Fourth Annual Report

of the

RIO GRANDE COMPACT COMMISSION

1942

TO THE GOVERNORS OF

Colorado, New Mexico and Texas

Rio Grande Compact Commission

HIS EXCELLENCY, JOHN C. VIVIAN
Governor of the State of Colorado
HIS EXCELLENCY, JOHN J. DEMPSEY
Governor of the State of New Mexico
HIS EXCELLENCY, COKE R. STEVENSON
Governor of the State of Texas

Sirs:

The third annual meeting of the Rio Grande Compact Commission was held in El Paso, Texas, on February 23 and 24, 1942. One other meeting was held in Denver, Colorado, on June 21 and 22, 1942.

At the third annual meeting, the Commission reviewed and adopted as official, records of deliveries and releases, which disclosed that Colorado had accrued credits in its 1941 deliveries at the Colorado-New Mexico State-line, of 127,000 acre feet, and New Mexico accrued credits of 49,400 acre feet at San Marcial, and that the accrued releases of water from Project Storage, was 138,100 acre feet less than allowed by the Compact.

The records of releases from Project Storage show that on most of the days from January 1, 1942 to April 30, 1942, water was released from Elephant Butte Reservoir in excess of Project requirements and was currently passed through Caballo Reservoir in anticipation of spill. On some days in this period water was released from Elephant Butte Reservoir in excess of the quantity released from Caballo Reservoir on the same day; this excess is deemed to have been a transfer of Usable Water from the upper to the lower reservoir, and not water released in anticipation of spill.

If water had not been released from Elephant Butte Reservoir in anticipation of spill, the spillway at Elephant Butte Reservoir would have overflowed on April 30, 1942 in the amount of 7,600 acre feet. Actual Spill is therefore considered to have taken place on this date when the sum of the quantity in storage in Elephant Butte Reservoir plus the aggregate of all releases from that reservoir in anticipation of spill, equalled 2,219,000 acre feet in 1942.

Thereafter, water spilled from Elephant Butte Reservoir or released from that reservoir in excess of Project requirements and currently passed through Caballo Reservoir, was Actual Spill.

The first water so spilled was Credit Water in the aggregate amount of the difference between the total Credit Water of Colorado and New Mexico and the aggregate gain in the

amount of water in storage, prior to the time of spill, in reservoirs above San Marcial constructed after 1929. This gain in storage was 39,900 acre feet, leaving 136,500 acre feet of Credit Water which was physically spilled in 1942.

Commencing on May 12, 1942, all Credit Water of Colorado and New Mexico had been spilled and their credits at the beginning of 1942 had been eliminated.

Usable Water was spilled continuously through July 10, 1942, and intermittently thereafter until October 15, 1942, in the aggregate amount of 470,100 acre feet. Thereafter no water was released from Elephant Butte Reservoir in excess of Project requirements, which was currently passed through Caballo Reservoir.

Prior to October 16, 1942, the minimum quantity in storage in Elephant Butte Reservoir at all times, exceeded 1,830,000 acre feet.

The expenses of Administration during the fiscal year ending June 30, 1942, were $18,026.67, of which $5,800.00 was borne by the United States under cooperative agreements. The balance $12,226.67 was borne equally by the three States in the amount of $4,075.55 each.

Factual data and records bearing upon the administration of the Compact are available in the files of the Commission.

