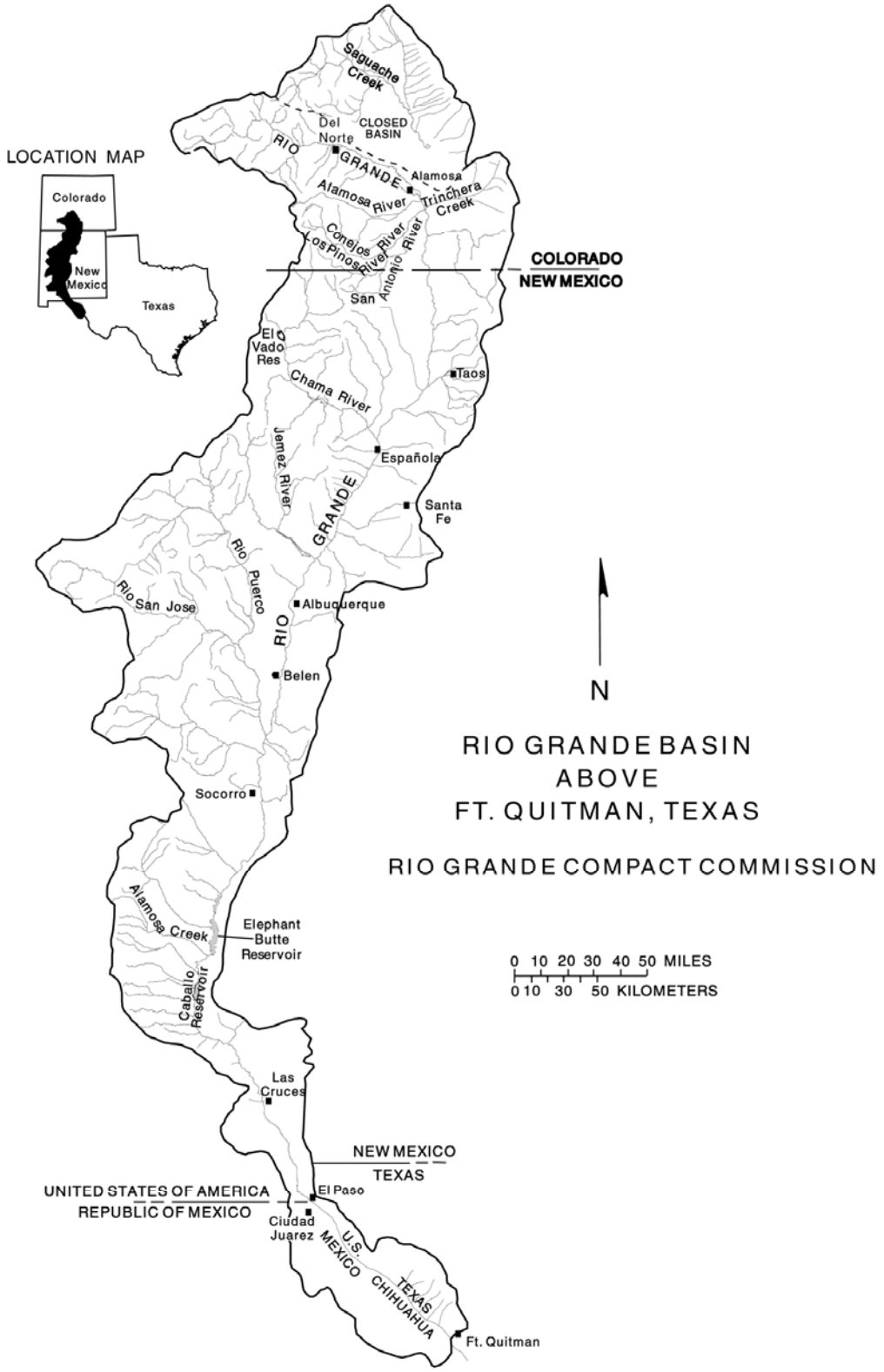
REPORT

of the

RIO GRANDE COMPACT COMMISSION

FOR CALENDAR YEAR 2020

TO THE GOVERNORS OF
Colorado, New Mexico and Texas


LOCATION MAP
Colorado
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Conejos River
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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
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Las Cruces
NEW MEXICO
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RIO GRANDE COMPACT COMMISSION

COLORADO NEW MEXICO TEXAS

April 8, 2021

The Honorable Greg Abbott
Governor of the State of Texas
Austin, Texas

The Honorable Jared Polis
Governor of the State of Colorado
Denver, Colorado

The Honorable Michelle Lujan Grisham
Governor of the State of New Mexico
Santa Fe, New Mexico

Honorable Governors:

The 82nd Annual Meeting of the Rio Grande Compact Commission was held via videoconference on April 8, 2021. The meeting was held to discuss Rio Grande Compact issues such as compact accounting and administration. Public comment was also received by the Commission.

The Commission reviewed the cost of operation and found that the expenses for the administration of the Rio Grande Compact were $203,868 in the fiscal year ending June 30, 2020. The United States bore $52,733 of this total; the balance of $151,135 was borne equally by the three States party to the Compact.

Upon printing, the Report of the Rio Grande Compact Commission for calendar year 2020 will be provided under separate cover.

Respectfully,

Patrick R. Gordon, Commissioner for Texas

Kevin G. Rein, Commissioner for Colorado

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

[1]REPORT OF THE ENGINEER ADVISERS TO THE RIO GRANDE COMPACT COMMISSION FOR CALENDAR YEAR 2020
April 8, 2021

Because of the on-going, global COVID-19 pandemic the Engineer Advisers to the Rio Grande Compact Commission met via video conference on February 2, 2021 and between March 1 and March 5, 2021 to:

- Receive reports;
- Prepare the 2020 Rio Grande Compact (Compact) water accounting;
- Discuss continuing and new issues in preparation for the 2021 annual meeting of the Rio Grande Compact Commission (Commission); and
- Prepare the Engineer Advisers' report.

The Engineer Advisers 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), the U.S. Fish and Wildlife Service (Service), and the City of Santa Fe (Santa Fe) at the meetings. The agencies each presented information about their specific water-related activities in the basin during calendar year 2020.

COMPACT ACCOUNTING

The Engineer Advisers reviewed the streamflow and reservoir storage records and other pertinent data for the Upper Rio Grande Basin during calendar year 2020 and are again unable to reach a consensus on the accounting. The lack of consensus arises from a disagreement that began in 2011 amongst the Texas Engineer Adviser and the New Mexico and Colorado Engineer Advisers on the release of credit water by Reclamation from Elephant Butte Reservoir in late summer 2011. As a result, the Engineer Advisers have not reached consensus on how to finalize the 2011 through 2020 Compact Delivery accounting sheets for Colorado and New Mexico and the Release and Spill from Project Storage accounting sheet. For 2020, as in previous years, each of the Engineer Advisers developed accounting methods described in the addenda to this

[1] ***This report is final and signed by the Engineer Advisers from Colorado, New Mexico, and Texas. At the April 8, 2021, Rio Grande Compact Commission meeting, the Commissioners did not accept the report.***

report. At its 2020 meeting, the Commission did not approve any of the proposed accounting methods. The Engineer Advisers continued to use the accounting methods they individually prepared to carry forward Compact accounting for the 2020 calendar year. As described in the New Mexico Engineer Adviser's addenda in previous years, the use of accounting methods 1 and 2 had an impact on the timing of Article VII storage restrictions and upstream storage operations. In 2020, however, Article VII timing went into effect on June 19, 2020 for both accounting methods.

For calendar year 2020, New Mexico carried an Accrued Debit of 38,800 acre-feet, in accordance with the New Mexico Engineer Adviser's accounting methodology. Article VI of the Rio Grande Compact states in part that, *"Within the physical limitations of storage capacity of such reservoirs, New Mexico shall retain water in storage at all times to the extent of its accrued debit."* For information on Article VI operations in 2020, please see the minutes of the November 2020 Rio Grande Compact Commission meeting and the addenda developed by each state attached to this report.

In 2021, Article VII restrictions will likely continue to prohibit New Mexico from storing native Rio Grande water other than relinquishment credit, therefore no debit water will be retained.

During the course of their review of the 2020 water accounting data, the Engineer Advisers discovered an error in the Release and Spill from Project Storage accounting sheet. The error first appeared on the 2012 accounting sheet (developed during the 2013 meeting of the Engineer Advisers) and continued through to the 2019 accounting sheets. For calendar years 2012 through 2019, Column 2 on the Release and Spill from Project Storage sheets incorrectly specified 1,974,600 acre-feet (May through September) and 1,999,600 acre-feet (September through March) as the Total Project Storage Capacity Available at End of Month. These numbers were the storage capacities of Elephant Butte Reservoir alone and did not include the Caballo Reservoir storage capacity. The corrected values, based on the area-capacity tables for Elephant Butte and Caballo reservoirs that took effect on January 1, 2020, are: 2,185,400 acre-feet (April 1 to September 30) and 2,210,400 acre-feet (October 1 to March 31). Column 2 on the Release and Spill from Project Storage accounting sheet also impacts Column 6, Unfilled Capacity of Project Storage at End of Month. It should be noted that this error had no impact on any state's end of year credits or debits, water operations or determination of the timing of a

spill. The Engineer Advisers have corrected the Release and Spill from Project Storage accounting sheet for 2020 going forward and recommend that the Secretary to the Commission correct the Release and Spill from Project Storage accounting sheets for years 2012 through 2019, when and if they are ultimately approved.

RIO GRANDE BASIN CONDITIONS

Snowpack and snow-water equivalent (SWE) amounts were near to well-below average for the winter of 2019-2020. Some snow courses in the northern portion of the basin in Colorado peaked at very close to average, while those farther south lagged significantly behind. However, even those areas with near average SWE in the winter experienced significant precipitation loss due to the windy spring conditions, and the very low soil moisture prevented much of the remaining water from reaching the rivers and streams. As a result, snowmelt runoff levels in 2020 were substantially below the long-term average for most areas across the basin in Colorado and in New Mexico.

Due to the low-runoff flows, Platoro Reservoir only reached a high of approximately 39 percent of capacity during early June of 2020. Usable Water in Rio Grande Project (Project) Storage was above the Article VII trigger of 400,000 acre-feet until June 19 when it fell below the 400,000-acre-foot threshold, imposing Article VII storage restrictions on post-compact reservoirs. Usable Water remained below 400,000 acre-feet throughout the rest of the year.

CONTINUING ISSUES

This section of the report summarizes new information about issues previously addressed by the Engineer Advisers. It reflects information obtained by the Engineer Advisers prior to the writing of the Engineer Advisers' report, including information obtained from the reports of the federal agencies and municipalities at the 2021 Engineer Advisers meetings or otherwise reported. The terms "reported" and "indicated" herein reflect information provided by various entities without analysis by the Engineer Advisers.

Middle Rio Grande Endangered Species Collaborative Program

The Middle Rio Grande Endangered Species Collaborative Program (Collaborative Program) was authorized by the Omnibus Appropriations Act of 2009 (P.L. 111-8). The Collaborative Program continues to seek innovative and collaborative ways to support Endangered Species Act (ESA) compliance for listed species while protecting water uses in the Middle Rio Grande. Reclamation reported that their federal appropriations in federal fiscal year (FY) 2020 were $3.84 million for Collaborative Program activities, including funding and contracting for continuation of endangered species monitoring and program management efforts. This is not expected to increase in FY 2021.

The Corps received a 51 percent cut to their Collaborative Program budget in FY 2020, with total appropriations of $1,178,000. In FY 2021, the budget for Corps funding for the Collaborative Program was cut to zero. Since 2010, the Corps has provided planning assistance for numerous activities within the MRG, but much of this will remain unfunded for the near future. These activities include long-term avian monitoring, sediment data collection for the Rio Puerco, San Acacia and San Marcial areas, as well as LiDAR remote sensing and collaborative aerial imagery analyses.

The Collaborative Program nonfederal signatories have provided a cost-share contribution of over 25 percent cash and in-kind services, with most of the cost share coming from the State of New Mexico. The Collaborative Program has begun to institute a new organizational structure including the Science and Adaptive Management Committee (SAMC) and Fiscal Planning Committee with a focus on scientific projects that address management decision making for water and species. The new website for the MRGESCP is *webapps.usgs.gov/MRGESCP*.

Update on WildEarth Guardian's Litigation over the 2003 Biological Opinion

In 2019, at the request of the Engineer Advisers, the Commission directed the Legal Committee to review the Federal District Court ruling in the *WildEarth Guardians v. U.S. Army Corps of Engineers* (case no. 1:14-cv-00666-RB-SCY) and to provide legal opinions on the implications and impacts, if any, to the Commission and the Compact. The Legal Committee reported at the November 12, 2020 Commission annual meeting that this case, in its current status, would not impact the Commission or the Compact.

Upper Rio Grande Water Operations Model

The Upper Rio Grande Water Operations Model (URGWOM) is a computational model developed through an interagency effort led by the Corps, Reclamation, and the New Mexico Interstate Stream Commission (NMISC). The effort includes regular meetings to discuss modeling outputs for daily water operations and accounting procedures. During 2020, URGWOM activities included:

- Developing an updated basin-wide annual operating plan (AOP) in collaboration with Reclamation and NMISC;
- Updating the database to include data from years 2015 to 2019 for the MRG and the Lower Rio Grande (LRG);
- Updating the Physical Model Documentation for the URGWOM public website;
- Compiling groundwater seepage reports and data for the MRG and the LRG for use in the future expansion of water quality modeling;
- Continuing enhancements to RiverWare for use in support of model development and continued refinements; and
- Implementing and calibrating the new aquifer objects to model deep aquifer head elevation and the groundwater movement between the shallow aquifer and the deep aquifer for the MRG and the LRG.

Key objectives for 2021 include:

- Preparing basin-wide AOPs for 2021;
- Incorporating the new deep aquifer objects into the official model and updating the official documentation. Expanding and updating the policy rules to incorporate construction changes at El Vado Dam;
- Incorporating RiverWare into Corps Water Management System (CWMS) for real-time operational linking and monitoring;
- Adding upgrades to RiverWare to continue model enhancements to refine the calibration and create additional opportunities for uses of URGWOM;
- Continuing the partnership to monitor water quality and collect data with the USGS; and
- Collaborating with Reclamation for an expansive online URGWOM training platform.

Compliance by Federal and State Agencies with State Water Law

The NMISC continues to track habitat restoration projects implemented by various federal and state agencies, and to account and report on related depletions in the MRG. It coordinates with the New Mexico Office of the State Engineer (NMOSE) to determine if a permit is needed and to ensure the depletions are offset by the projects' sponsors. The NMISC reported that it continues to coordinate with the Corps on several habitat restoration projects to ensure that those depletions are offset. The NMISC also coordinates with Reclamation in using the State's Strategic Water Reserve for ESA-related water management, including offsetting depletions associated with habitat restoration and river augmentation activities. Below-average snowmelt runoff in 2020 resulted in no depletion offset requirements for habitat restoration projects.

Elephant Butte Delta Channel Project

The below-average snowmelt runoff and a weak monsoon season resulted in the Elephant Butte Delta Channel (Delta Channel) successfully conveying all flows during 2020. Extremely low reservoir levels in the fall and early winter of 2020 exposed the second sediment plug that was observed in 2019. This sediment plug could not be excavated in 2019 because it was within the active pool of the reservoir. During October, November, and December of 2020, the NMISC construction contractor excavated the now exposed second sediment plug and performed other regular maintenance to the Delta Channel in the area below the Narrows, including constructing approximately two additional river miles of channel downstream from the plug area. Since 2003, New Mexico has spent nearly $20 million to construct and maintain the Delta Channel and continues to partner with Reclamation, who provides engineering support and environmental compliance for the project.

Relinquishment Update

The total amount of Accrued Credit relinquished by Colorado since 2013 is 3,000 acre-feet. Colorado stored 488 acre-feet of relinquishment credit water in 2020. Between 2013 and 2020, Colorado stored a total of 2,556 acre-feet of relinquishment credit water in Platoro Reservoir, which leaves a balance of 444 acre-feet in Colorado's relinquishment account.

The total amount of Accrued Credit relinquished by New Mexico since 2003 is 380,500 acre-feet. No relinquishment credit water was stored in New Mexico reservoirs during the 2020 calendar year. Relinquishment-credit water storage to date totals 288,728 acre-feet, leaving a balance of 91,772 acre-feet available to be stored in future years when Article VII storage restrictions are in effect.

Article VII storage restrictions will likely be in effect for the 2021 snowmelt runoff season. However, given New Mexico's Accrued Debit status, the Rio Grande Compact Commissioner for New Mexico may direct that no available relinquishment credit water be stored during the 2021 snowmelt runoff season, unless there is a substantial improvement to New Mexico's Water Supply Forecast prior to runoff.

Gaging Station Review

The Colorado Division of Water Resources (CDWR) reported on activities at Colorado's Compact gages. The Colorado USGS reviewed gaging station records for the seven Colorado Compact gages and approved all of those records for 2020. The CDWR made an average of 29 measurements at each of these seven compact gaging stations, with the ratings of those measurements varying from excellent to poor. The records for most of these stations were rated as 'good' except for the periods of estimation, which were rated as 'poor'.

A steel cross-sectional area was constructed at the South Channel near La Sauses gage during the summer to improve the accuracy of low-flow measurements. A new radar sensor was installed at the Conejos near Mogote gage in April 2020.

For the Rio Grande near Otowi streamflow gage (#08313000), the USGS reported that in calendar year 2020 they developed a new stage discharge rating (#41) which was implemented on June 2, 2020 and used for the remainder of 2020. The USGS made a total of 15 measurements at the Otowi gage in 2020, with 12 rated good, 1 rated fair, and 2 rated poor. For 2020, the USGS continued to utilize redundant primary sensors (non-contact radar and wire weight) as well as redundant secondary reference gages (bubbler and staff gage) for gage height readings. The USGS also indicated that the Rio Grande above Buckman gage (#08313150),

installed by the USGS upstream of the City of Santa Fe's Buckman Direct Diversion Project in 2017, continues to help verify the Otowi gage record.

The USGS reported that during the 2020 calendar year, 20 measurements were collected at the Rio Grande below Elephant Butte streamflow gage (#08361000). Of the 20 measurements, 11 were rated good, 5 were rated fair, and 4 were rated poor. Aquatic vegetation growth on the streambed at the USGS gaging station section continues to cause a low bias in gaged flow during certain months. This issue has occurred for an undetermined period of time but began to be addressed in 2016 by utilizing an alternate section which is not impacted by vegetation growth during certain months. The gage records for 2016 through 2020 reflect improved precision, and the NMISC will continue to coordinate with the USGS to provide more accurate gage records in the future.

At the 2021 pre-Engineer Advisers' meeting, Reclamation stated that they have completed the construction of the new gage on the opposite side of the river from the existing gage at the Rio Grande below Caballo Reservoir. Reclamation stated that they have decided to operate the existing gage until it is no longer functional, and then switch the equipment to the new gage.

The USGS also reported that they reviewed and approved the 2020 streamflow gage below Caballo (#08362500) flow records developed by Reclamation, and that all necessary documentation was provided. The USGS reported that the record accuracy looked good, in large part due to the high number of measurements made at the gage (63 in total). In 2020, Reclamation and the USGS utilized five Acoustic Doppler Current Profiler (ADCP) measurements to calibrate the Acoustic Doppler Velocity Meter (ADVM). They are continuing to develop a rating for ADCP measurements and for data quality. The USGS stated that once the quality control issues have been resolved, measurement quantity could be reduced by fully utilizing the ADVM installed at the site. The USGS also reported that they ran levels in cooperation with Reclamation in 2020 to verify datum at the site.

During 2020, the NMISC continued its survey of water-level elevations in Elephant Butte and Caballo reservoirs. NMISC's surveyor performed surveys alongside Reclamation staff in June and December 2020. Both the June and December 2020 results from NMISC's survey indicated that Reclamation's reservoir stage elevations were within the agreed upon threshold

criteria. Reclamation performed routine stage elevation surveys throughout 2020 and made adjustments to the stage-discharge recorder (SDR) a total of six times during the year.