Respectfully yours,

S/M. C. Hinderlider

M. C. HINDERLIDER,
Rio Grande Compact Commissioner
for the State of Colorado

S/Thomas M. McClure

THOMAS M. McCLURE,
Rio Grande Compact Commissioner
for the State of New Mexico

S/J. E. Quaid

J. E. QUAID,
Rio Grande Compact Commissioner
for the State of Texas

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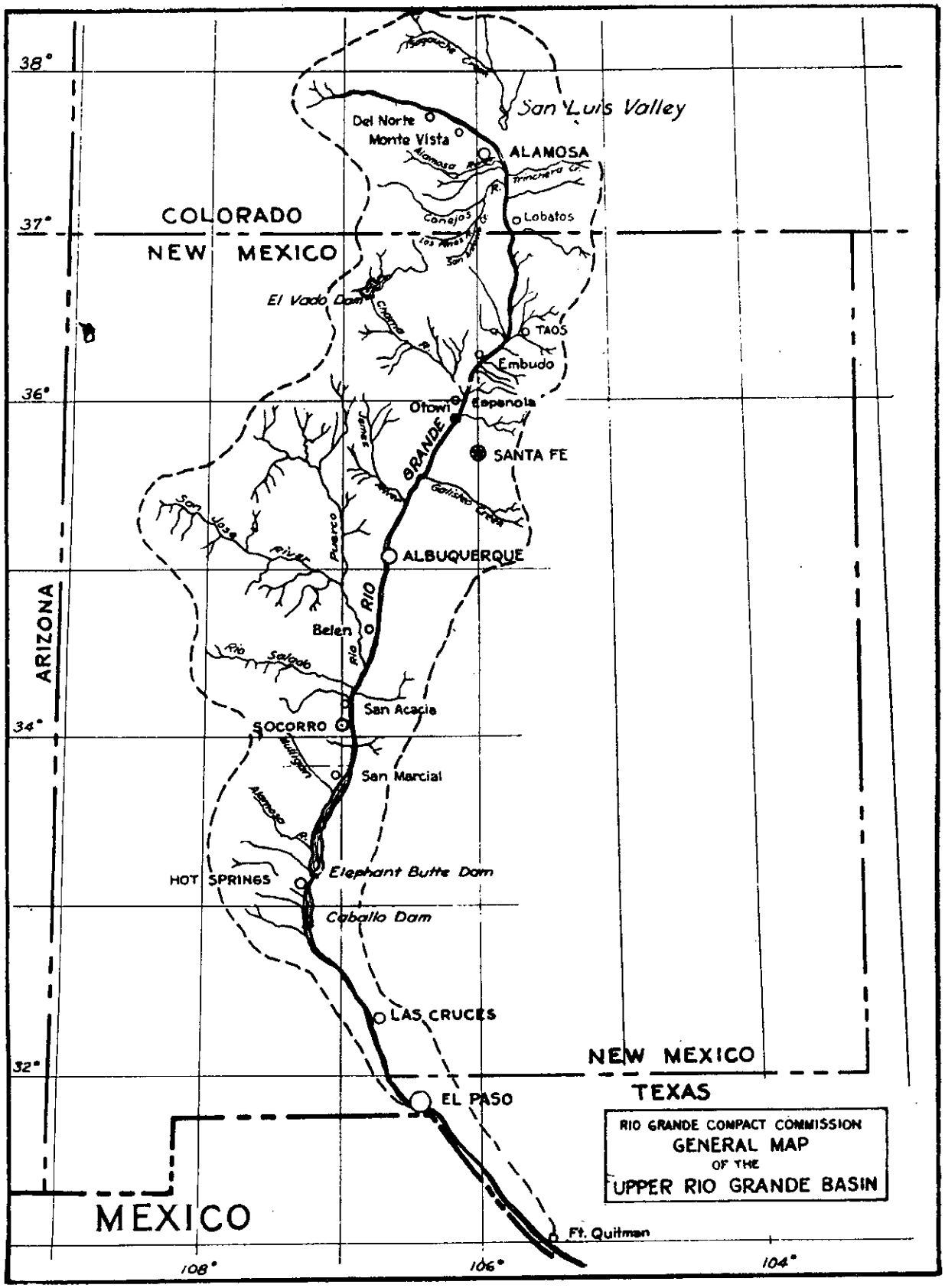
38°
37°
36°
34°
32°
108°
106°
104°
San Luis Valley
Del Norte
Monte Vista
ALAMOSA
Alamosa River
Trinchera Cr.
Conejos R.
Los Pinos R.
San Luis
Conejos
Lobatos
COLORADO
NEW MEXICO
El Vado Dam
Chama R.
TAOS
Embudo
Otowi
Espanola
RIO GRANDE
Tesuque
SANTA FE
Galisteo Creek
San Jose River
Puerco
ALBUQUERQUE
RIO
Belen
Rio Salado
San Acacia
SOCORRO
Rio Puerco
San Marcial
Alamosa R.
HOT SPRINGS
Elephant Butte Dam
Caballo Dam
LAS CRUCES
ARIZONA
NEW MEXICO
TEXAS
EL PASO
MEXICO
Ft. Quitman
RIO GRANDE COMPACT COMMISSION
GENERAL MAP
OF THE
UPPER RIO GRANDE BASIN

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 considertions 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 ac-

tual 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 Reservoir 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 mouth 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.

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
650	182
700	204
750	229
800	257

Rio Grande at Del Norte (3)	Rio Grande at Lobatos less Conejos at Mouths (4)
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;

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
1000	742
1100	839
1200	939
1300	1042
1400	1148
1500	1257
1600	1370
1700	1489
1800	1608
1900	1730
2000	1856
2100	1985
2200	2117
2300	2253

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.

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 others 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.

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 found 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 Unied 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 loses of water to Mexico.

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 affect-

ing 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.