In 2020, Reclamation continued to measure Elephant Butte elevation via the SDR and a bubbler. The bubbler, which is maintained in conjunction with the USGS, shows more scatter but in general more accurately reflects observed elevation when the reservoir is low. In August 2020, the SDR was damaged by a lightning strike, and it was replaced by the USGS. Reclamation continues to closely monitor data, but feels that, while physical improvements may help, continued vigilance is most important because the reservoir elevation may vary so much in a single season. Reclamation continues to provide email updates to the Engineer Advisers describing any discrepancies between lake elevation surveys and the SDR, and corrective actions taken. NMISC and Reclamation will continue to perform side-by-side surveys at select times during 2021 to ensure the accuracy of the reservoir elevation data.

Mass Balance Review

The NMISC conducted a mass balance analysis for the Rio Grande between the Elephant Butte and Caballo gages for calendar year 2020. The mass balance analysis indicated that the reach gained water in nine out of twelve months with a total calculated annual gain of 2,573 acre-feet. A significant portion of the gain occurred during the June-through-October period although there was no significant monsoon precipitation.

Gaging Station Costs

In recent years, the Engineer Advisers and Compact Commissioners have expressed concern over the large difference in costs between what Reclamation charges to operate the gage below Caballo Reservoir as compared to what the Colorado Division of Water Resources (CDWR) and USGS charge on average for other Compact gages. The three Compact states split the costs of their operations in support of the Compact equally, including operation and maintenance of the Compact gaging stations.

For FY 2022, Reclamation decreased their charged amount for the gage below Caballo Reservoir. However, the cost charged by Reclamation is still approximately 36 percent more than the average cost charged per gage by CDWR and the USGS. The Engineer Advisers remain

concerned with Reclamation's high cost for the operation of this gage and with the large fluctuations in the charged costs year to year.

Additionally, the USGS Colorado Water Science Center has greatly increased their charges related to the review of the seven Colorado Compact gage records. This cost has almost doubled in the last two years, going from $8,870 for FY 2020 to $17,240 in FY 2022. This review cost is significantly higher than the review cost charged by the USGS New Mexico Water Science Center. The Engineer Advisers are concerned about this drastic rise in costs from the USGS Colorado Water Science Center and will request justification for the increase.

Review of Compact Accounting Data

The document, titled "Schedule for Review and Approval of the Rio Grande Compact Accounting Records for the Previous Year," authorized at the 2016 RGCC meeting, outlines a process and schedule for development, evaluation, and approval of required RGCC accounting records. For calendar year 2020, city, state, and federal agencies followed the schedule. The process will be reviewed and revised as necessary to meet Compact business needs.

YEAR 2020 OPERATIONS

Closed Basin Project

The total production of the Closed Basin Project in calendar year 2020 was 9,911 acre-feet. This total includes water that was exchanged for Colorado Parks and Wildlife water to be delivered to the Blanca Wildlife Habitat Area, the Alamosa National Wildlife Refuge and to the San Luis Lakes State Wildlife Area. The amount creditable to the Rio Grande for Compact purposes from direct delivery and exchange was 6,498 acre-feet. The remainder of the water produced was delivered to various federal lands along the project to be used as mitigation for the project footprint. All of the water delivered to the Rio Grande in 2020 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 2020, rehabilitated twelve other wells, and installed seven new pumps. Wells will continue to be replaced as budgetary constraints

allow in an effort to help maintain project production. The Closed Basin Operating Committee continues to monitor groundwater levels and groundwater production and to adjust project operations pursuant to the enabling legislation.

Colorado Groundwater Regulations

In late 2015, the State Engineer of Colorado completed the development of rules and regulations concerning the use of groundwater in the Upper Rio Grande Basin in Colorado. These rules were approved by the Colorado Division 3 (Rio Grande Basin) Water Court in 2019 and will go into full effect on March 15, 2021. As an integral part of these rules, the State Engineer of Colorado has also completed the development of Phase 6 of the Rio Grande Decision Support System Model. This model captures the interaction between surface and groundwater and shows the effect that wells have on senior surface water rights. These new rules require that, beginning on March 15, 2021, owners of non-exempt wells mitigate the injurious depletions that their wells cause to senior surface water rights diverters, and they also require that the well owners ensure the sustainability of the groundwater aquifers. There are currently seven groundwater user subdistricts and multiple individual augmentation plans that have been developed as a way for the well owners to comply with the new rules.

Aamodt Settlement and Pojoaque Basin Regional Water System

The Aamodt Water Rights Settlement Agreement (Settlement Agreement) was developed through multi-party negotiations, which began in 2000 between the Pueblos of Nambé, Pojoaque, Tesuque and San Ildefonso, the State of New Mexico, the United States of America (U.S.), Santa Fe, Santa Fe County, and representatives of non-Pueblo water users, to settle the Pueblos' water right claims in the Pojoaque Basin. The Settlement Agreement provides for the funding and construction of the Pojoaque Basin Regional Water System to supply treated water to Pueblo and non-Pueblo parties. As expressly stated in the Settlement Agreement, "Nothing in this agreement shall be construed to limit the authority of the State Engineer to…ensure compliance with the Rio Grande Compact," (Section 6.6.1.6). The Engineer Advisers will continue to evaluate the project as it moves forward including evaluating potential impacts to the Otowi Index Supply.

The final Pojoaque Basin Regional Water System Environmental Impact Statement was published in the Federal Register in January 2018 and the Record of Decision was signed on September 11, 2019. Original cost estimates were well above the amount authorized for the project, but the settlement parties signed an agreement that renegotiated cost shares and cost savings measures for the project on September 17, 2019. In 2020, additional Cost Sharing, System Integration and Contributed Funds Agreements were signed by Santa Fe County and Reclamation. Construction began on the intake area of the Regional Water System in June 2020 and is expected to be completed in April 2021. The remainder of Phase 1 construction is expected to be completed by 2028. No diversions, river sampling, or water quality analysis of Rio Grande water occurred in 2020.

Reclamation's Middle Rio Grande Supplemental Water Program

Reclamation's supplemental water program is intended to provide additional water, primarily obtained through the voluntary leasing of San Juan Chama Project (SJCP) water, for endangered species needs and compliance with the 2016 Biological Opinion (BO). In 2020, Reclamation reported a total of 29,267 acre-feet of supplemental water was released for endangered species purposes. Of that volume, 22,267 acre-feet was SJCP water Reclamation leased from 2019 and 2020 contractor allocations. The release of supplemental water began on April 6 and continued through October 24. Reclamation also released 7,000 acre-feet of water leased from Albuquerque Bernalillo County Water Utility Authority's (ABCWUA) SJCP water stored in Abiquiu Reservoir from September 9 through October 4. Of these 7,000 acre-feet, MRGCD and NMISC contributed funds for 2,500 acre-feet and 1,000 acre-feet, respectively.

Reclamation ended 2020 with a total of 1,276 acre-feet of SJCP water in storage: 408 acre-feet of 2020 leased SJCP water in Abiquiu Reservoir and 868 acre-feet of water in Heron Reservoir, all acquired via short term leases or other water contracts.

In addition to the water released by Reclamation, 512.3 acre-feet of SJCP water leased by Audubon New Mexico and 293.61 acre-feet of pre-1907 native water rights owned or leased by Reclamation were released as needed between May 6 and September 14 in 2020.

At one time, Reclamation maintained portable pumps at four strategic locations along the Low Flow Conveyance Channel (LFCC) to maintain river connectivity to the Elephant Butte Reservoir pool. Reclamation only equipped the south boundary site in 2020, which was in operation

from May 1 through July 13, and again in early August through August 26. The Neil Cupp site is now operated by MRGCD and was pumping water to the river in the spring of 2020.

MRGCD pumped 1,350 acre-feet from the Neil Cupp site in 2020. Supplemental flow provided at the south boundary site was 5,188 acre-feet. With MRGCD's pumping at Neil Cupp, a total volume of 6,538 acre-feet were pumped from the LFCC to the river in 2020.

Six Middle Rio Grande Pueblos Prior and Paramount Operations

BIA requested that Reclamation store 20,095 acre-feet of Rio Grande water in El Vado Reservoir for the Coalition of Six Middle Rio Grande Basin Pueblos' (Pueblos) Prior and Paramount (P&P) operations in 2020. The entire amount was stored outside of the time that Article VII Compact restrictions were in place. A total 17,771 acre-feet was released for irrigation with 1,573 acre-feet returned to MRGCD in June, August, and September. A total of 751 acre-feet was lost to evaporation. No P&P releases took place after September 30. The remaining 91 acre-feet was transferred to the MRGCD storage account in the URGWOM. It was then released to Elephant Butte by the MRGCD less 4 acre-feet of evaporation loss.

Based on the March 2021, most-probable snowmelt runoff forecast, the BIA reported that Reclamation will have a preliminary storage target of approximately 28,000 acre-feet for their P&P operation in 2021. Additional forecasts in April and May could change this storage target.

The BIA was able to make limited funding available to the Pueblos to perform work upgrading their irrigation systems. Due to the COVID-19 pandemic, very little work was performed on Pueblo lands in 2020. The BIA also provides funds to the MRGCD to perform maintenance work on the systems which serve Pueblo lands. This work was also hampered due to the pandemic restrictions.

The BIA reported that discussions concerning the carryover storage of P&P water in El Vado are occurring infrequently, and no request to allow carryover storage is anticipated in the near future.

The Engineer Advisers remain concerned about the procedures for quantifying storage, release, and delivery of water for the P&P lands of the 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. The BIA is interested in

incorporating a separate URGWOM account for the native Rio Grande flows at Otowi to improve P&P operations.

2020 Rio Chama Water Supply Conditions

Snowpack conditions in the Rio Chama Basin were well-below average during the winter of 2019-2020. The March through July native inflow to El Vado Reservoir was 89,629 acre-feet, or approximately 36 percent of average.

Beginning in early summer, flows on the Rio Chama were insufficient to meet the direct-flow irrigation needs of the Rio Chama Acequia Association (RCAA). RCAA represents 16 acequias on the Rio Chama between Abiquiu Reservoir and the confluence with the Rio Grande that have direct surface flow diversion rights. With insufficient native flows to meet their needs and the absence of sufficient leased San Juan Chama Project Water, the NMOSE curtailed RCAA diversions to the available natural flow of the river from summer through fall of 2020.

Reclamation's Identification of San Acacia Reach Options

Reclamation reported on a new planning and coordination effort in the middle Rio Grande called the Identification of San Acacia Reach Options (ISARO). In 2020, Reclamation hosted internal and external workshops to evaluate actions that improve delivery of water to Elephant Butte Reservoir, reduce costs associated with system operation and maintenance, and maintain and enhance ecosystem health. The external workshop included the NMISC, MRGCD, Service, Bosque del Apache National Wildlife Refuge (BDANWR) and Armendaris Ranch. The geographic extent of the planning is from the Highway 380 bridge downstream to the Narrows of Elephant Butte Reservoir.

Reclamation expects that outcomes from these workshops will continue to be refined during 2021 and that the effort will include projects that were previously included in Reclamation's Lower Reach Plan.

The New Mexico Engineer Adviser remains concerned about depletions in the San Acacia reach. Reclamation has committed to work with NMISC to establish a methodology to quantify depletions and to offset any increased depletions. The Engineer Advisers support the intent of the ISARO but want to ensure that the projects improve deliveries of water to Elephant

Butte Reservoir and that Reclamation maintains the conveyance capacity of the river channel as authorized by the Middle Rio Grande project.

Rio Grande Project Operations

Reclamation's initial allocation for calendar year 2020 for El Paso County Water Improvement District No. 1 (EP No. 1) and Elephant Butte Irrigation District (EBID), was delayed until March because the 2018 and 2019 allocations were not finalized. The allocation balance from the previous year was needed to determine the current year's allocation. In early 2020, Reclamation, EBID and EP No. 1 reviewed and adjusted the accounting for both 2018 and 2019.

Mexico was provided an initial allocation in January 2020. Based on the provisions of the 1906 Convention for extraordinary drought, the allocations to Mexico were updated monthly, with a final in-season allocation in April 2020 of 50,362 acre-feet, which is 84 percent of a full allocation. Mexico's allocation is calculated from the anticipated release of Usable Water. Once allocated, the U.S. cannot reduce the allocation even if the anticipated release or actual release is significantly less than originally planned.

In May, EP No. 1 determined it would not order all its 2020 allocated water, causing the actual Caballo Reservoir release to be significantly less than the water available for release. Therefore, the final allocation to Mexico was 43,968 acre-feet (73% of a full allocation). The over delivery of water to Mexico is charged to the U.S. districts. Since the over delivery of water was due to operations by EP No. 1, the full amount of the over delivery was charged to EP No. 1.

Reclamation reported a final 2020 release from Caballo Reservoir during the irrigation season of 592,869 acre-feet for all three Project water users: EP No. 1, EBID, and Mexico. A total of 525,864 acre-feet of water were delivered to the Project water users. The 2020 deliveries are considered to be provisional until an agreement is reached between the districts and Reclamation.

The final in-season allocation was 622,869 acre-feet, including Mexico's allocation of 43,968 acre-feet. Reclamation reported that end-of-year allocations at the diversion headings to EBID were 197,694 acre-feet and 381,207 acre-feet to EP No. 1. The calculated charges were 268,582 acre-feet to EP No. 1 and 198,314 acre-feet to EBID. EP No. 1 was also charged with

6,762 acre-feet for the over delivery to Mexico. The allocation balances for EBID and EP No. 1 were -620 acre-feet and 97,625 acre-feet, respectively.

During 2020, Reclamation's report indicates flows into Hudspeth County Conservation and Reclamation District No. 1 (HCCRD) during March through September were 45,792 acre-feet of tailwater. The calendar year total flow data for HCCRD was 55,620 acre-feet. Additionally, 1,138 acre-feet was delivered through the Bonita Lateral during calendar year 2020.

The USGS reported that the total annual flow volume at the gage below Elephant Butte dam was 612,938 acre-feet. Elephant Butte Reservoir storage peaked at 611,125 acre-feet on March 2, 2020, and storage at Caballo Reservoir peaked at 80,437 acre-feet on March 23. Releases from Caballo Reservoir for irrigation deliveries began on March 13 and ended on September 25, 2020. EP No. 1 and Mexico began the season with coordinated orders and diversions. EP No. 1 ended all diversions on September 25, 2020. EBID delayed their initial order, and their diversions began on April 13 and ended on August 28, with Mexico ending on September 7.

In January 2020, there was 578,707 acre-feet of Usable Water in Project Storage (Elephant Butte and Caballo reservoirs combined) and 155,864 acre-feet on December 31. According to Method 1 utilized by the URGWOM, Usable Water reached a high of 653,515 acre-feet and low of 109,011 acre-feet on March 12 and September 25, respectively.

Combined end-of-year storage at Elephant Butte and Caballo reservoirs was 156,702 acre-feet, which is about 7 percent of their total conservation capacity. Due to implementation of new area-capacity tables on January 1, 2020, Caballo Reservoir lost about 425 acre-feet of capacity between the 2017 and 2007 sediment surveys and has lost 22,227 acre-feet since 1938.

On December 1, 2020, Usable Water in Elephant Butte and Caballo reservoirs was 128,927 acre-feet. Therefore, Reclamation determined that the initial 2021 allocation was 0 acre-feet. On February 1, 2021, the calculated Usable Water (using the estimated 2021 Compact credit in Elephant Butte Reservoir) was 182,057 acre-feet. With this increase in storage, Reclamation allocated 2,458 acre-feet to Mexico. EBID and EP No. 1 have requested no official allocations until April 2021.

Based on the January 2021 snowmelt runoff forecast for the Rio Grande at San Marcial of 186,000 acre-feet (36 percent of average), the current La Niña conditions for El Niño

Southern Oscillation activity, and current hydrologic conditions, Reclamation anticipates a near-record low allocation for 2021 and expects a shortened irrigation season beginning around June 1 and lasting for six to eight weeks.

The New Mexico Engineer Adviser expressed concern about continued use of the 2008 Operating Agreement for the Project. These concerns include changes in Reclamation's reported annual allocation and delivery values since 2008. Additionally, the New Mexico Engineer Adviser expressed concern over operational and administrative changes that have been made under the Operating Manual.

ADDITIONAL FEDERAL AGENCY REPORTED INFORMATION

Representatives of USGS, Reclamation, Corps, Service, and IBWC presented additional information to the Engineer Advisers as summarized below:

U. S. Geological Survey

The Engineer Advisers received reports from the USGS on their Rio Grande Basin projects. The USGS completed a four-year WaterSMART Focus Area Study in 2019 to assess water use and availability from the headwaters in southern Colorado to Fort Quitman, Texas, and continues to finalize the associated reports. The study investigated water use based on the eight-digit hydrologic unit code (HUC-8), evapotranspiration, snow and watershed processes, groundwater, and surface water. The data were analyzed and made easily accessible for use by stakeholders. The study was conducted by personnel from the USGS Colorado, New Mexico, Utah, and Texas Water Science Centers and the USGS Earth Resources Observation and Science Center. All reports for the study are expected to be completed by mid-2021, and data and reports are available on the Upper Rio Grande Basin Focus Area Study website.

The USGS, in cooperation with Reclamation, has developed a model of the transboundary aquifers and interconnected surface waters of the Palomas and Mesilla basins in New Mexico and Texas and the Conejos-Médanos Basin of northern Mexico, known as RGTIHM. The model is operational, and an interim report was published in May of 2018. A Techniques and Methods Report on the MODFLOW One-Water Hydrologic Flow Model used for RGTIHM was released in 2020, and updates to model parameters were incorporated in 2020.

Final recalibration and a Scientific Investigations Report are planned for 2021. Through the Mesilla Basin Monitoring Program, which is supported by several cooperators, the USGS continues to maintain an observation well network and hydrologic cross sections in the Mesilla valley, and to monitor salinity in shallow groundwater in the Mesilla Valley. The Engineer Advisers also received a report on review procedures for non-USGS streamflow records in New Mexico and Colorado.

Corps Rio Grande Civil Works Projects

The Corps reported on the status of Civil Works projects under the Water Resources Development Act (WRDA) of 2020, which provided reauthorization for the Rio Grande Environmental Management Program in Colorado, New Mexico, and Texas. Authorization for this program was extended through federal FY 2029. Current projects undergoing either a feasibility study, higher-level planning, or construction include: Abiquiu Dam legislation, Bernalillo to Belen Levee Project, and Sandia to Isleta ecosystem restoration.

Zebra Mussels/Quagga Mussels

The Engineer Advisers continue to be concerned about the possible infestation of Zebra and Quagga mussels in the Upper Rio Grande basin and their possible spread throughout the entire basin. Reclamation has engaged in public outreach efforts since 2009.

The number of watercraft inspections in New Mexico has increased from 9,346 in 2013 to 42,929 in 2020. Of these, 42 percent of the inspections and 28 percent of the decontaminations were conducted at Elephant Butte Reservoir. In 2020, Reclamation collected 48 water samples from seven of its New Mexico reservoirs (Navajo, Heron, El Vado, Elephant Butte, Caballo, Sumner, and Brantley). These samples were analyzed by microscopy and molecular methods, providing early detection, and can be used to trigger immediate containment action. In 2020, there were no detections of invasive mussels or their markers by Reclamation's Ecological Research Laboratory, operating in Denver, Colorado. Continued vigilance is important, as conditions more suitable to aquatic invasive species establishment may occur in the future.

Rio Grande Silvery Minnow

The Service and Reclamation reported on the 2020 monitoring results for the Rio Grande silvery minnow using the October Catch per Unit Effort (CPUE) data typically used to report long-term trends in relative abundance.

The 2020 October CPUE survey for the MRG estimated a silvery minnow density of 0.23 silvery minnow/100 square meter (m^2), a decrease from 3.41 in 2019. The Service has acknowledged previous efforts in 2018 by water managers to ensure survival of the species, and they have determined that the low 2018 CPUE will not be counted against the proposed action in the BO. The Service recognized that the low density in 2018 was a result of climatic conditions and not of the BO partner agencies' actions. While the Service recognizes that climatic conditions are also a factor in 2020 CPUE, they have not received the 2020 Annual Biological Opinion report and are still evaluating whether the 2020 density counts against the proposed action.