RULES AND REGULATIONS FOR ADMINISTRATION OF THE RIO GRANDE COMPACT

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

Gaging Stations

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 United States Geological Survey.

(b) Gaging stations on streams and reservoirs in the Rio Grande Basin below Lobatos and above San Marcial shall be equipped, maintained and operated by New Mexico in cooperation with the U. S. Geological Survey; the gaging station on the Rio Grande at San Marcial shall likewise be the responsibility of New Mexico to the extent that this station is not maintained and operated by the International Boundary Commission, or some other federal agency.

(c) Gaging stations on Elephant Butte Reservoir and on Caballo Reservoir, and the stream gaging stations on

the Rio Grande below those reservoirs shall be equipped maintained and operated by or on behalf of Texas through the agency of the U. S. Bureau of Reclamation.

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

Reservoir Capacities

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 percent, 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 records of flow of the Rio Grande at San Marcial, at San Acacia, and below Elephant Butte Reservoir may be correlated, 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.

Evaporation Losses

The Commission shall encourage the equipping, maintenance and operation, in cooperation with the United States 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 con-

structed 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.

Adjustments of Records

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

New or Increased Depletions

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

Trans-Mountain 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 allowance shall be made for losses in transit from such points to the Index Gaging Station on the stream with which the imported waters are commingled.

Quality of Water

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

Secretary

The Commission shall employ a secretary who shall be a registered professional engineer, or a Corporate Member of the American Society of Civil Engineers, experienced in irrigation, agricultural or hydraulic engineering. The period of employment of the secretary shall be at the pleasure of the Commission but not exceeding one year, at the end of which period his services shall automatically terminate; provided, however, that the Commission, upon unanimous agreement, may extend his employment for a period not exceeding one year following the year within which his employment has been automatically terminated, or may employ another individual under like conditions with respect to period of employment; it being the intent and puprose of the Commission to limit the term of employment of any such appointee so that any re-appointment, or the appointment of any successor, can be made for a period of but one year, and then only by the unanimous action of the Commission.

The salary of the secretary shall be determined by the Commission. He shall be reimbursed for his necessary traveling expenses incurred in performing his official duties, as may be determined by the Commission.

Each of the respective states, at its own expense, shall provide adequate office facilities for the use of the secretary of the Commission.

It shall be the duty of the secretary to collect and correlate all factual data and other records having a bearing upon the administration of the Compact, and to keep each Commissioner advised thereof. It shall be the further duty of the secretary to inspect all gaging stations maintained by the Commission, and to make recommendations to the Commission as to any changes or improvements to existing stations, and for the addition of new stations, to the end that reliable records may be had for the proper carrying out of the provisions of the Compact.

The secretary shall report to each Commissioner by letter on or before the fifteenth day of each month, except January, a summary of all hydrographic data then available for the current year — on forms prescribed by the Commission — pertaining to:

(a) Deliveries by Colorado at State Line;

(b) Deliveries by New Mexico at San Marcial; and

(c) Release and Spill from Project Storage.

He shall also compile a complete report covering his secretarial activities, and a summary of all factual data required by the Compact during the preceding calendar year, and submit the same to the Commission at its regular meeting in February, first following the calendar year covered by such report.

The secretary shall carry on such other duties as the Commission may assign to him from time to time, and shall devote his entire time to the duties of his office. He shall execute and deliver a surety bond satisfactory to the Commission, conditioned upon the faithful performance of the duties of his office.

Costs

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

Such budget shall set forth the total cost of maintenance and operation 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.

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.

The secretary shall present to each participating state through the Commissioner of such State, a certified statement of one-third of the cost of his salary, traveling expense, the expense incident to the maintenance of the offices of the Commission, and each Commissioner shall arrange for the prompt payment thereof by the appropriate agency of his state.

The Commissioner of each state shall report at the

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

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

Meetings of Commission

The Commission shall meet in February of each year for the consideration and adoption of the annual report for the calendar year preceding, and for the transaction of any other business consistent with its authority. The annual meeting in 1940 shall be held at Monte Vista, Colorado, and thereafter rotate alphabetically according to the states, the place in each state to be designated by the Commissioner from that state. 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.

RECORDS OF DELIVERIES AND RELEASES

Schedules of deliveries by Colorado and New Mexico are set forth in Articles III and IV of the Compact. Certain qualifications and limitations thereto are set forth in Article VI of the Compact. Normal releases from Project Storage are fixed by the Compact at 790,000 acre-feet per year. In February of each year the Commission holds its annual meeting, at which time records of deliveries and releases for the previous calendar year are reviewed and adopted as official. The records adopted by the Commission for 1942 are shown on the following three pages.

By virtue of the fact that there was Actual Spill from Project Storage in an amount greater than Credit Water in storage after deducting the aggregate gain in storage between January 1 and April 30, 1942 in all reservoirs above San Marcial constructed after 1929, no debits or credits were computed. On the other hand and by virtue of Actual Spill from Project Storage the departure from normal of releases from Project Storage were not computed.

Had Actual Spill not occurred the records showed that New Mexico would have a debit for the year of 13,000 acre-feet and an accrued credit of 36,400 acre-feet, at the end of the year. The record also shows that Colorado would have a credit for the year of 150,000 acre-feet by limitation in Article VI of the Compact and an accrued credit of 277,000 acre-feet at the end of the year.

Cooperation in supplying data necessary to making required adjustments to the schedule of deliveries and releases has been received from:

Soil Conservation Service
Agricultural Adjustment Administration
Forest Service
Bureau of Agricultural Economics
Grazing Service
United Pueblos Agency
Weather Bureau

This cooperation is herewith acknowledged.

RIO GRANDE COMPACT

DELIVERIES BY COLORADO AT STATE LINE

YEAR 1942

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	CONEJOS INDEX SUPPLY						RIO GRANDE SUPPLY			STORED WATER		DELIVERIES AND CREDITS			
	MEASURED STREAM FLOW				ADJUSTMENTS PER COMPACT	CONEJOS INDEX SUPPLY	RECORDED FLOW NEAR DEL NORTE	ADJUSTMENTS PER COMPACT	RIO GRANDE INDEX SUPPLY	GAIN (+) OR LOSS (-) IN STORAGE	TOTAL QUANTITY IN STORAGE AT END OF MONTH	CONEJOS RIVER AT MOUTHS NEAR LOS SAUCES	TOTAL FLOW AT LOBATOS LESS CONEJOS RIVER	ACTUAL DELIVERY AT LOBATOS GAGE	ADJUSTMENTS PER COMPACT
	CONEJOS RIVER AT MOGOTE	LOS PINOS RIVER NEAR ORTIZ	SAN ANTONIO RIVER AT ORTIZ	TOTAL MEASURED FLOW											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
JAN	2.5	—	—	2.5	-	2.5	9.4	-	9.4	-	-	5.3	17.0	22.3	
FEB	1.9	—	—	1.9	-	1.9	7.9	-	7.9	-	-	2.9	12.8	15.7	
MAR	3.9	—	—	3.9	-	3.9	14.1	-	14.1	-	-	5.5	27.7	33.2	
1ST QTR.	8.3	—	—	8.3	-	8.3	31.4	-	31.4	-	—	13.7	57.5	71.2	
APR	23.0	18.8	12.1	53.9	-	53.9	66.9	-	66.9	-	-	39.8	79.6	119.4	
MAY	79.8	55.0	14.7	149.5	-	149.5	201.9	-	201.9	0	0.5	83.8	140.7	224.5	
JUN	100.9	26.2	1.4	128.5	-	128.5	280.5	-	280.5	0	0.5	52.7	160.0	212.7	
2ND QTR.	203.7	100.0	28.2	331.9	-	331.9	549.3	-	549.3		—	176.3	380.3	556.6	
JUL	26.3	3.6	0.1	30.0	-	30.0	117.1	-	117.1	0	0.5	1.7	10.6	12.3	
AUG	7.8	1.4	0.1	9.3	-	9.3	75.0	-0.1	74.9	-0.1	0.4	0.5	3.5	4.0	
SEPT	4.3	1.2	0.1	5.6	-	5.6	25.9	-	25.9	0	0.4	1.5	3.2	4.7	
3RD QTR	38.4	6.2	0.3	44.9	-	44.9	218.0	-0.1	217.9	-0.1	—	3.7	17.3	21.0	
OCT	3.3	0.9	0.2	4.4	-	4.4	20.2	-0.1	20.1	-0.1	0.3	1.8	3.4	5.2	
NOV	3.1	—	—	3.1	-	3.1	16.2	-	16.2	0	0.3	1.9	8.5	10.4	
DEC	2.3	—	—	2.3	-	2.3	13.1	-	13.1	0	0.3	3.0	17.8	20.8	
4TH QTR	8.7	0.9	0.2	9.8	-	9.8	49.5	-0.1	49.4	-0.1	—	6.7	29.7	36.4	
YEAR	259.1	107.1	28.7	394.9	-	394.9	848.2	-0.2	848.0	-0.2	—	200.4	484.8	685.2	

REMARKS: Storage in reservoirs constructed after 1937 only.

Adjustments on account of transmountain diversions amounted to less than 50 ac. ft.