The Service reported that 310,634 silvery minnows were augmented to the Middle Rio Grande in 2020, more than triple the 83,635 released in 2019. Fish were provided by the City of Albuquerque's BioPark, the Service's Southwestern Native Aquatic Resources and Recovery Center located in Dexter, New Mexico, and the NMISC's Los Lunas Silvery Minnow Refugium. The Service, with assistance from the BO partners, conducted rescue activities in the San Acacia and Isleta reaches for 2020, rescuing and relocating 3,914 silvery minnows to flowing portions of the river.

Other 2020 activities include fish passage design criteria for the San Acacia and Isleta Diversion Dam, as well as the ISARO planning process. This process is part of the Lower Reach Plan, which includes the river realignment pilot and other projects near BDANWR. Further progress is noted on River Integrated Operations (RIO), the adaptive management framework for testing and refining the Service's hydrobiological objectives.

Temporary Modification of Operations at El Vado Reservoir

In 2019, at the request of the Engineer Advisers, the Commission directed the Legal Committee to review the request for future deviations at El Vado Reservoir for endangered species to determine if it can be accomplished in a manner that does not violate Article VII of the Compact.

The Legal Committee reported at the November 12, 2020 Commission annual meeting that it had studied the issues related to the deviations at El Vado but did not reach consensus on any recommended actions that should be taken regarding whether a future request for deviations at El Vado for endangered species would affect the Compact. It is not anticipated that an El Vado modification will be requested for the snowmelt runoff period in 2021.

El Vado Dam Repairs

Reclamation reported that substantial degradation of the steel lining system and service spillway have occurred at El Vado Dam. Corrective action studies have determined that construction and repair work need to be conducted at the dam. The planned El Vado Safety of Dams Project will occur in two phases: 1) embankment seepage reduction, which will involve installation of a synthetic liner system across the entire face plate of the existing dam, and 2) spillway repair and refurbishment. Reclamation anticipates that a contract for the Embankment seepage reduction phase of the project will be awarded in August 2021 with contractor mobilization occurring in March 2022. The El Vado spillway repair and refurbishment 60-percent design phase was completed in August 2020, and a contract is expected to be awarded by May of 2023.

During both phases of construction, there will be restrictions on storage of water in El Vado Reservoir, and Reclamation continues to work with the Corps to provide an alternate location for native water storage at Abiquiu Reservoir during El Vado Dam and spillway construction activities. Reclamation and the Corps are evaluating changes needed to the Corps' Water Control Manual for Abiquiu and incorporating those changes into URGWOM, however, Reclamation reported that no new accounting procedures will be needed. The New Mexico Engineer Adviser indicates that, in addition to changes to the Water Control Manual, it will be necessary for Reclamation to seek and obtain favorable advice and consent from the Rio Grande Compact Commission, as well as obtain emergency authorization through the New Mexico Office of the State Engineer for native water storage in Abiquiu Reservoir during the El Vado dam construction work.

Middle Rio Grande Project Channel Maintenance

Reclamation's report indicates it is pursuing work at 17 active priority sites along the MRG Project reach where bank erosion or reduced channel capacity could cause levee failure. Of the active priority sites, five require an annual review of channel capacity and possible maintenance due to sediment accumulation. Reclamation reported that maintenance work at the River Mile 202.2 project area near Sandia Pueblo (Sandia Priority Site), began in early 2020 but that progress has been impeded due to the COVID-19 pandemic. This project includes major side-channel construction intended to provide increased channel capacity, resulting in less lateral migration, as well as habitat improvements for listed species.

Reclamation reported that the BDANWR Pilot Realignment Project was substantially completed in September 2020. Work on the project continued with repositioning the excavation spoils in the previous channel area. Reclamation reported that due to the low snowmelt runoff, the realigned channel has not seen high enough flows to further advance the river slope adjustment from the new downstream connection. The New Mexico Engineer Adviser notes that the current channel is undefined through a significant portion of the project, resulting in extensive open water that likely has a negative impact to Compact deliveries.

Vegetation Management at Elephant Butte and Caballo Reservoirs

Reclamation reported that it performed vegetation maintenance at Caballo Reservoir during 2020, but that it did not use State of New Mexico funds because of the state's concerns with mowing locations. Reclamation reported that maintenance at Caballo Reservoir included approximately 891 acres of phreatophytic vegetation clearing by utilizing mowers and mulchers, in addition to approximately 700 acres that were maintained to be free of woody phreatophytes by means of longer-term inundation during the irrigation season.

Since 2017, the Engineer Advisers have requested Reclamation complete a draft plan for further vegetation control and discuss the plan with the Service. Reclamation has not provided the Engineer Advisers with a report or plan on this request. The Engineer Advisers remain concerned about the lack of vegetation management activities by Reclamation at Elephant Butte Reservoir. The State of New Mexico is reluctant to continue the Vegetation Management Agreement if Elephant Butte Reservoir is not included in the effort.

Southwestern Willow Flycatcher and Yellow-billed Cuckoo

Reclamation and others continued to conduct surveys and nest monitoring for the southwestern willow flycatcher (flycatcher) and western yellow-billed cuckoo (cuckoo) during the summer along the Rio Grande. Unfortunately, survey efforts were impacted by restrictions due to the COVID-19 pandemic that resulted in fewer surveys being completed in 2020. Because of this, the Service has acknowledged that while decreases in territories are apparent in the 2020 results, this may not represent the actual species condition within the MRG.

For 2020, 265 flycatcher territories were documented from Albuquerque to the Texas state line, down from 440 in 2019. Most flycatchers were present in the San Marcial and Elephant Butte Reservoir area, as is typically the case.

Reclamation has historically conducted surveys for the cuckoo from Belen to El Paso, Texas. In 2020, Reclamation conducted surveys only from Highway 380 (San Antonio, NM) to Elephant Butte Reservoir. Within this area, an estimated 66 cuckoo territories were observed.

A final revised proposal of critical habitat for the cuckoo will be available in April 2021. The 2017 petition to delist the cuckoo was denied in 2020 and the bird retains its threatened status under ESA. The proposed critical habitat includes a 10-mile-long segment of the Ohkay Owingeh Pueblo near Alcalde, New Mexico; a 6-mile-long segment near San Ildefonso Pueblo upstream to La Mesilla; and a continuous 170-mile-long segment from Elephant Butte Reservoir (at River Mile 54) to Cochiti Dam.

The tamarisk leaf beetle is currently present in most of the Rio Grande area, and defoliation of saltcedar in occupied territories may result in impacts to nesting success. Reclamation, in coordination with others, are evaluating areas to create suitable habitat in the lower section of the San Acacia Reach, especially in areas that experienced wildfires in recent years.

Additional Listing Information Provided by the Service

In 2016, the Service found that listing the Rio Grande chub and the Rio Grande sucker may be warranted. A Conservation Agreement was signed in September 2018 between the Service and the states of New Mexico, Colorado and Texas, the Jicarilla Apache Nation, the Pueblo of Santa Ana, several counties in Colorado, the U.S. Forest Service, Bureau of Land Management, and the National Park Service to reduce the threats to these fishes. In 2020, the

Service has stated that they will assign a project manager for the chub and sucker in 2022, will complete a Species Status Assessment in 2023, and will conduct a 12-month review in 2024.

The Service conducts photographic monitoring of the New Mexico meadow jumping mouse (jumping mouse) at BDANWR. In 2020, there were seven unique photo detections compared to ten photo detections in 2019. The Service states that the BDANWR experienced extreme drought conditions during the 2020 growing season but was able to maintain habitat through well pumping and coordination with the MRGCD.

International Boundary and Water Commission Activities

The IBWC provided a report of its activities along the Rio Grande in New Mexico and Texas during 2020 and their projected activities for 2021. The items discussed included their levee rehabilitation work and Federal Emergency Management Agency (FEMA) status. The Vado East Levee Rehabilitation Project documents were submitted to FEMA in 2018, and the Vado West Levee construction is scheduled to be completed in April 2020. The Sunland Park West Levee construction was awarded in September 2019, and the construction is scheduled to be completed in June 2021. The designs for East Levee sections are about 90 percent complete and construction will be awarded in 2021 and 2022. The IBWC also provided a list of the FEMA status for 12 levee projects which have been either submitted to FEMA, are pending design, in design, or pending construction.

Brief updates were also provided for the IBWC's ongoing channel maintenance projects. Construction projects include the American Canal Upper Reach which was completed in 2020, and the American Canal Lower Reach which is under redesign to be completed in 2022. Construction and mitigation work were completed for the Thurman arroyo sediment basins in January 2020.

IBWC presented updates to the status of the Canalization River Management Plan (RMP). The RMP covers floodplain management, endangered species management, and channel maintenance. The 2009 Record of Decision (ROD) for the IBWC expired in 2019 with release of the Final Report on the 10-year implementation. Therefore, the ROD commitments have been incorporated into the RMP. An Environmental Assessment was initiated in 2018 and delivered for public comment in 2019. Target update for the revised RMP will be late 2021.

The 2019 selected alternative will continue implementation of the RMP, designate up to 65 miles through the U.S. IBWC's right of way for the New Mexico Rio Grande Trail and Texas city and county trails, perform additional sediment removal in the channel, engage stakeholder participation, and establish partnerships to create up to 500 acres of habitat areas outside of IBWC jurisdiction.

In the 2009 ROD, the IBWC committed to implement 30 habitat restoration projects under the River Habitat Restoration Program. Currently, IBWC has implemented 22 habitat restoration sites, totaling over 500 acres. Under the River Habitat Restoration Program, IBWC treated over 500 acres of saltcedar, planted about 102,000 trees and 12,000 shrubs, and installed groundwater-monitoring wells. IBWC anticipates completing an Environmental Assessment for aquatic habitat restoration in the spring of 2020 and designs in summer of 2020.

Status updates were also provided for the Environmental Water Transaction Program which is also included under the 2009 ROD for the Canalization Project. Between 2014 and 2017 under the Environmental Water Transaction Program, IBWC acquired additional water rights for over 47 acres from EBID, irrigated 5 restoration sites, and conducted 31 irrigation events. In 2020, IBWC awarded a contract to conduct an appraisal of EBID surface water rights to acquire additional water rights to meet their commitments to meet the 2009 ROD obligations. They are currently working with several federal agencies to develop an interagency agreement allowing them to conduct review appraisals pursuant to federal appraisal regulations.

Under the 2017 Biological Opinion, IBWC is required to move vegetation from islands being removed that have known endangered species nesting or have suitable habitat. In 2018 and 2019, IBWC contractors successfully transplanted willows from islands in Sunland Park, Canutillo, Vinton, and Hatch to nearby restoration sites. In 2020, about 15,000 additional willows were transplanted at the Vado West mitigation site.

IBWC estimated that 450,000 to 490,000 cubic yards of silt is deposited into the Rio Grande Canalization Project reach annually. This results in sediment plugs, island formations, raised riverbeds, increased flooding risks, and inhibited irrigation return flows. The Canalization reach is defined as 105 river miles from Percha Dam to El Paso. Prior to 1990, IBWC removed 250,000 to 300,000 cubic yards of sediment per year. During 2019, IBWC removed over 422,000 cubic yards. In 2020, they were able to hire outside contractors to remove about

1,188,000 cubic yards. Plans for 2021 are to remove an additional 400,000 cubic yards of sediment.

In 2019, the IBWC began development of a new hydraulic model for three separate reaches between Percha Dam and American Dam. The modeling system will include both 1-dimensional, steady-state and 2-dimensional, unsteady-state HEC-RAS hydraulic models. The project will be 90 percent completed in April 2021, with a final completion date of June 18, 2021.

The IBWC provided an update on the border wall fences in the Compact reach showing the locations and different types of designs being used. Some locations are adjacent to the river. The wall is not considered to be impacting any of the IBWC operations, and all of the projects have been put on hold by the current administration to assess the need and impacts of the projects.

The IBWC reported deliveries for the Convention of 1906 to Mexico in 2020, which were 84 percent of a full allocation. The initial allocation for 2021 to Mexico is only 2,458 acre-feet based on the 200,177 acre-feet of Usable Water in storage.

ADDITIONAL NON-FEDERAL AGENCY UPDATES

In addition to the federal agency reports summarized above, on February 2, 2021, Santa Fe presented a summary of their water planning activities with an emphasis on potential impacts to SJCP water accounting. Specifically, Santa Fe presented a proposed SJCP return flow pipeline and two options enabled by the pipeline that would allow Santa Fe to fully utilize their allocation of SJCP water. Both options involve diversion and return flow operations of SJCP below Otowi gage. An initial review suggests that neither option will affect Compact accounting. However, a more detailed analysis will be done by the Engineer Advisers once the final proposal and permit are received from the New Mexico State Engineer.

ENGINEER ADVISER RECOMMENDATIONS

Reclamation has recently conducted surveys to develop new area-capacity tables for Elephant Butte Reservoir. These tables account for the sediment buildup within the reservoir

and the related loss of storage. They also are used to determine the current total storage volume of the reservoir. The Rio Grande Compact Rules and Regulations describe the now-outdated total storage volume in the reservoir. The Engineer Advisers recommend that the Commissioners direct the Legal Committee, in conjunction with the Engineer Advisers, to incorporate the new tables developed by Reclamation for Elephant Butte Reservoir into the Compact Rules and Regulations.

BUDGET

The Engineer Advisers reviewed the cost of operation for the year ending June 30, 2020 and the budget for the FY ending June 30, 2022.

The Engineer Advisers found that the expenses for gaging stations and administration of the Compact for the year ending June 30, 2020 were $203,868. The U.S. federal government bore $52,733 of this total, with the balance of $151,135 to be borne equally by the three states.

The Engineer Advisers found that the proposed budget for the FY ending June 30, 2022 indicates that a total of $223,929 will be spent for gaging and administration, with a proposed contribution by the U.S. federal government of $71,840.

Craig W. Cotten, P.E.

Engineer Adviser for Colorado

Page Pegram

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ADDENDA
OF THE ENGINEER ADVISERS

The following Addenda to the Engineer Adviser Report
were developed by and are the opinion of the authoring state.
They are not approved by the Rio Grande Compact Commission.

The Colorado Engineer Adviser's Addendum to the 2021 Engineer Advisers' Report

April 8, 2021

At the 2021 Rio Grande Compact Commission (RGCC) Engineer Advisers' meeting held via videoconference on March 1-5, 2021, the Engineer Advisers did not reach consensus on the 2020 Rio Grande Compact (Compact) Accounting. The lack of consensus stems from the continuing disagreement regarding Colorado and New Mexico Credit Water that Reclamation released in 2011, the appropriate accounting of 2011 Colorado and New Mexico deliveries that were affected by Reclamation's release beyond the available Usable Water, and the directly relevant 2006 direction of the RGCC to Reclamation. There was no release of credit water by Reclamation in 2020 and the Engineer Advisers did reach agreement on the accounting of the 2020 streamflow numbers for the Colorado and New Mexico gaging stations. However, because of the lack of agreement on the effects of the releases of credit water in previous years, the amount of the accrued credit of Colorado and of New Mexico could not be agreed upon or finalized for 2020. Additionally, the unauthorized release of Colorado and New Mexico credit water in 2011 has caused a disagreement regarding the dates of Article VII timing under the Compact in 2020.

Therefore, the Colorado Engineer Adviser presents for the Commission's consideration the following method of accounting for the 2020 calendar year Compact Accounting:

> Method 2: Colorado and New Mexico Credit Water was released during 2011, and accounted as being reduced in the month it was released, as in a relinquishment.

Method 2:

With this Method, the Credit Water will have been reduced for evaporation at the end of the calendar year – in accordance with Article VI of the Compact and the 2006 direction of the RGCC to Reclamation. The Colorado Engineer Adviser carried forward the end of 2019 accounting results for Method 2 used through the 2020 calendar year. This method complies with the last paragraph of Article VI of the Compact, wherein Credit Water in Elephant Butte Reservoir is "reduced annually to compensate for evaporation losses in the proportion that such credits (or debits) bore to the total amount of water…during the year."

Under this method, Reclamation released accrued Credit Water from Elephant Butte Reservoir during the summer of 2011 unilaterally and without the permission of Colorado or New Mexico. This unauthorized release coupled with normal compact accounting resulted in 2020 Accrued Credits for Colorado that are less than those calculated in the Texas accounting method (Method 1). Method 2 results in Colorado having an Accrued Credit for the end of year 2020 of 1,200 acre-feet.

The difference in Colorado's Compact compliance status between the Texas method and Method 2 (minus 100 acre-feet) illustrates the effect of Reclamation's 2011 release of Credit Water on Colorado Compact compliance carried forward through 2020. Unlike an authorized relinquishment, however, Colorado did not receive the Article VII benefit of being able to store a like amount of water to that released by Reclamation in 2011 in post-compact reservoirs in the future when Article VII of the Compact is in effect.

Utilizing Method 2 accounting, the date that Article VII restrictions were lifted in 2020 was June 19. Method 1 accounting has the Article VII restrictions being lifted on June 19 also.

Summary

The Colorado Engineer Adviser believes that the Texas method (Method 1) of accounting as put forth in the Texas addendum contravenes the last unnumbered paragraph of Article VI of the Compact and the unanimous direction of the Commission to Reclamation in 2006. Therefore, the Texas method is not acceptable to the Colorado Engineer Adviser.

No after-the-fact accounting can address the primary issues that occurred in 2011 when Reclamation made its unauthorized releases of accrued Credit Water, which are:

1) Colorado and New Mexico have sole authority to decide the disposition of any of their respective accrued Credit Water; and
2) Reclamation's actions denied Colorado and New Mexico the benefits associated with relinquishments or other negotiated solutions under the Compact and eliminated Texas' incentive to negotiate the terms of a relinquishment or other negotiated solution during drought times.

The method proposed above is a suggestion for the Commission's consideration. The Colorado Engineer Adviser recognizes that no accounting method may be approved without the unanimous approval of the Commission, and that any accounting method must not violate the express terms of the Compact.

New Mexico Addendum to the Engineer Advisers' Report to the Rio Grande Compact Commission

April 2021

At the 2021 Rio Grande Compact Commission (RGCC) Engineer Advisers' meeting, the Engineer Advisers again did not reach unanimous consensus on a method by which to finalize the Rio Grande Compact (Compact) Accounting. The lack of unanimous consensus stems from:

1) the continuing disagreement regarding New Mexico and Colorado Credit Water that Reclamation unilaterally released from Elephant Butte Reservoir in 2011 without authorization from either Colorado or New Mexico;
2) the appropriate accounting of New Mexico and Colorado deliveries from 2011 thru 2020 that were affected by Reclamation's unilateral and unauthorized 2011 Credit Water release;
3) Reclamation's disregard for Article VI in the Compact[1] and the 2006 direction of the RGCC to Reclamation regarding the accounting and release of accrued Credit Water; and
4) Reclamation's continued use of Method 1 accounting (see Method 1 accounting sheet) and the impacts on New Mexico of this accounting due to the differences in the timing and duration of the Article VII storage restriction on upstream reservoirs constructed after 1929.

Compact Accounting by Texas/Reclamation using Method 1, as compared to New Mexico's use of Method 2

The Texas Engineer Adviser conducted Compact accounting for the 2020 calendar year using a method (see Method 1 accounting sheets) that reduces Credit Water by subtracting evaporation losses on a monthly basis during the calendar year. This same method was put forward to the RGCC by Texas and Reclamation in 2012 and carried forward by them in subsequent years using the same accounting steps. At the start of calendar year 2020 using Method 1, Colorado had an Accrued Credit of 900 acre-feet, and New Mexico had an Accrued Debit of 34,300 acre-feet. At the beginning of calendar year 2021 using Method 1, Colorado had an Accrued Credit of 1,300 acre-feet and New Mexico had an Accrued Debit of 91,500 acre-feet. This method, however, is contrary to Article VI of the Compact for computing evaporation losses on both Credit and Debit water retained in storage and the 2006 direction of the RGCC to Reclamation. The New Mexico

[1] Pursuant to Article VI of the Compact, "all credits and debits of Colorado and New Mexico shall be computed for each calendar year" and "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."

Engineer Adviser has repeatedly apprised the RGCC that approval of Method 1 would require the RGCC to disregard the explicit language of the Compact requiring annual accounting for evaporation and is contradictory to the unanimous RGCC directive in 2006. Furthermore, the 2006 resolution cannot be unilaterally rescinded by a single state nor by an Engineer Adviser. Therefore, Method 1 is not acceptable to the New Mexico Engineer Adviser.

The New Mexico Engineer Adviser conducted Compact accounting for the 2020 calendar year using a method (referred to as Method 2, see accounting sheets) that was proposed by both the New Mexico and the Colorado Engineer Advisers in 2012 (see the 2012 New Mexico and Colorado joint addendum to the 2012 Engineer Adviser Report). Method 2 reduces Credit Water for evaporation at the end of the calendar year in accordance with Article VI of the Compact and the 2006 direction of the RGCC to Reclamation. The New Mexico Engineer Adviser carried forward the end of 2011 accounting results with Method 2 through the 2020 calendar year using the same accounting steps (See 2020 New Mexico Addendum). During the 2020 calendar year, Colorado carried an Accrued Credit of 800 acre-feet, and New Mexico carried an Accrued Debit of 38,800 acre-feet by Method 2. The New Mexico Engineer Adviser used these values as inputs for the 2020 Compact accounting. Consequently, the Compact compliance status for 2021, using Method 2, is 1,200 acre-feet of Accrued Credit for Colorado and 96,300 acre-feet of Accrued Debit, for New Mexico. Method 2 accounting sheets and associated tables are attached to this New Mexico 2020 addendum.

For calendar year 2020 the timing of Article VII storage restrictions occurred on June 19, 2020 for both Method 1 and Method 2 accounting, since only a small amount of Colorado Accrued Credit water was present in Elephant Butte Reservoir. No storage of native water occurred in New Mexico after June 19, 2020.

Article VII restriction timing issues that have occurred since Reclamation's 2011 unilateral and unauthorized release of credit water has impacted New Mexico and Colorado up-stream storage benefits as documented in addenda included in the annual report of the Engineer Advisers to the Rio Grande Compact Commission since 2011. For example, as documented in the 2017 New Mexico Addendum to the Engineer Adviser report, if Reclamation's 2011 release had been an authorized relinquishment done in accordance with the Compact, New Mexico and Colorado would have received the ability to store and release 33,825 acre-feet of water when the Article VII storage restriction is in effect. These benefits were denied by Reclamation's unauthorized release of credit water described above. Reclamation's refusal to use Method 2 accounting as directed by the RGCC to determine Usable Water in Rio Grande Project Storage also impacted El Vado Reservoir operations in 2015 and 2016.

Given the lack of resolution on the above issues and absent an explicit agreement by Reclamation to abide by Article VI of the Compact and the RGCC's 2006 directives regarding the accounting and release of Accrued Credit Water, the New Mexico Engineer Adviser again recommends that

the RGCC not approve any Compact accounting for 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, and 2020.

For calendar year 2020, New Mexico carried an Accrued Debit of 38,800 acre-feet, in accordance with the New Mexico Engineer Adviser's accounting methodology. Article VI of the Rio Grande Compact states in part that, "*New Mexico shall retain water in storage at all times to the extent of its accrued debit".* For New Mexico, retention of Accrued Debit water occurs in reservoirs constructed after 1929, between Lobatos and San Marcial, which are authorized to store native Rio Grande water. For calendar year 2020, retention of water for New Mexico's Accrued Debit occurred primarily in El Vado Reservoir. In El Vado Reservoir, 36,406 acre-feet were retained in the debit account, and in Santa Fe's Mclure and Nichols reservoir system, a total of 948 acre-feet were retained.

The Middle Rio Grande Conservancy District (MRGCD) made an emergency request to the Rio Grande Compact Commission, through the New Mexico Engineer Adviser, for release of accrued debit water retained in El Vado Reservoir via email on July 6, 2020. The emergency request was made due to extreme drought conditions to benefit endangered species in the middle valley of the Rio Grande as well as to assist middle valley irrigators. Based on that request, the New Mexico Commissioner sought and received responses from the Commissioners for Colorado and Texas. The Colorado Commissioner did not object to the request and the Texas Commissioner, consented to the request with conditions. The New Mexico Commissioner received those responses on July 16, 2020. On July 18, 2020, releases of the debit water commenced. A total of approximately 32,000 acre-feet of retained debit water were released from El Vado Reservoir between July 18, 2020 and September 7, 2020.

TABLE 12. EVAPORATION LOSS ON RIO GRANDE WATER STORED IN RESERVOIRS ABOVE OTOWI AND TOTAL RIO GRANDE STORAGE AT EL VADO AND ABIQUIU.

(Method 2, Calendar Year 2020)

(UNIT = ACRE-FEET)

TABLE 12. Evap abv Otowi MONTH	EL VADO AND ABIQUIU RIO GRANDE STORAGE	R.G. COMPACT DEBT WATER STORED IN EL VADO	LOSSES ON R.G. COMPACT DEBT WATER STORED IN EL VADO	LOSSES ON RIO GRANDE STORED IN EL VADO	LOSSES ON RIO GRANDE STORED IN ABIQUIU	OTOWI EVAPORATION ADJUSTMENT
	(1)	(2)	(3)	(4)	(5)	(6) = (4) + (5)
JANUARY	4678	0	0	0	0	0
FEBRUARY	8475	0	0	0	0	0
MARCH	14951	0	0	100	0	100
APRIL	35988	0	0	141	0	141
MAY	60759	0	0	460	0	460
JUNE	54558	36,164	251	394	0	394
JULY	44245	30,620	197	318	1	319
AUGUST	14175	8,014	25	95	-7	88
SEPTEMBER	3801	3,489	47	94	3	97
OCTOBER	3672	3,394	121	125	-3	122
NOVEMBER	3563	3,362	101	104	2	106
DECEMBER	3444	3,350	123	127	0	127
ANNUAL			865	1958	-4	1954

(1) SUM OF NATURAL STORAGE IN EL VADO AND ABIQUIU.

(2) AMOUNT OF DEBT WATER IN STORAGE IN EL VADO. TABLE DOES NOT REFLECT 948 AF OF DEBT WATER RETAINED IN SANTA FE RESERVOIRS WHICH WAS HELD CONSTANT DURING CALENDAR YEAR 2020 BY THE CITY OF SANTA FE.

(3) ACTUAL NET EVAPORATION LOSS TO DEBT WATER IN EL VADO EQUAL TO PERCENT DEBIT WATER TO TOTAL NATIVE TIMES NET LOSS. APPLIED ANNUALLY.

(4) ACTUAL NET EVAPORATION LOSS TO NATURAL POOL IN EL VADO.

(5) ACTUAL NET EVAPORATION LOSS TO NATURAL POOL IN ABIQUIU.

(6) SUM OF NET EVAPORATION LOSSES IN EL VADO AND ABIQUIU.

2020 Evaporation Loss On Rio Grande Compact Water Stored in Elephant Butte Reservoir

(Unit = Acre-Feet) Except Col. (8)

(New Mexico Accounting Method-2)

Month	Total Rio Grande Stored in Elephant Butte (Ac-Ft)	Total Net Evap on Rio Grande Stored in Elephant Butte (Ac-Ft)	Colorado's Rio Grande Compact Credit Water Stored in Elephant Butte (Ac-Ft)	Colorado's Credit Water Evaporation Adjustment (Ac-Ft)	New Mexico's Rio Grande Compact Credit Water Stored in Elephant Butte (Ac-Ft)	New Mexico's Credit Water Evaporation Adjustment (Ac-Ft)	Total Credit Water Evaporation Adjustment (Ac-Ft)	Total Rio Grande Usable Water Stored in Elephant Butte (Kaf)	Total Water Relinquished (Ac-Ft)	CO Credit Water Relinquished (Ac-Ft)	NM Credit Water Relinquished (Ac-Ft)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
BOY Credit (2020)			800		0				NA	NA	NA
January	577171	3462	800	5	0	0	5	576	0	0	0
February	609291	3511	800	5	0	0	5	608	0	0	0
March	552672	7848	800	11	0	0	11	552	0	0	0
April	500332	11704	800	18	0	0	18	500	0	0	0
May	402017	14114	800	27	0	0	27	401	0	0	0
June	285652	12129	800	31	0	0	31	285	0	0	0
July	175554	6764	800	27	0	0	27	175	0	0	0
August	108385	5522	800	34	0	0	34	108	0	0	0
September	82592	2971	800	23	0	0	23	82	0	0	0
October	87325	2958	800	21	0	0	21	87	0	0	0
November	100038	2226	800	13	0	0	13	99	0	0	0
December	127091	1361	800	6	0	0	6	126	0	0	0
Annual		74570		221		0	221		0	0	0

(8) = (1) - [(3) + (5)] Total usable Rio Grande water in Elephant Butte Reservoir.

Addendum to the 2021 Engineer Advisers' Report
Texas Engineer Adviser
April 8, 2021

The Engineer Advisers to the Rio Grande Compact Commission (Commission) were unable to reach agreement on the accounting of water deliveries for 2020 at the 2021 Engineer Advisers' meeting held on March 1-5, 2021, via videoconference. The issue centered on how the evaporation losses on Credit Water are calculated and tabulated and are carried forward from the 2011 and 2012 Water Accounting. Three separate accountings were developed in 2014 and labeled as Method 1, 2, and 3. At the 2016 Rio Grande Compact Commission meeting, Colorado noted they will no longer follow Method 3. The Texas Engineer Adviser proposes that Method 1 be accepted and thus bases Texas' calculations on that method.

The history of this issue is addressed in a memorandum from the Engineer Advisers to the Commission dated March 23, 2006 (the "Memorandum"). As described in the Memorandum, the Commission has been inconsistent in the way it has tabulated Credit Water in storage based on evaporation losses during the year. There are times when the Commission has approved an accounting where Credit Water is held constant each month and the Credit Water is only reduced at the end of the year (Method 3), even though the calculation of Credit Water evaporation is a summation of monthly evaporation amounts. Under this method, whenever Usable Water amounts become negative and Credit Water was released, those amounts were repaid immediately as inflows occur. Also, there are times when the Commission has approved the evaporation of Credit Water monthly (Method 1); that is, when Credit Water and Usable Water are subject to evaporation as it occurs. Under this method, the Texas Engineer Adviser understands that Usable Water is not negative.

As understood by the Texas Engineer Adviser, Method 2 holds the Credit Water constant throughout the year. If there is insufficient Usable Water in Elephant Butte to cover all the evaporation losses on the Credit Water, Usable Water has gone negative. Method 2 then assumes that the negative dip into the Credit Water can never be repaid. The Texas Engineer Adviser was unable to find any instance where this method had been approved by the Commission. The Texas Commissioner believes that the intent and spirit of the Memorandum has not been followed by New Mexico and Colorado. Accordingly, Texas rescinded its support and approval of the Memorandum.

The Engineer Advisers presented recommendations to the Commission on this issue in 2006. The Commission approved the following three recommendations that:

The Commission direct that accrued Credit Water be held constant during the year.

The Commission direct the Engineer Advisers to meet if the total combined accrued Credit Water exceeds 150,000 acre-feet and Usable Water is less than a full allocation, or if the combined accrued Credit Water exceeds 50% of Project Storage, and to make a

recommendation to the Commission regarding optimum use of water in Project Storage for Commission approval.

The Commission direct Reclamation to allocate or release Credit Water only as directed by the Commission.

The Engineer Advisers have not agreed on a recommendation, and the Commission has not approved a proposal to optimize the use of water in Project Storage. Therefore, since one of the methods historically used by the Commission was to tabulate evaporation of Credit Water on a monthly basis, Reclamation proceeded with this historical practice and allocated the monthly tabulated evaporation of Credit Water to Usable Water.

For calendar year 2020, New Mexico carried an Accrued Debit of 38,800 acre-feet according to accounting Method 2, the New Mexico Engineer Adviser's accounting methodology. Based on New Mexico's interpretation of Article VI of the Rio Grande Compact, without consensus or agreement of the Texas and Colorado Commissioners, New Mexico retained water, attributed to its Accrued Debit, of 36,406 acre-feet in El Vado Reservoir and 948 acre-feet in Santa Fe's McClure and Nichols reservoir system.

Due to the extreme drought conditions in the middle Rio Grande, the New Mexico Commissioner requested that the Commission provide emergency authorization to release the retained Debit Water in the attached letter dated July 14, 2020. On July 16, 2020, the Texas Commissioner consented to the emergency release in order to prevent impacts to the silvery minnow and catastrophic economic losses in the middle Rio Grande. He also requested certain conditions to ensure the maximum efficiency of the releases, as shown in the attached letter from Commissioner Gordon. The Colorado Commissioner acknowledged that Colorado, Texas, and New Mexico did not agree on certain aspects of the application of Article VI to the status of stored water when considering Accrued Debits but did not object to the release. The New Mexico Commissioner then issued a State Engineer Order on July 17, 2020, which contained requirements consistent with the conditions specified by the Texas Commissioner. On July 18, 2020, releases of the Debit Water commenced. A total of approximately 32,000 acre-feet of retained Debit water were released from El Vado Reservoir between July 18, 2020 and September 7, 2020. The Middle Rio Grande Conservancy District pledged to work with the New Mexico Commissioner during the 2021 spring runoff to develop an operations plan that will delay the start of their irrigation season and optimize deliveries to Elephant Butte Reservoir to decrease the Accrued Debit caused by the 2020 emergency release.

An additional accounting concern for Texas involves the Bonita Lateral. Texas does not believe that any water taken from Elephant Butte Reservoir and Caballo Reservoir for the Bonita Lateral (Bonita Water) is a delivery of Compact water to Texas. The Bonita Water is delivered to lands outside the Rio Grande Project. Texas believes that the historical method of Compact accounting, where Bonita Water is added to the usable release, is wrong and that the methodology is double counting the Bonita Water. Texas has requested an explanation for the Bonita Water from Reclamation and has not received enough information which would settle this issue. Texas believes that under the Compact, the accounting for deliveries of water to the Rio

Grande Project should be accurate. This would require an official explanation for the Bonita Lateral and why Compact waters, which are counted as deliveries to Texas, can be diverted by Reclamation for non-project users. Texas is ready to discuss this following receipt of an official response from Reclamation and looks forward to resolving this issue.

2020 RIO GRANDE PROJECT OPERATIONS

The Texas Commissioner was contacted by the El Paso County Water Improvement District No. 1 (EPCWID) and the Elephant Butte Irrigation District (EBID) with their concerns regarding the Rio Grande Project Operations section of the 2021 Engineer Advisers' Report which includes language and numbers from the draft Bureau of Reclamation Report provided at the Engineer Advisers' meeting in early March. Because the Engineer Advisers' Report does not reflect the final operations of the Rio Grande Project, the letters which were provided by EPCWID and EBID with their comments are included as attachments to the Minutes for the 2021 Annual Meeting.

To ensure that the Rio Grande Project Operations are recorded properly for the calendar year 2020 Engineer Advisers' Report, the following table contains the final 2020 allocation, charges, Mexico's adjustments, and end-of-year amounts for the Rio Grande Project as of May 26, 2021:

Entity	Allocation	Charge	Mexico Adjustment	EOY Balance
EBID	202,021	(198,492)	(239)	3,291
EPCWID	367,787	(276,820)	(6,155)	84,812
Mexico	50,362	(50,362)	NA	NA
Total	613,777	(525,674)	(6,394)	88,103

COMPACT ACCOUNTING 2020 - METHOD 1

The Texas Engineer Adviser has reviewed the streamflow and reservoir storage records and other pertinent data for calendar year 2020. This method, recommended by the Texas Engineer Adviser, reduces the Credit Water evaporation monthly. The scheduled and actual deliveries, release of Usable Water for the year 2020, and balances as of January 1, 2021, are as follows:

(a) Deliveries by Colorado at the State Line:

Balance as of January 1, 2020	900 acre-feet
Scheduled delivery	121,100 acre-feet
Actual delivery at Lobatos plus 10,000 acre-feet	121,700 acre-feet
Reduction of credits on account of evaporation	200 acre-feet
Accrued credit January 1, 2021	1,300 acre-feet

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

Balance as of January 1, 2020	34,300 acre-feet
Scheduled delivery	241,300 acre-feet
Actual delivery	182,900 acre-feet
Reduction of debits on account of evaporation	1,200 acre-feet
Accrued debit January 1, 2021	91,500 acre-feet

(c) Project Storage and Releases:

Accrued departure (credit) as of January 1, 2020	2,465,800 acre-feet
Actual release of Usable Water	594,200 acre-feet
Normal release for year	790,000 acre-feet
Accrued departure (credit) as of January 1, 2021	2,615,800 acre-feet
Under-release capped at 150,000 acre-feet	

RIO GRANDE COMPACT COMMISSION

COLORADO TEXAS NEW MEXICO

CONCHA ORTIZ Y PINO BUILDING, 130 SOUTH CAPITOL, SANTA FE, NM 87501
TELEPHONE: (505) 827-6091 FAX: (505) 827-3806

JOHN R. D'ANTONIO JR., P.E.
STATE ENGINEER
NM RIO GRANDE COMPACT COMMISSIONER

Mailing Address:
P.O. Box 25102
Santa Fe, NM 87504-5102

July 14, 2020

Kevin Rein
Rio Grande Compact Commissioner
Colorado Division of Water Resources
1313Sherman St., Room 818
Denver, CO 80203
Kevin.rein@state.co.us

Patrick Gordon
Rio Grande Compact Commissioner
State of Texas
4594 N. Mesa, Suite 100
El Paso, TX 79912
pgordon@eplawyers.com

Via email and U.S First Class Mail

RE: **Request For Emergency Release of Approximately 38,000 acre-feet of Water New Mexico Retained Pursuant to Article VI of the Rio Grande Compact**

Dear Commissioner's Gordon and Rein:

On Monday July 6, 2020 the Rio Grande Compact Engineer Adviser and Legal Advisor reached out via email to their respective counterparts in Texas and Colorado, requesting they consult with their Commissioners and Legal Advisors to consider an emergency release of approximately 38,000 acre-feet of water New Mexico has retained in storage to the extent of New Mexico's current debit in accordance with Article VI of the Rio Grande Compact.

This water is needed on or before Friday, July 17, 2020 in order to sustain flow in the river to maintain critical habitat for listed endangered species pursuant to the terms of the 2016 Final Biological Opinion for Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande. We expect extensive drying in the middle Rio Grande in the upcoming weeks, which may cause significant damage to the Rio Grande silvery minnow population. Release of this debit water would provide an approximately 60-day supply of a minimum amount of water to help minnow survival. I am aware that this water will most likely not reach Elephant Butte Reservoir

and will not contribute to New Mexico's accrued delivery and could put New Mexico in further accrued debit next year.

Because of the urgency of the situation, please provide your written response by noon Thursday, July 16, 2020. Given the current Covid-19 restrictions in place in each state, we propose that the Commission's decision be memorialized at the next Compact Commission meeting. If you have any questions regarding the request, please do not hesitate to contact me directly. Thank you.

Sincerely,

John R. D'Antonio Jr., P.E.
New Mexico Rio Grande Compact Commissioner

JRD/kme

cc: Hal Simpson, Federal Chairman, R. G. Compact Commission
Page Pegram, NM Engineer Adviser

RIO GRANDE COMPACT COMMISSION

PATRICK R. GORDON
TEXAS COMMISSIONER

401 E. FRANKLIN AVE., STE 560
EL PASO, TEXAS 79901-1212
TELEPHONE: (915) 834-7075
FAX : (915) 834-7080

July 16, 2020

By Email: john.dantonio@state.nm.us

John R. D'Antonio Jr. P.E.
New Mexico State Engineer
Rio Grande Compact Commissioner
Concha Ortiz Y Pino Building
130 South Capital
Santa Fe, New Mexico 87501

Re: Request for emergency release of 38,000 acre feet of stored debit water held for Texas under Article VI of the Rio Grande Compact ("Compact")

Dear John:

This letter responds to your request to approve an emergency release of approximately 38,000 acre-feet of stored debit water retained by New Mexico in El Vado Reservoir under the Compact.