Actual Spill occurred in an amount sufficient to spill all credit water.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
C1	Balance at Beginning of Year	—	—	Cr. 127.0
C2	Scheduled Delivery from Conejos River	183.8	—	Dr. 56.8
C3	Scheduled Delivery from Rio Grande	290.6	—	Dr. 347.4
C4	Actual Delivery at Lobatos plus 10000 acre feet	—	695.2	Cr. 347.8
C5	Adjustments per Compact - Item 16			0.0
C6	Reduction of Credits per Article VI	347.8	—	
C7	Reduction of Debits per Article VI	—	—	0.0
C8	Balance at End of Year			

RIO GRANDE COMPACT
DELIVERIES BY NEW MEXICO AT SAN MARCIAL

YEAR 1942

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	OTOWI INDEX SUPPLY					STORAGE OF WATER IN RESERVOIRS					DELIVERIES AND CREDITS				
						LOBATOS TO OTOWI		OTOWI TO SAN MARCIAL					ADJUSTMENTS ACCOUNT DEPLETION DURING JULY, AUGUST, SEPTEMBER		
	RECORDED FLOW AT OTOWI BRIDGE	ADJUSTMENTS ACCOUNT STORAGE ABOVE OTOWI	OTHER ADJUSTMENTS PER COMPACT	EQUIVALENT FLOW AT OTOWI UNDER 1929 CONDITIONS	OTOWI INDEX SUPPLY	GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH	GAIN (+) OR LOSS (-)	TOTAL AT END OF MONTH	TOTAL IN STORAGE AT END OF MONTH	RECORDED FLOW AT SAN MARCIAL GAGE	ACTUAL DELIVERY DURING SCHEDULE MONTHS	LOBATOS TO OTOWI	TRIBUTARIES BELOW OTOWI	OTHER ADJUSTMENTS PER COMPACT
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
JAN	60.6	+2.0	-	62.6	62.6	+2.0	113.5	-0.1	2.3	115.8	72.6	72.6	—	—	
FEB	54.4	+1.1	-	55.5	55.5	+1.1	114.6	+0.3	2.6	117.2	61.7	61.7	—	—	
MAR	115.4	-43.3[b]	-	72.1	72.1	-43.4	71.2	-0.2	2.4	73.6	94.6	94.6	—	—	
1ST QTR	230.4	-40.2	-	190.2	190.2	-40.3	—	0	—	—	228.9	228.9	—	—	
APR	436.1	+80.7	-	516.8	516.8	+80.7	151.9	-0.5	1.9	153.8	432.0	432.0	—	—	
MAY	675.8	+31.9[b]	-	707.7	707.7	+30.7	182.6	-0.5	1.4	184.0	633.0	633.0	—	—	
JUN	442.0	+5.4[b]	-	447.4	447.4	+4.1	186.7	-0.5	0.9	187.6	413.0	413.0	—	—	
2ND QTR	1553.9	+118.0	-	1671.9	1671.9	+115.5	—	-1.5	—	—	1478.0	1478.0	—	—	
JUL	95.2	-49.0[b]	-	46.2	—	-49.9	136.8	-0.8	0.1	136.9	42.2	—			
AUG	73.2	-46.5[b]	+0.1[a]	26.8	—	-47.0	89.8	0	0.1	89.9	34.2	—	0.1[a]	0.5[a]	
SEPT	69.4	-37.6[b]	-	31.8	—	-38.0	51.8	-0.1	0	51.8	52.0	—			
3RD QTR	237.8	-133.1	+0.1[a]	104.8	—	-134.9	—	-0.9	—	—	128.4	—	0.1[a]	0.5[a]	
OCT	46.1	-15.4[b]	-	30.7	30.7	-15.6	36.2	+0.3	0.3	36.5	34.8	34.8	—	—	
NOV	32.6	+3.3[b]	-	35.9	35.9	+3.2	39.4	+0.1	0.4	39.8	19.2	19.2	—	—	
DEC	43.4	+3.0	-	46.4	46.4	+3.0	42.4	+0.2	0.6	43.0	50.1	50.1	—	—	
4TH QTR	122.1	-9.1	-	113.0	113.0	-9.4	—	+0.6	—	—	104.1	104.1	—	—	
YEAR	2144.2	-64.4	+0.1[a]	2079.9	1975.1	-69.1	—	-1.8	—	—	1939.4	1811.0	0.1[a]	0.5[a]	

REMARKS: Storage in reservoirs constructed after 1929 only.

a - Stock Tank consideration.
b - Adjusted for evaporation.

Actual Spill occurred in an amount sufficient to spill all credit water.