While Texas is not responsible for the silvery minnow, Texas understands that without the emergency releases of the stored debit water held for Texas in El Vado and other upstream reservoirs, the silvery minnow survival would be seriously impacted, possibly putting the Biological Opinion requirements in jeopardy. In addition, without the requested releases, New Mexico farmers in the middle Rio Grande would suffer extreme hardships and crop losses. Texas also understands that once released, this water is under control of New Mexico, so the State's cooperation is necessary to optimize the releases for these purposes.

Texas consents to your request for the release of stored debit water subject to the following conditions:

- only water that is necessary for purposes of saving the silvery minnow and assisting the farmers be released, and the water is conserved to the extent possible;

- irrigation diversions are taken as far downstream as possible to allow water to stay in the river further downstream to protect the silvery minor and other wildlife;

- water is released only during dry periods, such that if the drought recedes and runoff occurs during this time period, the releases would stop to retain the debit water in the upstream reservoir for later release to Texas;

- irrigation return flows and drainage are directed back into the river to assist with the silvery minnow survival;

- any other water (such as San Juan-Chama water) that may become available is used first and/or to augment the debit releases; and

- any unreleased debit water will be available for release under Article VIII of the Compact in 2021.

As stated in Commissioner Rein's letter dated July 16, 2020, the releases and actions in this matter are not a concession of any position taken by the respective states regarding Article VI issues.

Sincerely,

Pat Gordon

Pat Gordon
Texas Rio Grande Compact
Commissioner

Method 1: Reduce Credit Water for Evaporation Monthly during the 2020 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE

YEAR 2020 - Method 1

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[d]	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
	--------	--------	--------	--------	12.5	--------	--------	--------	--------	0.0	--------	0.5	--------	--------	--------	--------	--------	0.0	--------	--------	--------	0.0
JAN	3.4	--------	--------	3.4	12.4	-0.1		-0.1	3.3	3.3	9.8	0.5	0.0			0.0	9.8	9.8	3.6	11.2	14.8	14.8
FEB	2.7	--------	--------	2.7	12.2	-0.2		-0.2	2.5	5.8	10.4	0.5	0.0			0.0	10.4	20.2	4.0	14.1	18.1	32.9
MAR	4.1	--------	--------	4.1	12.4	0.2		0.2	4.3	10.1	16.1	0.5	0.0			0.0	16.1	36.3	5.4	18.7	24.1	57.0
APR	10.5	7.5	1.4	19.4	12.5	0.1		0.1	19.5	29.6	35.2	0.5	0.0			0.0	35.2	71.5	2.8	5.5	8.3	65.3
MAY	57.0	17.9	1.0	75.9	13.6	1.1	0.1	1.2	77.1	106.7	145.4	0.5	0.0			0.0	145.4	216.9	2.7	9.9	12.6	77.9
JUN	24.2	2.5	0.1	26.8	13.1	-0.5	0.2	-0.3	26.5	133.2	77.2	0.5	0.0			0.0	77.2	294.1	0.3	7.4	7.7	85.6
JUL	10.9	1.0	0.0	11.9	9.9	-3.2	0.1	-3.1	8.8	142.0	23.4	0.5	0.0	-1.1	0.3	-0.8	22.6	316.7	0.0	2.2	2.2	87.8
AUG	5.9	0.7	0.0	6.6	8.6	-1.3	0.1	-1.2	5.4	147.4	13.4	0.5	0.0			0.0	13.4	330.1	0.0	1.0	1.0	88.8
SEPT	5.9	1.2	0.0	7.1	8.4	-0.2	0.1	-0.1	7.0	154.4	13.2	0.5	0.0			0.0	13.2	343.3	0.0	0.5	0.5	89.3
OCT	3.9	0.8	0.1	4.8	7.8	-0.6	0.1	-0.5	4.3	158.7	11.8	0.5	0.0			0.0	11.8	355.1	0.0	1.0	1.0	90.3
NOV	4.9	--------	--------	4.9	8.1	0.3	0.0	0.3	5.2	163.9	12.0	0.5	0.0			0.0	12.0	367.1	3.1	5.7	8.8	99.1
DEC	3.4	--------	--------	3.4	8.3	0.2	0.0	0.2	3.6	167.5	9.3	0.5	0.0			0.0	9.3	376.4	2.9	9.7	12.6	111.7
YEAR	136.8	31.6	2.6	171.0	--------	-4.2	0.7	-3.5	167.5	--------	377.2	--------	0.0	-1.1	0.3	-0.8	376.4	--------	24.8	86.9	111.7	--------

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

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

[b] 1,383 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

[c] Reduction of credits for evaporation calculated on a monthly basis.

[d] 488 ac-ft relinquishment credit stored in 2020. Storage of relinquished credit to date has totaled 2,556 acre-feet; balance remaining is 444 acre-feet.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	---------	---------	Cr. 0.9
C2	Scheduled Delivery from Conejos River	28.8	---------	Dr. 27.9
C3	Scheduled Delivery from Rio Grande	92.3	---------	Dr. 120.2
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet	---------	121.7	Cr. 1.5
C5	Reduction of Debits a/c Evaporation	---------		
C6	Reduction of Credits a/c Evaporation[c]	0.2	---------	Cr. 1.3
C7				
C8	Balance at End of Year	---------	---------	Cr. 1.3

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 1: Reduce Credit Water for Evaporation Monthly during the 2020 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2020 - Method 1

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]	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]	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[b]	During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	--------	0.9	--------	--------	--------	--------	--------	--------	--------	1.5	557.1	--------	--------	--------	--------
JAN	41.1	4.7	3.8	0.0		-3.4	0.4	41.5	41.5	3.7	577.2	20.1	0.0	20.1	20.1
FEB	43.4	8.5	3.8	0.0		-2.4	1.4	44.8	86.3	9.8	609.3	32.1	1.0	33.1	53.2
MAR	53.2	15.0	6.5	0.1		-2.6	4.0	57.2	143.5	15.4	552.7	-56.6	94.8	38.2	91.4
APR	49.8	36.0	21.0	0.2		-8.7	12.5	62.3	205.8	38.3	500.3	-52.4	65.8	13.4	104.8
MAY	63.1	60.8	24.8	0.5		-7.5	17.8	80.9	286.7	63.6	402.0	-98.3	102.7	4.4	109.2
JUN	64.2	54.6	-6.2	0.4		-34.6	-40.4	23.8	310.5	57.2	285.7	-116.3	118.5	2.2	111.4
JUL	51.1	44.2	-10.4	0.3		-27.2	-37.3	13.8	324.3	46.6	175.6	-110.1	123.2	13.1	124.5
AUG	47.4	14.2	-30.0	0.1		-6.5	-36.4	11.0	335.3	16.3	108.4	-67.2	75.2	8.0	132.5
SEPT	35.0	3.8	-10.4	0.1		-11.0	-21.3	13.7	349.0	5.5	82.6	-25.8	31.6	5.8	138.3
OCT	19.2	3.7	-0.1	0.1		-3.9	-3.9	15.3	364.3	5.6	87.3	4.7	0.1	4.8	143.1
NOV	27.9	3.6	-0.1	0.1		-0.2	-0.2	27.7	392.0	5.8	100.0	12.7	0.0	12.7	155.8
DEC	31.6	3.4	-0.2	0.1		-0.6	-0.7	30.9	422.9	4.6	127.1	27.1	0.0	27.1	182.9
YEAR	527.0	--------	2.5	2.0		-108.6	-104.1	422.9	--------	--------	--------	-430.0	612.9	182.9	--------

Remarks: Cols. 3, 11, and 12 do not include transmountain water. Column 12 reflects implementation of revised area-capacity tables for Elephant Butte Reservoir, effective Jan. 1, 2020.

[a] In 2020, no relinquishment credit under previous relinquishment agreements was stored in New Mexico reservoirs. Storage of relinquished credit to date has totaled 288,728 acre-feet; balance remaining is 91,772 acre-feet.

[b] Reduction of credits for evaporation calculated on a monthly basis.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	---------	---------	Dr. 34.3
NM2	Scheduled Delivery at Elephant Butte	241.3	---------	Dr. 275.6
NM3	Actual Elephant Butte Effective Supply	---------	182.9	Dr. 92.7
NM4	Reduction of Debits a/c Evaporation		1.2	Dr. 91.5
NM5	Reduction of Credits a/c Evaporation and Spill[b]	0.0	---------	Dr. 91.5
NM6			---------	
NM7				
NM8	Balance at End of Year	---------	---------	Dr. 91.5

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

2020 STORAGE IN RESERVOIRS IN NEW MEXICO

ACRE-FEET

RESERVOIR	*ITEM*	*2019 DEC*	*2020 JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUNE*	*JULY*	*AUG*	*SEPT*	*OCT*	*NOV*	*2020 DEC*
ABOVE OTOWI BRIDGE														
EL VADO	TOTAL	32,109	30,200	28,400	28,471	42,881	61,858	57,797	45,291	31,307	30,974	25,859	23,121	20,105
	TRANS-MTN	(31,718)	(25,463)	(19,683)	(13,579)	(6,891)	(1,092)	(3,232)	(1,178)	(17,228)	(27,394)	(22,377)	(19,672)	(16,668)
ABIQUIU	TOTAL	81,921	83,969	86,722	89,866	87,905	90,058	70,492	53,760	51,762	61,864	61,821	63,873	66,435
	TRANS-MTN	(79,453)	(82,043)	(84,978)	(87,822)	(85,917)	(88,060)	(68,475)	(51,591)	(49,603)	(59,557)	(59,545)	(61,672)	(64,341)
	ACC. SED	(1,985)	(1,985)	(1,986)	(1,986)	(1,990)	(2,006)	(2,024)	(2,038)	(2,063)	(2,086)	(2,086)	(2,086)	(2,087)
SUBTOTAL RIO GRANDE		874	4,678	8,475	14,950	35,988	60,758	54,558	44,244	14,175	3,801	3,672	3,564	3,444
OTOWI BRIDGE TO SAN MARCIAL														
McCLURE	TOTAL	833	855	868	1,251	1,785	2,564	2,276	1,810	1,349	951	800	734	713
	PRE-COMP	(46)	(68)	(82)	(464)	(273)	(77)	0	0	0	0	0	0	0
	TRANS-MTN	0	0	0	0	0	0	0	0	0	0	0	0	0
NICHOLS	TOTAL	339	309	372	527	466	487	496	497	498	504	501	419	346
	PRE-COMP	(261)	(231)	(294)	(449)	(273)	(77)	0	0	0	0	0	0	0
	TRANS-MTN	(78)	(78)	(78)	(78)	(78)	(78)	0	0	0	0	0	0	0
COCHITI	TOTAL	47,383	43,062	46,044	45,143	45,864	44,613	44,045	43,691	43,482	43,152	43,129	43,413	42,381
	TRANS-MTN	(44,067)	(44,860)	(45,515)	(45,506)	(45,134)	(44,582)	(44,085)	(43,568)	(43,084)	(42,751)	(42,416)	(42,240)	(42,158)
	ACC. SED	(3,448)	(6)	(12)	(21)	(29)	(44)	(52)	(75)	(94)	(108)	(109)	(112)	(116)
GALISTEO	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
JEMEZ	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
	TRANS-MTN	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACC.SED.[1]	0	0	0	0	0	0	0	0	0	0	0	0	0
ACOMITA	TOTAL[2]													
SEAMA	TOTAL[3]													
SUBTOTAL RIO GRANDE		655	(1,017)	1,303	403	2,328	2,806	2,680	2,355	2,151	1,748	1,905	2,214	1,166
NEW MEXICO														
TOTAL RIO GRANDE		1,529	3,661	9,778	15,353	38,316	63,564	57,238	46,599	16,326	5,549	5,577	5,778	4,610

[1] accumulated sediment (312 acre-feet) omitted from the accounting while Jemez Reservoir is dry by decision of the Engineer Advisers, March 4, 2005

[2] storage omitted from accounting by action of the Commission on March 23, 2000

[3] no data available

Method 1: Reduce Credit Water for Evaporation Monthly during the 2020 Calendar Year - Developed by Texas and Reclamation

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE
YEAR 2020 - Method 1

Quantities in thousands of acre feet to nearest hundred

MONTH	Total Project Storage Capacity Available at End of Month[a]	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							
														SPILL FROM STORAGE			USABLE RELEASE	
		Elephant Butte Reservoir	Caballo Reservoir	Total at End of Month		Colorado Credit Water[c]	New Mexico Credit Water[c]	Total at End of Month			Measured Flow at Caballo Gaging Station	Intervening Diversions to Canals	Total Release and Spill	Caballo Flood Water	Credit Water	Usable Water	Net During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	---	---	---	---	---	0.9[b]	0.0[b]	0.9[b]		---	---	---	---	---	---	---	---	---
JAN	2,210.4	576.3	34.3	610.6	1,599.8	0.9	0.0	0.9		611.5	0.0	0.0	0.0				0.0	0.0
FEB	2,210.4	608.4	36.4	644.8	1,565.6	0.9	0.0	0.9		645.7	0.0	0.0	0.0				0.0	0.0
MAR	2,210.4	551.8	78.8	630.6	1,579.8	0.9	0.0	0.9		631.5	42.1	0.2	42.3				42.3	42.3
APR	2,185.4	499.4	73.5	572.9	1,612.5	0.9	0.0	0.9		573.8	66.0	0.1	66.1				66.1	108.4
MAY	2,185.4	401.2	77.4	478.6	1,706.8	0.8	0.0	0.8		479.4	90.7	0.1	90.8				90.8	199.2
JUN	2,185.4	284.9	63.0	347.9	1,837.5	0.8	0.0	0.8		348.7	130.8	0.2	131.0				131.0	330.2
JUL	2,185.4	174.8	59.6	234.4	1,951.0	0.8	0.0	0.8		235.2	125.3	0.2	125.5				125.5	455.7
AUG	2,185.4	107.7	32.8	140.5	2,044.9	0.7	0.0	0.7		141.2	101.0	0.2	101.2				101.2	556.9
SEPT	2,185.4	81.9	27.8	109.7	2,075.7	0.7	0.0	0.7		110.4	37.1	0.1	37.2				37.2	594.1
OCT	2,210.4	86.6	28.4	115.0	2,095.4	0.7	0.0	0.7		115.7	0.1	0.0	0.1				0.1	594.2
NOV	2,210.4	99.3	28.8	128.1	2,082.3	0.7	0.0	0.7		128.8	0.0	0.0	-				0.0	594.2
DEC	2,210.4	126.4	29.4	155.8	2,054.6	0.7	0.0	0.7		156.5	0.0	0.0	-				0.0	594.2
YEAR	---	---	---	---	---	---	---	---	---	---	593.1	1.1	594.2	0.0	0.0	0.0	594.2	---

Remarks: Cols. 2, 6 and 11 reflect implementation of revised area-capacity tables from Elephant Butte (2017 and 2019) and Caballo (2017) Reservoirs, effective for Compact accounting purposes Jan 1, 2020.

[a] Total Project Storage Capacity is 2,185,400 acre-feet (April through September) and 2,210,400 acre-feet (October through March) which accounts for flood control storage reservation at Caballo Reservoir of 100,000 acre-feet and at Elephant Butte Reservoir of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March. Total capacity of Elephant Butte Reservoir for spill purposes is 1,960,900 acre-feet (April through September) and 1,985,900 acre-feet (October through March). See Engineer Advisers' Report for the 2020 calendar year for explanation of corrections to columns 2 and 6.

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

[c] Calculated on a monthly basis.

ACCRUED DEPARTURE FROM NORMAL RELEASE

	ITEM	DEBIT	CREDIT	BALANCE
P1	Accrued Departure at Beginning of Year	---	---	Cr. 2465.8
P2	Actual Release during Year	594.2	---	Cr. 1871.6
P3	Normal Release for Year	---	790.0	Cr. 2661.6
P4	Under Release in Excess of 150.0	45.8	---	Cr. 2615.8
P5		---		
P6				
P7	Accrued Departure at End of Year	---	---	Cr. 2615.8

TIME OF HYPOTHETICAL SPILL Did not occur

APPROVED:
Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 2: Reduce Credit Water for Evaporation at the End of the 2020 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - DELIVERIES BY COLORADO AT STATE LINE

YEAR 2020 - Method 2

Quantities in thousands of acre feet to nearest hundred

	CONEJOS INDEX SUPPLY										RIO GRANDE INDEX SUPPLY								DELIVERIES			
	MEASURED FLOW				ADJUSTMENTS				SUPPLY			ADJUSTMENTS					SUPPLY					
MONTH	CONEJOS AT MOGOTE	LOS PINOS NEAR ORTIZ	SAN ANTONIO AT ORTIZ	TOTAL	STORAGE AT END OF MONTH[d]	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
	--------	--------	--------	--------	12.5	--------	--------	--------	--------	0.0	--------	0.5	--------	--------	--------	--------	--------	0.0	--------	--------	--------	0.0
JAN	3.4	--------	--------	3.4	12.4	-0.1		-0.1	3.3	3.3	9.8	0.5	0.0			0.0	9.8	9.8	3.6	11.2	14.8	14.8
FEB	2.7	--------	--------	2.7	12.2	-0.2		-0.2	2.5	5.8	10.4	0.5	0.0			0.0	10.4	20.2	4.0	14.1	18.1	32.9
MAR	4.1	--------	--------	4.1	12.4	0.2		0.2	4.3	10.1	16.1	0.5	0.0			0.0	16.1	36.3	5.4	18.7	24.1	57.0
APR	10.5	7.5	1.4	19.4	12.5	0.1		0.1	19.5	29.6	35.2	0.5	0.0			0.0	35.2	71.5	2.8	5.5	8.3	65.3
MAY	57.0	17.9	1.0	75.9	13.6	1.1	0.1	1.2	77.1	106.7	145.4	0.5	0.0			0.0	145.4	216.9	2.7	9.9	12.6	77.9
JUN	24.2	2.5	0.1	26.8	13.1	-0.5	0.2	-0.3	26.5	133.2	77.2	0.5	0.0			0.0	77.2	294.1	0.3	7.4	7.7	85.6
JUL	10.9	1.0	0.0	11.9	9.9	-3.2	0.1	-3.1	8.8	142.0	23.4	0.5	0.0	-1.1	0.3	-0.8	22.6	316.7	0.0	2.2	2.2	87.8
AUG	5.9	0.7	0.0	6.6	8.6	-1.3	0.1	-1.2	5.4	147.4	13.4	0.5	0.0			0.0	13.4	330.1	0.0	1.0	1.0	88.8
SEPT	5.9	1.2	0.0	7.1	8.4	-0.2	0.1	-0.1	7.0	154.4	13.2	0.5	0.0			0.0	13.2	343.3	0.0	0.5	0.5	89.3
OCT	3.9	0.8	0.1	4.8	7.8	-0.6	0.1	-0.5	4.3	158.7	11.8	0.5	0.0			0.0	11.8	355.1	0.0	1.0	1.0	90.3
NOV	4.9	--------	--------	4.9	8.1	0.3	0.0	0.3	5.2	163.9	12.0	0.5	0.0			0.0	12.0	367.1	3.1	5.7	8.8	99.1
DEC	3.4	--------	--------	3.4	8.3	0.2	0.0	0.2	3.6	167.5	9.3	0.5	0.0			0.0	9.3	376.4	2.9	9.7	12.6	111.7
YEAR	136.8	31.6	2.6	171.0	--------	-4.2	0.7	-3.5	167.5	--------	377.2	--------	0.0	-1.1	0.3	-0.8	376.4	--------	24.8	86.9	111.7	--------

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

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

[b] 1,383 ac-ft minus 243 ac-ft pre-compact; report of the Engineer Adviser for Colorado.

[c] Evaporation of credit water accounted as described in Article VI of the Rio Grande Compact.