SUMMARY OF DEBITS AND CREDITS

	ITEM	DEBIT	CREDIT	BALANCE
NM1	Balance at Beginning of Year	—	—	Cr. 49.4
NM2	Scheduled Delivery at San Marcial	1824.6	—	Dr. 1775.2
NM3	Actual Delivery in Schedule Months	—	1811.0	Cr. 35.8
NM4	Adjustments Account Depletion in July, Aug., Sept.	0.6	—	Cr. 36.4
NM5	Other Adjustments - Item 16			
NM6	Reduction of Credits per Article VI.	36.4	—	0
NM7	Reduction of Debits per Article VI.	—	—	
NM8	Balance at End of Year	—	—	0.0

RIO GRANDE COMPACT
RELEASE AND SPILL FROM PROJECT STORAGE

YEAR 1942

Quantities in Thousands of Acre Feet to Nearest Hundred

MONTH	TOTAL PROJECT STORAGE CAPACITY AVAILABLE AT END OF MONTH	USABLE WATER			UNFILLED CAPACITY OF PROJECT STORAGE AT END OF MONTH	CREDIT WATER			FLOOD WATER IN STORAGE AND DEAD STORAGE AT END OF MONTH	TOTAL WATER IN PROJECT STORAGE AT END OF MONTH	RELEASE AND SPILL				
		STORED IN ELEPHANT BUTTE RESERVOIR	STORED IN CABALLO RESERVOIR	TOTAL IN STORAGE AT END OF MONTH		COLORADO CREDIT WATER IN STORAGE	NEW MEXICO CREDIT WATER IN STORAGE	TOTAL IN STORAGE AT END OF MONTH			RECORDED FLOW OF RIO GRANDE BELOW ELEPHANT BUTTE	RIO GRANDE BELOW CABALLO			TOTAL RECORDED FLOW
												RELEASE OF USABLE WATER	SPILL OF FLOOD OR CREDIT WATER	ACTUAL SPILL OF USABLE WATER	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
JAN	2564.9	1739.5	343.1	2073.6	488.5	127.0	49.4	176.4		2250.0	86.5	4.8			4.8
FEB	2564.9	1698.6	345.9	2044.5	520.4	127.0	49.4	176.4		2220.9	76.3	64.3			64.3
MAR	2564.9	1708.6	315.7	2024.3	510.4	127.0	49.4	176.4		2200.7	66.1	88.7			88.7
1ST QTR.	—	—	—	—	—	—	—	—	—	—	228.9	157.8			157.8
APR	2564.9	1987.8	264.0	2251.8	231.2	92.8	36.1	128.9		2380.6	161.7	204.7	7.6		212.3
MAY	2564.9	2219.0	314.8	2533.8	0	0	0	0	16.0	2549.9	467.4	121.7	128.9	161.8	412.4
JUN	2564.9	2219.0	316.7	2535.7	0				33.9	2569.6	362.8	150.1		203.7	353.8
2ND QTR.	—	—	—	—	—	—	—	—	—	—	991.9	476.5	136.5	365.5	978.5
JUL	2564.9	2055.3	289.0	2344.3	163.7					2344.3	211.9	162.2		71.5	233.7
AUG	2564.9	1968.6	237.7	2206.3	258.6					2206.3	110.1	162.8		15.9	178.7
SEPT	2564.9	1930.9	137.2	2068.1	396.8					2068.1	69.7	175.8		5.7	181.5
3RD QTR.	—	—	—	—	—	—	—	—	—	—	390.8	500.8		93.1	593.9
OCT	2564.9	1878.3	171.6	2049.4	415.0					2049.9	72.1	23.8		11.5	35.3
NOV	2564.9	1814.2	215.2	2029.4	435.5					2029.4	65.5	14.5			14.5
DEC	2564.9	1780.5	264.7	2045.2	438.5					2045.2	69.5	16.0			16.0
4TH QTR.	—	—	—	—	—	—	—	—	—	—	207.1	54.3		11.5	65.8
YEAR	—	—	—	—	—	—	—	—	—	—	1818.7	1189.4	136.5	470.1	1796.0

REMARKS:

ACCRUED DEPARTURE FROM NORMAL RELEASE

	ITEM	DEBIT	CREDIT	BALANCE
P1	Accrued Departure at Beginning of Year	—	—	Cr. 138.1
P2	Actual Release during Year	1189.4	—	Dr. 1051.3
P3	Normal Release for Year	—	790.0	Dr. 261.3
P4	~~Actual Net Evaporation Loss or Year~~ Actual Spill	—	261.3	0
P5	~~Evaporation Loss if No Departure from storage~~	—	—	0
P6	Accrued Departure at End of Year			

TIME OF ~~INUNDATION~~ SPILL April 30, 1942

WATER SUPPLY

Runoff for the year 1942 was, generally, above average on the Rio Grande watershed. It is the first time that uncontrolled spill from Elephant Butte Reservoir has ever occurred.