[d] 488 ac-ft of relinquishment credit stored in 2020. Storage of relinquished credit to date has totaled 2,556 acre-feet; balance remaining is 444 acre-feet.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	---------	---------	Cr. 0.8
C2	Scheduled Delivery from Conejos River	28.8	---------	Dr. 28.0
C3	Scheduled Delivery from Rio Grande	92.3	---------	Dr. 120.3
C4	Actual Delivery at Lobatos plus 10,000 Acre Feet	---------	121.7	Cr. 1.4
C5	Reduction of Debits a/c Evaporation	---------		
C6	Reduction of Credits a/c Evaporation[c]	0.2	---------	Cr. 1.2
C7				
C8	Balance at End of Year	---------	---------	Cr. 1.2

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

Method 2: Reduce Credit Water for Evaporation at the End of the 2020 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - DELIVERIES BY NEW MEXICO AT ELEPHANT BUTTE

YEAR 2020 - Method 2

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]	ELEPHANT BUTTE EFFECTIVE SUPPLY				
	Recorded Flow at Otowi Bridge	ADJUSTMENTS						INDEX SUPPLY			STORAGE IN ELEPHANT BUTTE RESERVOIR		Recorded Flow Below Elephant Butte Dam[b]	Effective Supply	
		RESERVOIRS: LOBATOS TO OTOWI			Other Adjustments	Trans-mountain Diversions	Net Adjustments	During Month	Accumulated Total		End of Month[a]	Change Gain (+) Loss (-)		During Month	Accumulated Total
		Storage End of Month[a]	Change in Storage	Reservoir Evaporation											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	--------	0.9	--------	--------	--------	--------	--------	--------	--------	1.5	557.1	--------	--------	--------	--------
JAN	41.1	4.7	3.8	0.0		-3.4	0.4	41.5	41.5	3.7	577.2	20.1	0.0	20.1	20.1
FEB	43.4	8.5	3.8	0.0		-2.4	1.4	44.8	86.3	9.8	609.3	32.1	1.0	33.1	53.2
MAR	53.2	15.0	6.5	0.1		-2.6	4.0	57.2	143.5	15.4	552.7	-56.6	94.8	38.2	91.4
APR	49.8	36.0	21.0	0.2		-8.7	12.5	62.3	205.8	38.3	500.3	-52.4	65.8	13.4	104.8
MAY	63.1	60.8	24.8	0.5		-7.5	17.8	80.9	286.7	63.6	402.0	-98.3	102.7	4.4	109.2
JUN	64.2	54.6	-6.2	0.4		-34.6	-40.4	23.8	310.5	57.2	285.7	-116.3	118.5	2.2	111.4
JUL	51.1	44.2	-10.4	0.3		-27.2	-37.3	13.8	324.3	46.6	175.6	-110.1	123.2	13.1	124.5
AUG	47.4	14.2	-30.0	0.1		-6.5	-36.4	11.0	335.3	16.3	108.4	-67.2	75.2	8.0	132.5
SEPT	35.0	3.8	-10.4	0.1		-11.0	-21.3	13.7	349.0	5.5	82.6	-25.8	31.6	5.8	138.3
OCT	19.2	3.7	-0.1	0.1		-3.9	-3.9	15.3	364.3	5.6	87.3	4.7	0.1	4.8	143.1
NOV	27.9	3.6	-0.1	0.1		-0.2	-0.2	27.7	392.0	5.8	100.0	12.7	0.0	12.7	155.8
DEC	31.6	3.4	-0.2	0.1		-0.6	-0.7	30.9	422.9	4.6	127.1	27.1	0.0	27.1	182.9
YEAR	527.0	--------	2.5	2.0		-108.6	-104.1	422.9	--------	--------	--------	-430.0	612.9	182.9	--------

Remarks: Cols. 3, 11, and 12 do not include transmountain water. Column 12 reflects implementation of revised area-capacity tables for Elephant Butte Reservoir, effective Jan. 1, 2020.

[a] Note: In 2020, no relinquishment credit under previous relinquishment agreements was stored in New Mexico reservoirs. Storage of relinquished credit to date has totaled 288,728 acre-feet; balance remaining is 91,772 acre-feet.

[b] Evaporation of credit water accounted as described in Article VI of the Rio Grande Compact. NM 4, evaporation loss on Debit Water Retained in El Vado = Net Loss on RG in storage x Debit in storage/avg RG content

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	---------	---------	Dr. 38.8
NM2	Scheduled Delivery at Elephant Butte	241.3	---------	Dr. 280.1
NM3	Actual Elephant Butte Effective Supply	---------	182.9	Dr. 97.2
NM4	Reduction of Debits a/c Evaporation	---------	0.9	Dr.96.3
NM5	Reduction of Credits a/c Evaporation and Spill[b]	0.0	---------	Dr.96.3
NM6			---------	
NM7				
NM8	Balance at End of Year	---------	---------	Dr.96.3

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

2020 STORAGE IN RESERVOIRS IN NEW MEXICO

New Mexico Accounting Method 2

ACRE-FEET

RESERVOIR	*ITEM*	*2018 DEC*	*2019 JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUNE*	*JULY*	*AUG*	*SEPT*	*OCT*	*NOV*	*2019 DEC*
ABOVE OTOWI BRIDGE														
EL VADO	TOTAL	32,109	30,200	28,400	28,471	42,881	61,858	57,797	45,291	31,307	30,974	25,859	23,121	20,105
	TRANS-MTN	(31,718)	(25,463)	(19,683)	(13,579)	(6,891)	(1,092)	(3,232)	(1,178)	(17,228)	(27,394)	(22,377)	(19,672)	(16,668)
ABIQUIU	TOTAL	81,921	83,969	86,722	89,866	87,905	90,058	70,492	53,760	51,762	61,864	61,821	63,873	66,435
	TRANS-MTN	(79,453)	(82,043)	(84,978)	(87,822)	(85,917)	(88,060)	(68,475)	(51,591)	(49,603)	(59,557)	(59,545)	(61,672)	(64,341)
	ACC. SED	(1,985)	(1,985)	(1,986)	(1,986)	(1,990)	(2,006)	(2,024)	(2,038)	(2,063)	(2,086)	(2,086)	(2,086)	(2,087)
SUBTOTAL RIO GRANDE		874	4,678	8,475	14,950	35,988	60,758	54,558	44,244	14,175	3,801	3,672	3,564	3,444
OTOWI BRIDGE TO SAN MARCIAL														
McCLURE	TOTAL	833	855	868	1,251	1,785	2,564	2,276	1,810	1,349	951	800	734	713
	PRE-COMP	(46)	(68)	(82)	(464)	(273)	(77)	0	0	0	0	0	0	0
	TRANS-MTN	0	0	0	0	0	0	0	0	0	0	0	0	0
NICHOLS	TOTAL	339	309	372	527	466	487	496	497	498	504	501	419	346
	PRE-COMP	(261)	(231)	(294)	(449)	(273)	(77)	0	0	0	0	0	0	0
	TRANS-MTN	(78)	(78)	(78)	(78)	(78)	(78)	0	0	0	0	0	0	0
COCHITI	TOTAL	47,383	43,062	46,044	45,143	45,864	44,613	44,045	43,691	43,482	43,152	43,129	43,413	42,381
	TRANS-MTN	(44,067)	(44,860)	(45,515)	(45,506)	(45,134)	(44,582)	(44,085)	(43,568)	(43,084)	(42,751)	(42,416)	(42,240)	(42,158)
	ACC. SED	(3,448)	(6)	(12)	(21)	(29)	(44)	(52)	(75)	(94)	(108)	(109)	(112)	(116)
GALISTEO	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
JEMEZ	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
	TRANS-MTN	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACC.SED.[1]	0	0	0	0	0	0	0	0	0	0	0	0	0
ACOMITA	TOTAL[2]													
SEAMA	TOTAL[3]													
SUBTOTAL RIO GRANDE		655	(1,017)	1,303	403	2,328	2,806	2,680	2,355	2,151	1,748	1,905	2,214	1,166
NEW MEXICO														
TOTAL RIO GRANDE		1,529	3,661	9,778	15,353	38,316	63,564	57,238	46,599	16,326	5,549	5,577	5,778	4,610

[1] accumulated sediment (312 acre-feet) omitted from the accounting while Jemez Reservoir is dry by decision of the Engineer Advisers, March 4, 2005

[2] storage omitted from accounting by action of the Commission on March 23, 2000

[3] no data available.

Method 2: Reduce Credit Water for Evaporation at the End of the 2020 Calendar Year - Developed by Colorado and New Mexico

RIO GRANDE COMPACT - RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 2020 - Method 2

Quantities in thousands of acre feet to nearest hundred

MONTH	Total Project Storage Capacity Available at End of Month[a]	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							
														SPILL FROM STORAGE			USABLE RELEASE	
		Elephant Butte Reservoir	Caballo Reservoir	Total at End of Month		Colorado Credit Water[c]	New Mexico Credit Water[c]	Total at End of Month			Measured Flow at Caballo Gaging Station	Intervening Diversions to Canals	Total Release and Spill	Caballo Flood Water	Credit Water	Usable Water	Net During Month	Accumulated Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	---	---	---	---	---	0.8[b]	0.0[b]	0.8[b]		---	---	---	---	---	---	---	---	---
JAN	2,210.4	576.3	34.3	610.6	1,599.8	0.8	0.0	0.8		611.4	0.0	0.0	0.0				0.0	0.0
FEB	2,210.4	608.4	36.4	644.8	1,565.6	0.8	0.0	0.8		645.6	0.0	0.0	0.0				0.0	0.0
MAR	2,210.4	551.8	78.8	630.6	1,579.8	0.8	0.0	0.8		631.4	42.1	0.2	42.3				42.3	42.3
APR	2,185.4	499.4	73.5	572.9	1,612.5	0.8	0.0	0.8		573.7	66.0	0.1	66.1				66.1	108.4
MAY	2,185.4	401.2	77.4	478.6	1,706.8	0.8	0.0	0.8		479.4	90.7	0.1	90.8				90.8	199.2
JUN	2,185.4	284.9	63.0	347.9	1,837.5	0.8	0.0	0.8		348.7	130.8	0.2	131.0				131.0	330.2
JUL	2,185.4	174.8	59.6	234.4	1,951.0	0.8	0.0	0.8		235.2	125.3	0.2	125.5				125.5	455.7
AUG	2,185.4	107.7	32.8	140.5	2,044.9	0.8	0.0	0.8		141.3	101.0	0.2	101.2				101.2	556.9
SEPT	2,185.4	81.9	27.8	109.7	2,075.7	0.8	0.0	0.8		110.5	37.1	0.1	37.2				37.2	594.1
OCT	2,210.4	86.6	28.4	115.0	2,095.4	0.8	0.0	0.8		115.8	0.1	0.0	0.1				0.1	594.2
NOV	2,210.4	99.3	28.8	128.1	2,082.3	0.8	0.0	0.8		128.9	0.0	0.0	-				0.0	594.2
DEC	2,210.4	126.5	29.4	155.9	2,054.5	0.8	0.0	0.8		156.7	0.0	0.0	-				0.0	594.2
YEAR	---	---	---	---	---	---	---	---	---	---	593.1	1.1	594.2	0.0	0.0	0.0	594.2	---

Remarks: Cols. 2, 6 and 11 reflect implementation of revised area-capacity tables from Elephant Butte (2017 and 2019) and Caballo (2017) Reservoirs, effective for Compact accounting purposes Jan 1, 2020.

[a] Total Project Storage Capacity is 2,185,400 acre-feet (April through September) and 2,210,400 acre-feet (October through March) which accounts for flood control storage reservation at Caballo Reservoir of 100,000 acre-feet and at Elephant Butte Reservoir of 50,000 acre-feet from April through September and 25,000 acre-feet from October through March. Total capacity of Elephant Butte Reservoir for spill purposes is 1,960,900 acre-feet (April through September) and 1,985,900 acre-feet (October through March). See Engineer Advisers' Report for the 2020 calendar year for explanation of corrections to columns 2 and 6.

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

[c] Calculated on a monthly basis.

ACCRUED DEPARTURE FROM NORMAL RELEASE

	ITEM	DEBIT	CREDIT	BALANCE
P1	Accrued Departure at Beginning of Year[d]	---	---	Cr.
P2	Actual Release during Year	594.2	---	Cr.
P3	Normal Release for Year	---	790.0	Cr.
P4	Under Release in Excess of 150.0	45.8	---	Cr.
P5		---		
P6				
P7	Accrued Departure at End of Year	---	---	Cr.

TIME OF HYPOTHETICAL SPILL Not applicable

APPROVED:

Engineer Adviser for Colorado_____ Date: _____ Engineer Adviser for New Mexico _____ Date: _____ Engineer Adviser for Texas _____ Date: _____

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2020 (FY-2020)

Item	Total Cost	Borne by United States	Borne by		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	$80,854		$80,854		
In New Mexico, above Caballo Reservoir	$78,871	$42,383		$36,488	
In New Mexico, Caballo Reservoir and below	$20,548	$4,110			$16,439
Subtotal	$180,273	$46,493	$80,854	$36,488	$16,439
ADMINISTRATION					
U.S.G.S. Technical Services	$20,595	$6,240	$4,785	$4,785	$4,785
Other expenses[1]	$3,000		$1,000	$1,000	$1,000
Subtotal	$23,595	$6,240	$5,785	$5,785	$5,785
GRAND TOTAL	$203,868	$52,733	$86,639	$42,273	$22,224
EQUAL SHARES			$50,379	$50,379	$50,379

[1]Includes estimated cost of court reporter.

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2022 (FY-2022)

Item	Total Cost	Borne by United States	Borne by		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	$91,131		$91,131		
In New Mexico, above Caballo Reservoir	$86,274	$61,040		$25,234	
In New Mexico, Caballo Reservoir and below	$21,870	$4,374			$17,496
Subtotal	$199,275	$65,414	$91,131	$25,234	$17,496
ADMINISTRATION					
U.S.G.S. Technical Services	$21,654	$6,426	$5,076	$5,076	$5,076
Other expenses[1]	$3,000		$1,000	$1,000	$1,000
Subtotal	$24,654	$6,426	$6,076	$6,076	$6,076
GRAND TOTAL	$223,929	$71,840	$97,207	$31,310	$23,572
EQUAL SHARES			$50,696	$50,696	$50,696

[1]Includes estimated cost of court reporter.

Agreement No: 20RGJFA12
Customer No:
6000001029/6000001775/6000000631
Project No: RG00GVC
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, 2020 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, 2020 to June 30, 2021, the following amounts:

(a)	U.S. Geological Survey	$6,426
(b)	State of Colorado	$4,929
(c)	State of New Mexico	$4,929
(d)	State of Texas	$4,929

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, 2021, 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, 2021, 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 2021 and July 2021. 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

Michael S. Johnson 5/21/2020
Acting Director, New Mexico Water Science Center

RIO GRANDE COMPACT COMMISSION

5-28-2020
Commissioner for Colorado Date

6/9/2020
Commissioner for New Mexico Date

7/25/2020
Commissioner for Texas Date

8/11/2020
Federal Commissioner for RGCC Date

Statement of Work
for
20RGJFA12

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.

ACKNOWLEDGMENTS

This report was prepared by the U.S. Geological Survey, technical adviser to the Rio Grande Compact Commission. The water-supply data contained in this report have been 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.
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 Outlet 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 Bureau of Indian Affairs, Albuquerque, N. Mex., provided 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 Rio Grande Compact Commission gratefully acknowledges the cooperation received from the agencies listed above.

ACCURACY OF RECORDS

The Rules and Regulations of the Commission state that the equipment, method, and frequency of measurement 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. Within the physical limitations of stream gaging, the agencies obtaining the records at Compact gaging stations have complied with these regulations.

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

Rio Grande near Del Norte, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 37°41'19.0", long 106°27'35.5", in NW1/4 NW 1/4 sec. 29, T. 40 N., R. 5 E., on right bank, 40 ft downstream from county highway bridge, 6.0 mi west of Del Norte, and 5.0 mi upstream from Pinos Creek. Datum of gage is 7,980.25 ft above National Geodetic Vertical Datum of 1929. Prior to May 16, 1908, nonrecording gage at site 4 mi downstream at different datum. Records are equivalent.

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

Average discharge. -- 131 years (1890-2020), 884 ft^3/s (640,500 acre-ft per year).

Extremes. -- 1889-2020: 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, 74 ft^3/s Nov. 16, 1956.

Remarks. -- Records good except for estimated for estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, transmountain diversions from Colorado River Basin, diversions for irrigation and municipal use, groundwater withdrawals, return flows from irrigated areas, and flows from sewage-treatment plants. Flow regulated by four reservoirs, total capacity 126,100 acre-ft, and by several smaller ones.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	4,965	240	130	160	9,848
February	5,240	245	145	181	10,394
March	8,119	460	180	262	16,104
April	17,737	1,740	248	591	35,181
May	73,290	3,010	1,720	2,364	145,371
June	38,899	3,040	489	1,297	77,156
July	11,781	528	285	380	23,368
August	6,770	292	173	218	13,428
September	6,668	317	172	222	13,226
October	5,923	229	166	191	11,748
November	6,068	285	140	202	12,036
December	4,695	165	135	151	9,313
Calendar year 2020	190,155	3,040	130	519	377,172

Conejos River below Platoro Reservoir, Colo.

Location. -- Water-stage recorder with satellite telemetry and concrete control, lat 37°21'17.65", long 106°32'39", in SW 1/4 NW 1/4 sec. 22, T. 36 N., R. 4 E., on left bank 1,100 ft downstream from valvehouse for Platoro Reservoir, and 0.7 mi northwest of Platoro. Datum of gage is 9,866.60 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

Drainage area. -- 40 sq mi, approximately.

Average discharge. -- 68 years (1952-2020), 91 ft^3/s (65,780 acre-ft per year).

Extremes. -- 1952-2020: 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 fair except for the periods Nov. 19 to Apr. 15, and estimated daily discharges, which are poor. Flow completely regulated by Platoro Reservoir (0.2 mi upstream) since Nov. 7, 1951.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	335	11	10	11	664
February	306	11	7	11	607
March	218	7	7	7	432
April	1,466	240	9	49	2,908
May	11,051	554	237	356	21,920
June	5,335	524	102	178	10,582
July	2,686	150	28	87	5,328
August	1,038	57	18	33	2,059
September	552	37	7	18	1,095
October	441	23	6	14	875
November	298	19	8	10	592
December	282	10	9	9	560
Calendar year 2020	24,009	554	6	66	47,621

Conejos River near Mogote, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 37°03'14", long 106°11'13", in SE 1/4SE 1/4 sec. 34, T. 33 N., R. 7 E., on left bank 75 ft downstream from bridge on State Highway 174, 0.4 mi downstream from Fox Creek, and 5.3 mi west of Mogote, and 10 mi west of Antonito. Datum of gage is 8,269.39 ft above National Geodetic Vertical Datum of 1929.

Drainage area. -- 282 sq mi.

Average discharge. -- 110 years (1904, 1912-2020), 316 ft^3/s (229,000 acre-ft per year).

Extremes. -- 1903-1905, 1911-2020: Maximum discharge, 9,000 ft^3/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, also occurred Aug. 19, 2002.

Remarks. -- Records good except for estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation and return flows from irrigated areas. Some regulation by Platoro Reservoir (about 59 mi upstream) since Nov. 7, 1951.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,717	64	46	55	3,406
February	1,355	52	41	47	2,688
March	2,049	84	50	66	4,064
April	5,318	566	64	177	10,548
May	28,725	1,380	643	927	56,976
June	12,227	1,100	166	408	24,252
July	5,496	428	95	177	10,901
August	2,977	182	58	96	5,905
September	2,973	182	42	99	5,897
October	1,953	87	50	63	3,874
November	2,472	143	49	82	4,903
December	1,730	68	41	56	3,431
Calendar year 2020	68,992	1,380	41	188	136,846

San Antonio River at Ortiz, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 36°59'35", long 106°02'17", in New Mexico in NE 1/4 SE 1/4, 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 above National Geodetic Vertical Datum of 1929.

Drainage area. -- 110 sq mi, approximately.

Average discharge. -- 80 years (1941-2020), 24 ft^3/s (17,130 acre-ft per year).

Extremes. -- 1920, 1925-2020: 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 fair except for flows below 1 ft^3/s, and estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation and return flows 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	146	5	4	5	290
February	127	5	4	4	252
March	220	14	5	7	436
April	719	70	6	24	1,426
May	502	67	2	16	996
June	18	2	0	1	35
July	0	0	0	0	0
August	0	0	0	0	1
September	14	2	0	0	28
October	50	5	0	2	99
November	98	5	2	3	194
December	78	3	2	3	154
Calendar year 2020	1,972	70	0	5	3,911

Los Pinos River near Ortiz, Colo

Location. -- Water-stage recorder with satellite telemetry, 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 above National Geodetic Vertical Datum of 1929.

Drainage area. -- 167 sq mi.

Average discharge. -- 102 years (1915-1920, 1925-2020), 115 ft^3/s (83,260 acre-ft per year).

Extremes. -- 1915-1920, 1925-2020: 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, 1.7 ft^3/s Aug. 27, 2002.

Remarks. -- Records good except for those below 10 ft^3/s, which are fair, and estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation and return flows 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	410	14	13	13	813
February	416	16	13	14	825
March	588	23	16	19	1,166
April	3,759	454	19	125	7,456
May	9,013	539	110	291	17,877
June	1,277	130	14	43	2,533
July	501	53	8	16	993
August	355	20	7	11	703
September	608	42	6	20	1,205
October	428	22	10	14	848
November	708	41	13	24	1,404
December	454	18	11	15	901
Calendar year 2020	18,516	539	6	51	36,726

Conejos River near Lasauses, Colo

Location. -- Two water-stage recorders with satellite telemetry, lat 37°18'01", long 105°44'47", in SW 1/4 SW 1/4 sec. 2, T. 35 N., R. 11 E., on left bank of main channel 125 ft downstream from bridge on State Highway 158, 2.1 mi north of Lasauses, and on left bank of secondary channel 1,550 ft upstream from bridge, 1.0 mi upstream from mouth, and 1.5 mi north of Lasauses. Datum of gage on main (north) channel is 7,495.02 ft above National Geodetic Vertical Datum of 1929, and on secondary (south) channel is 7,499.86 ft above National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation).

Drainage area. -- 887 sq mi.

Average discharge. -- 99 years (1922-2020), 168 ft^3/s (122,000 acre-ft per year).

Extremes. -- 1921-2020: Maximum discharge, 3,890 ft^3/s May 15, 1941; no flow at times in some years.

Remarks. -- Records good except for flows below 1.0 ft^3/s, and estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation, groundwater withdrawals, and return flows from irrigated areas. Flow regulated to some extent by Platoro Reservoir (about 83 mi upstream) since Nov. 7, 1951.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	1,829	70	41	59	3,628
February	1,995	80	62	69	3,957
March	2,725	108	74	88	5,405
April	1,409	106	18	47	2,795
May	1,336	210	3	43	2,649
June	165	39	0	6	328
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0
November	1,578	102	0	53	3,131
December	1,448	56	37	47	2,872
Calendar year 2020	12,485	210	0	34	24,764

Rio Grande near Lobatos, Colo

Location. -- Water-stage recorder with satellite telemetry, lat 37°04'43", long 105°45'25", in NE 1/4 NW 1/4 sec. 27, T. 33 N., R. 11 E., on right bank at highway bridge, 5.7 mi north of Colorado-New Mexico State line, 11 mi east of Lobatos, and 14 mi east of Antonito. Datum of gage is 7,427.63 ft above National Geodetic Vertical 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 (1900-1930), 846 ft^3/s (612,900 acre-ft per year); 90 years (1931-2020) 425 ft^3/s (307,700) acre-ft per year).

Extremes. -- 1899-2020: 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, 1956.

Remarks. -- Records good except for flows below 20 ft^3/s, which are fair, and estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, transmountain diversions, diversions for irrigation and municipal use, groundwater withdrawals, return flows from irrigated areas, and flows from sewage-treatment plants.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	7,460	265	215	241	14,797
February	9,110	385	240	314	18,070
March	12,166	563	326	392	24,131
April	4,180	324	79	139	8,291
May	6,334	361	119	204	12,563
June	3,875	318	57	129	7,686
July	1,093	60	19	35	2,168
August	491	38	7	16	973
September	275	16	4	9	546
October	512	50	7	17	1,016
November	4,447	345	35	148	8,821
December	6,350	250	170	205	12,595
Calendar year 2020	56,293	563	4	154	111,657

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 (1963-1969), 11.5 ft^3/s (8,330 acre-ft per year) prior to completion of Azotea tunnel; 51 years (1970-2020) 133 ft^3/s (96,190 acre-ft per year) subsequent to completion of Azotea tunnel.

Extremes. -- 1963-2003: Maximum discharge, 1,610 ft^3/s Mar. 12, 1985 (gage height, 6.65 ft); 2003-2020: Maximum daily discharge, 1,030 ft^3/s Apr. 4, 2005; no flow at times.

Remarks. -- 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
February	0	0	0	0	0
March	1,346	94	0	43	2,670
April	5,825	579	20	194	11,553
May	13,779	627	248	444	27,330
June	4,577	465	0	153	9,079
July	514	144	0	17	1,019
August	104	43	0	3	207
September	40	13	0	1	80
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year 2020	26,185	627	0	71	51,938

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 (1963-1973,1986), 1.17 ft^3/s (848 acre-ft per year).
Extremes. -- 1963-2011: Maximum discharge, 3,960 ft^3/s July 30, 1968 (gage height, 4.9 ft); no flow most of time.
Remarks. -- Records good for period of record. Diversions above station for irrigation of meadows and for off-channel stock tanks. Seasonal gage discontinued in 2011.

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	---	---	---	---	---
June	---	---	---	---	---
July	---	---	---	---	---
August	---	---	---	---	---
September	---	---	---	---	---
October	---	---	---	---	---
November	---	---	---	---	---
December	---	---	---	---	---
Calendar year 2018	---	---	---	---	---

Willow Creek below Heron Dam, N. Mex.

Location. -- Totalizing flowmeters, lat 36°39'46", long 106°42'20", 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. -- 50 years (1971-2020), 131 ft^3/s (94,620 acre-ft per year).
Extremes. -- 1971-2020: Maximum daily discharge, 2,780 ft^3/s Dec. 18, 19, 1982; no flow at times each year.
Remarks. -- 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	326	44	0	11	647
February	0	0	0	0	0
March	0	0	0	0	0
April	1,820	203	0	61	3,610
May	3,378	205	45	109	6,700
June	10,236	502	45	341	20,303
July	4,844	499	0	156	9,608
August	10,947	599	39	353	21,713
September	16,426	591	0	548	32,580
October	0	0	0	0	0
November	0	0	0	0	0
December	282	20	0	9	559
Calendar year 2020	48,259	599	0	132	95,720

Rio Chama below El Vado Dam, N. Mex

Location. -- Water-stage recorder with satellite telemetry, lat 36°34'49.38", long 106°43'29.16", 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 at different datum. October 1935 to September 1938, at site 1.1 mi upstream at datum 30.34 ft higher.

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

Average discharge. -- 4 years (1914, 1921-1923), 448 ft^3/s (324,600 acre-ft per year), prior to completion of El Vado Dam; 35 years (1936-1970), 373 ft^3/s (270,200 acre-feet per year), prior to release of transmountain water; 46 years (1971-2020) 453 ft^3/s (328,600 acre-feet per year).

Extremes. -- 1914-1916, 1920-1924, 1936-2020; Maximum discharge observed, 9,000 ft^3/s May 22, 1920 (gage height, 12 ft); no flow Mar. 25, 26, 31, 1955.

Remarks. -- Records good except for estimated discharges, which are fair. Flow regulated by El Vado Reservoir since 1935. Flow affected by release of transmountain water from Heron Reservoir since May 1971. Diversions for irrigation of about 10,600 acres upstream from station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	3,185	108	99	103	6,317
February	2,793	100	93	96	5,541
March	3,037	170	93	98	6,023
April	7,942	428	207	265	15,753
May	14,666	701	294	473	29,090
June	14,861	790	108	495	29,477
July	12,749	815	101	411	25,288
August	19,653	803	345	634	38,982
September	18,706	793	192	624	37,103
October	3,233	191	85	104	6,412
November	3,216	111	102	107	6,379
December	3,222	105	103	104	6,391
Calendar year 2020	107,263	815	85	293	212,755

Rio Chama below Abiquiu Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 36°14'14", long 106°25'02.7", 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 (1962-1970), 384 ft^3/s (278,200 acre-ft per year), prior to release of transmountain water; 50 years (1971-2020), 500 ft^3/s (362,200 acre-feet per year).

Extremes. -- 1961-2020; Maximum discharge, 2,990 ft^3/s July 1, 1965 (gage height, 6.69 ft); minimum, about 0.5 ft^3/s Mar. 17, 1966, Jan. 28, 1972.

Remarks. -- Records good except for estimated discharges, which are poor. Flow regulated by El Vado and Abiquiu reservoirs since Feb. 1963. Since May 1971, flow affected by release of transmountain water from Heron Reservoir. Diversions for irrigation of about 17,600 acres upstream from station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	2,353	77	75	76	4,666
February	2,072	84	50	71	4,109
March	1,777	81	50	57	3,525
April	9,171	392	125	306	18,191
May	13,634	730	153	440	27,043
June	24,489	1,030	628	816	48,574
July	21,868	1,040	250	705	43,375
August	20,049	766	452	647	39,767
September	13,053	595	319	435	25,891
October	3,462	302	69	112	6,867
November	2,242	102	48	75	4,448
December	1,749	76	48	56	3,468
Calendar year 2020	115,919	1,040	48	317	229,924

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

Location. -- Water-stage recorder with satellite telemetry, lat 35°50'46", long 105°54'35", on 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. -- -- 42 years (1979-2020), 12.5 ft^3/s (9,050 acre-feet per year).

Extremes. -- 1979-2020; Maximum discharge, 312 ft^3/s June 9, 1979 at site 1,100 ft downstream; no flow December 31, 1993.

Remarks. -- Records fair except for estimated discharges, which are poor. 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	29	1	1	1	57
February	70	4	1	2	139
March	249	12	4	8	494
April	343	24	8	11	680
May	700	26	17	23	1,388
June	567	29	6	19	1,125
July	511	37	1	16	1,014
August	127	6	1	4	252
September	43	5	1	1	85
October	29	1	1	1	58
November	28	1	1	1	56
December	30	1	1	1	60
Calendar year 2020	2,727	37	1	7	5,409

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

Location. -- Water-stage recorder with satellite telemetry, lat 35°52'28.2", long 106°08'32.8", in San Ildefonso Pueblo Grant, 400 ft 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 5,491.66 ft above North American Vertical Datum of 1988, from global navigation satellite system survey. 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. -- 121 years (1896-1905, 1910-2020), 1,471 ft^3/s (1,065,000 acre-feet per year).

Extremes. -- 1895-1905, 1910-2020; Maximum discharge, 24,400 ft^3/s May 23, 1920 (gage height, 14.1 ft); minimum daily, 195 ft^3/s Aug. 4, 1977.

Remarks. -- Records good except for estimated discharges, which are poor. Considerable regulation by Heron, El Vado, and Abiquiu reservoirs on Rio Chama. Flow affected by release of transmountain water from Heron Reservoir since May 1971. Diversions upstream from station for irrigation of about 620,000 acres in Colorado and 75,000 acres in New Mexico.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	20,727	689	637	669	41,112
February	21,891	874	639	755	43,421
March	26,823	1,030	771	865	53,203
April	25,109	1,060	660	837	49,804
May	31,832	1,230	874	1,027	63,139
June	32,346	1,210	957	1,078	64,158
July	25,781	1,070	441	832	51,137
August	23,924	880	642	772	47,453
September	17,626	704	498	588	34,961
October	9,668	476	242	312	19,176
November	14,055	703	333	469	27,878
December	15,920	580	460	514	31,577
Calendar year 2020	265,702	1,230	242	726	527,020

Santa Fe River near Santa Fe, N. Mex.

Location. -- Water-stage recorder with satellite telemetry and concrete control, lat 35°41'11.2", long 105°50'37", in Santa Fe National Forest, on left bank 0.4 mi downstream from McClure Dam, and 5.3 mi east of Santa Fe at mile 36.6. 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. -- 108 years (1913-2020), 7.8 ft^3/s (5,600 acre-feet per year).

Extremes. -- 1913-2020; Maximum discharge, 1,500 ft^3/s Aug. 14, 1921 (gage height, 5.17 ft); from rating curve extended above 150 ft^3/s; no flow at times.

Remarks. -- Records good. Flow regulated by McClure Reservoir, completed in 1926, raised in 1935, 1947 and again in 1989.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	34	2	1	1	67
February	69	9	1	2	138
March	116	6	1	4	230
April	158	11	4	5	314
May	261	10	7	8	517
June	211	10	6	7	418
July	228	8	6	7	452
August	230	8	7	7	456
September	203	8	4	7	403
October	97	7	0	3	193
November	62	4	1	2	123
December	38	1	1	1	76
Calendar year 2020	1,707	10	0	5	3,387

Rio Grande below Cochiti Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°37'04.8", long 106°19'26.2", 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, and at mile 1,587.6. Datum of gage is 5,229.01 ft above North American Vertical Datum of 1988. 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. -- 50 years (1971-2020), 1,259 ft^3/s (912,000 acre-feet per year).

Extremes. -- 1971-2020; 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 except for estimated discharges, which are poor. Discharges include flow of Santa Fe River, which is intercepted by Cochiti Dam and released through the combined outlet works. Flow regulated by Cochiti Dam since Nov. 12, 1973. Diversions upstream from station for irrigation of about 620,000 acres in Colorado and about 81,000 acres in New Mexico. Cochiti Eastside Main canal, on left bank, and Sili Main canal, on right bank, head at Cochiti Dam and bypass gage for irrigation of about 6,000 acres downstream from station.

Monthly and yearly discharge, in cubic feet per second

Month	Second-foot-days	Maximum daily	Minimum daily	Mean	Runoff in acre-feet
January	17,833	704	437	575	35,372
February	17,402	684	576	600	34,517
March	23,755	914	644	766	47,118
April	18,980	743	608	633	37,647
May	26,297	993	778	848	52,160
June	26,526	892	837	884	52,614
July	19,934	805	304	643	39,539
August	16,622	645	411	536	32,970
September	11,931	590	289	398	23,665
October	4,876	277	113	157	9,672
November	11,655	632	236	389	23,118
December	14,820	647	408	478	29,395
Calendar year 2020	210,631	993	113	575	417,787

Galisteo Creek below Galisteo Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 35°27'52.75", long 106°12'48.2", 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. -- 596 sq mi.

Average discharge. -- 50 years (1971-2020), 5.0 ft^3/s (3,542 acre-feet per year).

Extremes. -- 1970-2020; Maximum discharge, 3,460 ft^3/s Aug. 24, 1997 (gage height, 5.57 ft); no flow many days each year.

Remarks. -- Records fair. Flow regulated by Galisteo Reservoir 0.4 mi upstream. 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
February	0	0	0	0	1
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	123	83	0	4	243
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year 2020	123	83	0	0	244

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

Location. -- Water-stage recorder with satellite telemetry, lat 35°23'41", long 106°32'41", in NE1/4 SW1/4 SW1/4 sec. 32, T. 14 N., R. 4 E., gage located at outlet pipe for Jemez Canyon Dam, 0.7 mi upstream from prior gage location. Elevation of gage is 5,162 ft above National Geodetic Vertical Datum of 1929, from topographic map. Gage replaces Jemez River below Jemez Canyon Dam. Discharge records for two gages are comparable except the period 2002-2009, when original gage was affected by siltation.

Drainage area. -- 1,034 sq mi.

Average discharge. -- 11 years (2010-2020), 34.9 ft^3/s (25,280 acre-feet per year).

Extremes. -- 2010-2020; Maximum discharge, 1,420 cfs Jul. 27, 2013 (gage height, 4.82); no flow many days each year.

Remarks. -- Records fair except for estimated discharges, which are poor. 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	399	24	6	13	791
February	508	30	5	18	1,007
March	1,918	164	19	62	3,804
April	2,178	144	44	73	4,321
May	916	132	0	30	1,816
June	2	1	0	0	4
July	40	33	0	1	79
August	4	2	0	0	7
September	0	0	0	0	0
October	0	0	0	0	0
November	24	9	0	1	48
December	6	3	0	0	11
Calendar year 2020	5,993	164	0	16	11,888

Rio Grande below Elephant Butte Dam, N. Mex.

Location. -- Water-stage recorder with satellite telemetry, lat 33°08'54.64", long 107°12'24.42", in Pedro Armendariz Grant, on left bank 1.0 mi downstream from dam, 1.5 mi upstream from Cuchillo Negro River. Datum of gage is 4,243.22 ft above North American Vertical Datum of 1988. Prior to Mar. 24, 1980, at datum 1.0 ft higher. Prior to April 24, 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. -- 106 years (1915-2020), 961 ft^3/s (696,000 acre-feet per year).

Extremes. -- 1915-2020; Maximum daily discharge, 8,220 ft^3/s May 22, 1942; no flow at times.

Remarks. -- Records good except for estimated discharges, which are poor. 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	19	1	0	1	38
February	525	148	0	18	1,041
March	47,770	2,320	94	1,541	94,751
April	33,180	1,280	1,060	1,106	65,813
May	51,760	2,050	1,260	1,670	102,666
June	59,740	2,220	1,750	1,991	118,494
July	62,100	2,280	1,540	2,003	123,175
August	37,891	1,530	867	1,222	75,157
September	15,956	993	16	532	31,648
October	35	15	0	1	69
November	24	1	0	1	48
December	23	1	0	1	45
Calendar year 2020	309,022	2,320	0	844	612,946

Rio Grande below Caballo Dam, N. Mex.

Location. -- Water-stage recorder, lat 32°53'05.68", long 107°17'33.71", on left bank 2,000 ft upstream from Interstate Highway 25, 4,200 ft downstream from Caballo Dam, 1.2 mi downstream from Apache Canyon 1.3 mi upstream from Percha diversion dam, and 3 mi northeast of Arrey. Datum of gage is 4,133.19 ft above North American Vertical Datum of 1988. 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. -- 83 years (1938-2020), 887 ft^3/s (642,700 acre-feet per year).

Extremes. -- 1938-2020; Maximum daily discharge, 7,650 ft^3/s May 20, 1942; minimum daily, 0.0 ft^3/s May 9-15, 2012 and Oct 3, 2012.

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	19	1	1	1	37
February	16	1	1	1	31
March	21,228	1,677	1	685	42,105
April	33,262	1,272	1	1,109	65,975
May	45,705	2,010	1	1,474	90,656
June	65,957	2,420	1,755	2,199	130,826
July	63,154	2,505	1,882	2,037	125,266
August	50,921	1,843	787	1,643	101,002
September	18,687	1,024	595	623	37,065
October	26	1	1	1	52
November	25	1	1	1	50
December	25	1	1	1	51
Calendar year 2020	299,024	2,505	1	1	593,115

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 USGS Water-Supply Papers and Water-Data Reports from October 1947 until September, 2005.