Accuracy of Records

The Rules and Regulations of the Compact Commission state that the equipment, method and frequency of measurements at each gaging station shall be sufficient to obtain records at least equal in accuracy to those classified as "good" by the U. S. Geological Survey. Within the physical limitations of stream gaging the agencies obtaining records at Compact gaging stations have complied with these regulations.

The station description includes a statement in regard to the general accuracy of the records. "Excellent" indicates that, in general, the daily records are accurate within 5 percent; "good", within 10 percent; "fair", within 15 percent; and "poor", 16 or higher percent. These standards of accuracy are the same as those followed by the Geological Survey.

Acknowledgments

Water supply data contained in the following pages of this report have been supplied by Federal and State agencies, and by several individuals.

The office of the State Engineer of Colorado furnished records of discharge of the following:

Rio Grande near Del Norte
Rio Grande near Lobatos
Conejos River near Mogote
Conejos River near Los Sauces
San Antonio River at Ortiz
Los Pinos River near Ortiz

Records of storage in Troutvale Reservoir No. 2, Squaw Lake and Fuchs reservoir were supplied by Colorado Special Deputy State Engineer at Monte Vista with the cooperation of the respective owners viz: Earl Brown, Craton Sanderson and Fred Fuchs.

The U. S. Geological Survey in cooperation with the New Mexico Interstate Stream Commission furnished the following:

Discharge of Rio Grande at Otowi Bridge
Discharge of Rio Grande at San Acacia
Storage in Carson Reservoir
Storage in San Mateo Reservoir
Discharge of Rio Chama near Tierra Amarilla

The U. S. Geological Survey in cooperation with the New Mexico Interstate Stream Commission and the Middle Rio Grande Conservancy District furnished the record of storage in El Vado Reservoir.

The United Pueblos Agency furnished the records of storage in:

Acomita Reservoir
New Laguna Reservoir
Paguate Reservoir

The United States Section of the International Boundary Commission furnished the records of discharge of the Rio Grande at San Marcial.

The United States Bureau of Reclamation furnished the following records:

Discharge of Rio Grande below Elephant Butte Reservoir
Discharge of Rio Grande below Caballo Reservoir
Storage in Elephant Butte Reservoir
Storage in Caballo Reservoir

The Rio Grande Compact Commission herewith acknowledges the cooperation received from these agencies.