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	0.0
March	221.0
April	85.0
May	61.0
June	183.0
July	202.0
August	220.0
September	125.0
October	37.0
November	1.9
December	1.9
Calendar year 2020	1,137.8

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 2020

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 2020

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	22.3	26.8	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Contents	297	440	561	561	561	561	0	0	0	0	0	0	-
Change	+155	+143	+121	0	0	0	-561	0	0	0	0	0	-142

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 2020

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 2020

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 2020

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 2020

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	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	2,437	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 2020

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	27.0	27.0	27.0	27.0	27.0	-
Contents	598	598	598	598	598	598	598	598	598	598	598	598	-
Change	0	0	0	0	0	0	0	0	0	0	0	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 2020

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 2020

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 2020

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	13.9	15.5	17.2	17.2	13.6	11.5	7.3	7.3	7.3	7.3	7.3	7.3	-
Contents	165	200	237	237	159	119	55	55	55	55	55	55	-
Change	+37	+35	+37	0	-78	-40	-64	0	0	0	0	0	-73

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, 2019	9,980.46	18,599	-
January 31, 2020	9,980.10	18,399	-200
February 29	9,979.74	18,204	-195
March 31	9,980.18	18,438	+234
April 30	9,980.39	18,561	+123
May 31	9,982.25	19,606	+1045
June 30	9,981.38	19,113	-493
July 31	9,975.43	15,916	-3,197
August 31	9,972.75	14,564	-1,352
September 30	9,972.35	14,366	-198
October 31	9,971.13	13,772	-594
November 30	9,971.81	14,104	+332
December 31, 2020	9,972.07	14,231	+127
Calendar year 2020	-	-	-4368

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 2020

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cal. Yr.
Gage height	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	-
Contents	869	869	869	869	869	869	869	869	869	869	869	869	-
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)

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, 2019	7,116.69	106,197	-
January 31, 2020	7,116.51	105,745	-452
February 29	7,116.65	106,096	+351
March 31	7,117.56	108,406	+2,310
April 30	7,119.78	114,225	+5,819
May 31	7,126.38	133,018	+18,793
June 30	7,121.62	119,243	-13,775
July 31	7,118.13	109,876	-9,367
August 31	7,108.45	87,178	-22,698
September 30	7,089.11	54,213	-32,965
October 31	7,088.92	53,953	-260
November 30	7,088.87	53,884	-69
December 31, 2020	7,088.42	53,271	-613
Calendar year 2020	-	-	+52,926

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, 2019	6,825.47	32,109	-	31,718
January 31, 2020	6,823.69	30,200	-1,909	25,463
February 29	6,821.95	28,400	-1,800	19,863
March 31	6,822.02	28,471	+71	13,579
April 30	6,834.48	42,881	+14,410	6,891
May 31	6,847.77	61,858	+18,977	1,092
June 30	6,845.15	57,797	-4,061	3,232
July 31	6,836.33	45,291	-12,506	1,178
August 31	6,824.73	31,307	-13,984	17,228
September 30	6,824.42	30,974	-333	27,394
October 31	6,819.40	25,859	-5,115	22,377
November 30	6,816.53	23,121	-2,738	19,672
December 31, 2020	6,813.18	20,105	+3,016	16,668
Calendar year 2020	-	-	+12,004	-

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, 2019	6,188.65	81,921	-	79,453
January 31, 2020	6,189.44	83,969	+2,048	82,043
February 29	6,190.48	86,722	+2,753	84,978
March 31	6,191.64	89,866	+3,144	87,822
April 30	6,190.92	87,905	-1,961	85,917
May 31	6,191.71	90,058	+2,153	88,060
June 30	6,183.97	70,492	-19,566	68,475
July 31	6,176.15	53,760	-16,732	51,687
August 31	6,175.12	51,762	-1,998	49,697
September 30	6,180.10	61,864	+10,102	59,650
October 31	6,180.08	61,821	-43	59,636
November 30	6,181.03	63,873	+2,052	61,763
December 31, 2020	6,182.19	66,435	+2,562	64,341
Calendar year 2020	-	-	-15,486	-

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, 2019	6,820.91	1,430	-
January 31, 2020	6,824.71	1,626	+196
February 29	6,826.59	1,728	+102
March 31	6,826.66	1,732	+4
April 30	6,826.47	1,721	-11
May 31	6,826.80	1,740	+19
June 30	6,817.43	1,263	-477
July 31	6,800.70	639	-624
August 31	6,798.88	588	-51
September 30	6,802.38	690	+102
October 31	6,806.43	819	+129
November 30	6,810.27	958	+139
December 31, 2020	6,813.56	1,091	+133
Calendar year 2020	-	-	-339

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 7,800 ft above North American Vertical Datum of 1988 (levels by City of Santa Fe). 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, 2019	7,848.79	833	-	46	0
January 31, 2020	7,849.35	855	+22	68	0
February 29	7,849.71	868	+13	82	0
March 31	7,858.46	1,251	+383	464	0
April 30	7,868.13	1,785	+534	273	0
May 31	7,880.03	2,564	+779	77	0
June 30	7,868.62	2,276	-288	0	0
July 31	7,860.43	1,810	-466	0	0
August 31	7,860.43	1,349	-461	0	0
September 30	7,851.82	951	-398	0	0
October 31	7,847.89	800	-151	0	0
November 30	7,846.01	734	-66	0	0
December 31, 2020	7,845.39	713	-21	0	0
Calendar year 2020	-		-120		

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 7,400 ft above North American Vertical Datum of 1988 (levels by City of Santa Fe). 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, 2019	7,473.63	339	-	261	78
January 31, 2020	7,472.03	309	-30	231	78
February 29	7,475.28	372	+63	294	78
March 31	7,481.77	527	+155	449	78
April 30	7,479.42	466	-61	273	78
May 31	7,480.30	487	+21	77	78
June 30	7,480.62	496	+9	0	0
July 31	7,480.65	497	+1	0	0
August 31	7,480.71	498	+1	0	0
September 30	7,480.94	504	+6	0	0
October 31	7,480.83	501	-3	0	0
November 30	7,477.37	419	-82	0	0
December 31, 2020	7,474.00	346	-73	0	0
Calendar year 2020	-		+7		

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, 2019	5,344.02	47,383	-	44,067
January 31, 2020	5,344.55	43,062	-4,321	44,860
February 29	5,347.01	46,044	+2,982	45,515
March 31	5,346.30	45,143	-901	45,506
April 30	5,346.87	45,864	721	45,134
May 31	5,345.87	44,613	-1,251	44,582
June 30	5,345.40	44,045	-568	44,085
July 31	5,345.10	43,691	-354	43,568
August 31	5,344.92	43,482	-209	43,084
September 30	5,344.63	43,152	-330	42,751
October 31	5,344.61	43,129	-23	42,416
November 30	5,344.86	43,413	+284	42,240
December 31, 2020	5,343.93	42,381	-1032	42,158
Calendar year 2020	-	-	+5,002	-

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 2020

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	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, 2019	5,133.00	0	-	0
January 31, 2020	5,133.00	0	0	0
February 29	5,133.00	0	0	0
March 31	5,133.00	0	0	0
April 30	5,133.00	0	0	0
May 31	5,133.00	0	0	0
June 30	5,133.00	0	0	0
July 31	5,133.00	0	0	0
August 31	5,133.00	0	0	0
September 30	5,133.00	0	0	0
October 31	5,133.00	0	0	0
November 30	5,133.00	0	0	0
December 31, 2020	5,133.00	0	0	0
Calendar year 2020	-	-	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 2020

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 2020.

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, 2019	4,344.90	557,291	-	194
January 31, 2020	4,347.13	577,364	+20,073	193
February 29	4,349.31	609,484	+32,120	193
March 31	4,345.43	552,864	-56,620	192
April 30	4,341.67	500,522	-52,342	190
May 31	4,333.91	402,203	-98,319	186
June 30	4,322.97	285,834	-116,369	182
July 31	4,309.69	175,732	-110,102	178
August 31	4,298.76	108,559	-67,173	174
September 30	4,293.33	82,762	-25,797	170
October 31	4,294.40	87,491	+4,729	166
November 30	4,297.10	100,201	+12,710	163
December 31, 2020	4,302.18	127,253	+27,052	162
Calendar year 2020	-	-	+430,038	-

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, 2019	4,141.77	33,872	-
January 31, 2020	4,142.06	34,327	+455
February 29	4,142.73	36,416	+2,089
March 31	4,152.68	78,809	+42,393
April 30	4,151.67	73,476	-5,333
May 31	4,152.41	77,361	+3,885
June 30	4,149.54	62,978	-14,383
July 31	4,148.80	59,575	-3,403
August 31	4,141.54	32,766	-26,809
September 30	4,139.77	27,762	-5,004
October 31	4,139.99	28,364	+602
November 30	4,140.13	28,752	+388
December 31, 2020	4,140.38	29,449	+697
Calendar year 2020	-	-	-4,423

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, 2019	591,163	-
January 31, 2020	611,691	+20,528
February 29	645,900	+34,209
March 31	631,673	-14,227
April 30	573,998	-57,675
May 31	479,564	-94,434
June 30	348,812	-130,752
July 31	235,307	-113,505
August 31	141,325	-98,982
September 30	110,524	-30,801
October 31	115,855	+5,331
November 30	128,953	+13,098
December 31, 2020	156,702	+27,749
Calendar year 2020	-	-434,461

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

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, 2020

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	9
March	0	0	0	0	0	0	1,644
April	0	0	0	0	0	0	10,605
May	184	313	95	172	0	155	26,972
June	294	564	164	221	87	57	7,866
July	0	0	16	81	0	0	876
August	0	0	0	47	0	0	159
September	0	0	6	42	3	0	83
October	0	0	0	32	0	0	0
November	0	0	0	4	0	0	0
December	0	0	0	0	0	0	0
Calendar year	478	877	281	599	90	212	48,214

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
2020

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Annual
Alamosa	Evap.	-	-	-	-	-	-	-	-	-	-	-	-	-
Airport	Precip.	0.14	0.12	0.22	0.09	0.23	0.17	1.58	0.33	1.53	1.03	0.33	0.36	6.13
Platoro	Evap.	-	-	-	-	3.76	8.72	8.58	6.86	5.32	5.89	-	-	-
Dam	Precip.	-	-	-	-	0.20	1.1	4.62	1.60	2.56	0.00	-	-	-
Heron	Evap.	-	-	-	5.84	9.33	10.25	9.45	9.46	7.35	6.66	-	-	-
Dam	Precip.	0.99	0.70	0.97	0.02	0.21	0.51	1.71	1.64	3.00	1.16	1.01	1.42	13.34
El Vado	Evap.	-	-	-	7.26	9.72	10.52	9.78	9.19	6.13	5.32	-	-	-
Dam	Precip.	0.53	0.76	0.78	0.00	0.15	0.44	2.46	0.52	2.26	1.41	0.81	1.05	11.17
Abiquiu	Evap.	2.47	3.77	6.20	7.35	12.40	13.07	10.81	10.72	8.70	7.92	3.72	2.22	89.35
Dam	Precip.	0.04	0.15	0.42	0.01	0.23	0.42	1.60	0.67	1.20	0.42	0.50	0.35	6.01
Nambe	Evap.	-	-	-	7.20	10.93	11.53	8.84	11.13	8.26	5.48	-	-	-
Canyon Dam	Precip.	0.97	0.84	0.00	0.00	0.00	1.77	1.15	0.66	0.50	0.25	0.32	0.50	6.96
Cochiti	Evap.	2.79	4.29	7.05	7.22	9.56	9.98	10.05	9.98	7.01	6.79	3.85	2.83	81.40
Dam	Precip.	0.82	0.83	1.44	0.67	0.15	0.82	0.62	0.86	0.65	0.18	0.28	0.15	7.47
Jemez	Evap.	3.10	4.58	7.66	9.53	12.62	12.30	13.61	11.84	9.66	5.89	4.25	3.14	98.18
Canyon Dam	Precip.	0.44	0.74	0.70	0.14	0.04	0.12	0.71	0.45	0.30	0.23	0.04	0.24	4.15
Elephant	Evap.	4.24	5.36	10.00	14.42	19.13	19.82	18.59	15.96	12.77	11.80	8.23	4.87	145.19
Butte Dam	Precip.	0.08	0.90	0.50	0.00	0.08	0.22	3.51	0.21	1.12	0.16	0.04	0.39	7.21
Caballo	Evap.	3.84	4.36	7.77	12.90	16.06	16.63	16.24	14.44	12.24	9.34	7.48	4.37	125.67
Dam	Precip.	0.08	1.14	0.77	0.00	0.00	0.98	3.05	0.28	1.75	0.16	0.00	0.39	8.60
State	Evap.	3.67	4.43	6.54	10.57	13.47	13.93	12.79	12.20	9.23	8.09	5.67	3.76	104.35
University	Precip.	0.17	0.82	2.46	0.00	0.00	0.26	1.46	0.70	0.43	0.45	0.00	0.25	7.00

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.

(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.

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

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.)

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.

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:

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.

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.

(1) GAGING STATIONS /1, /2

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 station on the Rio Grande below Caballo Reservoir 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 compact stream gaging station shall be sufficient to obtain stream flow records at least equal in accuracy to those classified as “good” by the U.S. Geological Survey. The stream flow records for each compact stream gaging station shall be reviewed annually by the U.S. Geological Survey to ensure accuracy. 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.
/2 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

(2) 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.

(3) ACTUAL SPILL /2, /3, /4, /6

(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., 1,999,600 acre-feet in the months of October through March inclusive, and 1,974,600 acre-feet in the months of April through September, inclusive, as determined from the 2009 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.

(4) 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.
/6 Adopted March 31, 2009; made effective January 1, 2010.

(5) 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.

(6) 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.

(7) 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.

(8) 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.

(9) 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.

(10) SECRETARY /8, /9, /10

The Commission may, on a yearly basis, employ appropriate entities to render such engineering and clerical aid as may reasonably be necessary for administration of the Compact. The entities may be employed to:

(1) Collect and correlate all factual data and other records having a material bearing on the administration of the Compact and keep each Commissioner advised 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 in writing within thirty days after the end of each quarter 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 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.

(11) COSTS /1, /2, /3

At its annual meeting, 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.
/9 Amended March 31, 2009.
/10 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.
/1 Amended at Eleventh Annual Meeting, February 23, 1950.
/2 Amended March 31, 2009.
/3 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

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 that the Commissioner 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 the State represented by the Commissioner an appropriation of sufficient funds with which to meet the obligations of that State, as provided by the Compact.

(12) MEETING OF COMMISSION /1, /10, /11

The Commission shall meet 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. 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.
/11 Amended at Seventy-Seventh Annual Meeting, March 31, 2016.

Errata Sheet for the
2019 Report of the Rio Grande Compact Commission

1. On page 27, substitute the third paragraph under the Budget heading with the following: "The Engineer Advisers found that the proposed budget for the fiscal year ending June 30, 2021, indicates that a total of *$228,229* will be spent for gaging and administration, with a proposed contribution by the United States federal government of *$74,203*.
2. On page 43, make the following changes: Substitute the following table for the Budget for Fiscal Year Ending June 30, 2021 (the numbers in italics are revised):

BUDGET FOR FISCAL YEAR ENDING JUNE 30, 2021

Item	Total Cost	Borne by United States	Borne by		
			Colorado	New Mexico	Texas
GAGING STATIONS					
In Colorado	$84,058		$84,058		
In New Mexico, above Caballo Reservoir	$86,274	$61,040		$25,234	
In New Mexico, Caballo Reservoir and below	$33,684	$6,737			$26,947
Subtotal	$204,016	$67,777	$84,058	$25,234	$26,947
ADMINISTRATION					
U.S.G.S. Technical Services	*$21,213*	*$6,426*	$4,929	$4,929	$4,929
Other expenses[1]	$3,000		$1,000	$1,000	$1,000
Subtotal	*$24,213*	*$6,426*	$5,929	$5,929	$5,929
GRAND TOTAL	*$228,229*	*$74,203*	$89,987	$31,163	$32,876
EQUAL SHARES			$51,342	$51,342	$51,342

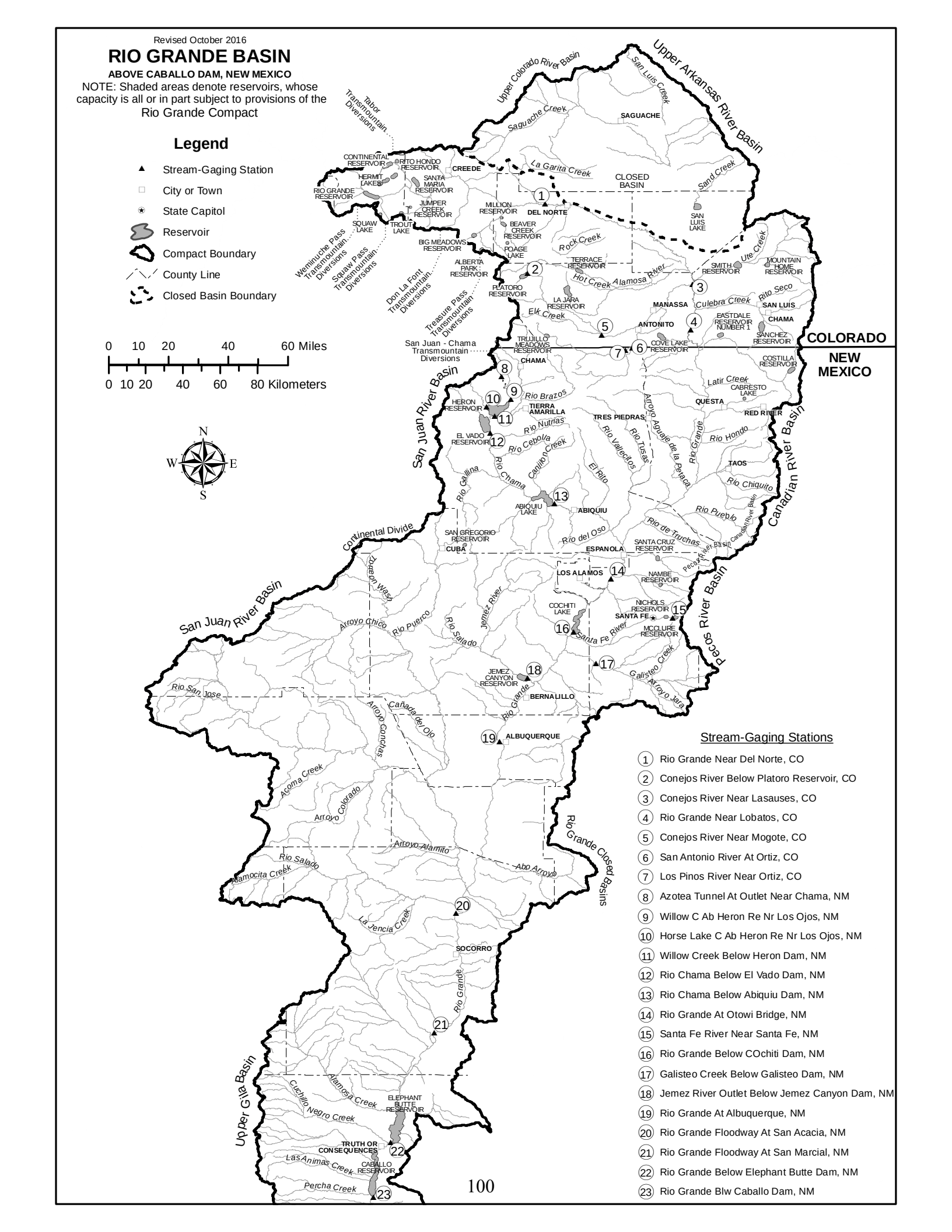
[1]Includes estimated cost of court reporter.

Revised October 2016

RIO GRANDE BASIN

ABOVE CABALLO DAM, NEW MEXICO

NOTE: Shaded areas denote reservoirs, whose capacity is all or in part subject to provisions of the Rio Grande Compact



Stream-Gaging Stations

1. Rio Grande Near Del Norte, CO
2. Conejos River Below Platoro Reservoir, CO
3. Conejos River Near Lasauses, CO
4. Rio Grande Near Lobatos, CO
5. Conejos River Near Mogote, CO
6. San Antonio River At Ortiz, CO
7. Los Pinos River Near Ortiz, CO
8. Azotea Tunnel At Outlet Near Chama, NM
9. Willow C Ab Heron Re Nr Los Ojos, NM
10. Horse Lake C Ab Heron Re Nr Los Ojos, NM
11. Willow Creek Below Heron Dam, NM
12. Rio Chama Below El Vado Dam, NM
13. Rio Chama Below Abiquiu Dam, NM
14. Rio Grande At Otowi Bridge, NM
15. Santa Fe River Near Santa Fe, NM
16. Rio Grande Below COchiti Dam, NM
17. Galisteo Creek Below Galisteo Dam, NM
18. Jemez River Outlet Below Jemez Canyon Dam, NM
19. Rio Grande At Albuquerque, NM
20. Rio Grande Floodway At San Acacia, NM
21. Rio Grande Floodway At San Marcial, NM
22. Rio Grande Below Elephant Butte Dam, NM
23. Rio Grande Blw Caballo Dam, NM