RIO GRANDE COMPACT COMMISSION

RIO GRANDE NEAR DEL NORTE, COLORADO

Location.- In Sec. 30, T. 40, N., R. 5 E., at highway bridge 6 miles west of Del Norte, Pinos Creek enters 5 miles downstream.
Records available.- October 11, 1889, to December 31, 1942.
Gage.- Stevens A-30 recorder in standard shelter equipped with pitcher pump and reservoir flushing device, and street key extending through recorder shelf, constructed during February, 1934, replacing old shelter at same site. Located on right bank just below highway bridge. Elevation of intake is -.06 foot of gage. Reference point is slot in screw on recorder shelf; elevation 10.89 feet above zero of gage. Outside gage is standard chain type range (0-6.7) on downstream side of first span from right end of bridge.
Bench Marks.- No. 1 is spike in tree 12 feet west of shelter. Elevation 7.29 ft. above zero of gage. No. 2 is standard bronze tablet set in concrete post located 60 ft. south of shelter just inside fence. Elevation 5.75 ft. above zero of gage. Zero of gage = 7,982.21 feet above mean sea level.
Control.- Located 150 feet downstream at gravel bar which rarely shifts. Same control for all stages.
Discharge measurements.- (a) Made from cable of 250 ft. span located 1,500 feet upstream; low water measurements made by wading near recorder. (b) Initial point for sounding is left bank of river. (c) Bed composed of coarse gravel and small boulders. (d) One channel at all stages, depth of water at extreme low stage 0.5 ft. Flow fairly smooth and well distributed in cross-section. (e) Channel straight for half mile above and below station. (f) Banks low and covered with brush. Highway grade prevents overflow around bridge at stage less than 5.5 ft. at left end, and 6.2 ft. at right end. (g) Conditions favorable for accurate measurements.
Floods.- See official records of State Engineer's office.
Zero flow.- Not determined.
Winter flow.- Ice forms complete cover.
Regulations.- Flow regulated by reservoirs on headwaters.
Diversions.- Few small diversions for irrigation above station.
Accuracy.- With gage heights from recorder, favorable measuring conditions, and frequent measurements to define slight changes in control, records are excellent.
Cooperation.- Station maintained by the State Engineer in cooperation with U.S.G.S.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	164	140	140	374	1,270	5,510	2,520	1,570	905	275	344	215
2	158	147	142	547	1,340	5,400	2,390	1,630	706	275	332	159
3	154	150	145	603	1,260	5,280	2,320	1,630	540	270	326	143
4	152	160	151	666	1,320	5,280	2,300	1,620	505	260	320	132
5	149	170	149	746	1,620	5,190	2,360	1,550	526	255	296	125
6	150	160	142	861	1,700	5,330	2,370	1,560	491	250	296	121
7	178	154	145	642	2,020	5,740	2,270	1,450	446	250	302	131
8	205	152	150	498	2,360	4,890	2,190	1,280	416	245	285	149
9	217	148	170	618	2,630	4,960	2,100	1,140	398	235	308	172
10	200	137	200	738	3,170	5,650	1,970	1,100	386	245	285	200
11	185	140	215	1,080	3,270	5,970	1,920	1,150	477	326	280	230
12	170	144	210	1,070	3,340	6,180	1,760	1,180	596	368	290	244
13	163	138	220	1,030	2,720	5,880	1,730	1,330	512	356	296	246
14	158	127	235	1,530	2,320	5,650	1,840	1,330	470	362	296	246
15	145	123	255	1,600	2,220	5,030	1,870	1,240	464	368	296	250
16	138	117	245	1,380	2,210	4,960	1,980	1,180	446	368	290	258
17	137	105	230	1,520	2,240	5,140	2,050	1,160	422	368	250	262
18	137	99	245	1,270	2,140	5,210	2,020	1,140	398	362	245	264
19	136	100	290	960	2,270	5,330	2,050	1,160	374	344	240	262
20	135	112	290	927	2,540	5,070	1,830	1,150	362	332	250	250
21	135	170	265	1,030	3,100	4,710	1,660	1,140	350	326	215	237
22	135	178	270	1,360	3,700	4,390	1,620	1,050	344	326	225	223
23	132	170	280	1,970	4,050	3,970	1,600	1,050	344	338	285	215
24	132	166	280	1,780	4,850	3,720	1,590	1,060	344	374	255	300
25	132	154	270	1,590	5,140	3,150	1,570	1,060	332	386	255	280
26	135	150	250	1,600	5,860	2,790	1,550	1,020	326	392	205	230
27	138	147	245	1,460	6,670	2,860	1,550	1,000	314	404	210	199
28	142	141	265	1,490	6,280	2,720	1,600	993	302	398	260	208
29	145		330	1,430	6,230	2,860	1,590	971	285	422	205	222
30	145		340	1,340	6,160	2,590	1,530	971	280	398	230	229
31	153		360		5,510		1,340	938		320		210

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	4,755	217	132	153	9,430
February	3,999	178	99	143	7,930
March	7,124	360	140	230	14,130
April	33,710	1,970	374	1,124	66,860
May	101,810	6,670	1,260	3,284	201,900
June	141,410	6,180	2,590	4,714	280,500
July	59,040	2,520	1,340	1,905	117,100
August	37,803	1,630	938	1,219	74,980
September	13,061	905	280	435	25,910
October	10,198	422	235	329	20,230
November	8,172	344	205	272	16,210
December	6,612	300	121	213	13,110
Year	427,694	6,670	99	1,172	848,290

RIO GRANDE COMPACT COMMISSION

RIO GRANDE NEAR LOBATOS, COLORADO

Location.- In Sec. 22, T. 33 N., R. 11 E., at highway bridge 6 miles north of State line and 10 miles east of Lobatos.
Records available.- June 28, 1899, to December 31, 1942.
Gage.- Stevens A-35 recorder in cobblestone well 5 feet square located on right bank under bridge. On well a timber shelter was constructed in March 1934, replacing former shelter. A pitcher pump and reservoir flushing device were installed. Reference point is slot in screw, set in edge of recorder shelf. Elevation 12.69 feet above zero of gage. Outside gage (0-6.7') is chain on bridge. The intake has an elevation of -.05 foot. Zero of gage is 7,426.79 ft. above mean sea level.
Bench Marks.- No. 1 is point on rock (marked with red paint) located in front of shelter. Elevation 7.40 ft. above zero of gage. No. 2 is standard bronze tablet in concrete post located at base of cliff 75 ft. downstream from shelter. Elevation is 8.29 ft. above zero of gage.
Control.- No well defined control.
Discharge measurements.- (a) Made from two span highway bridge; low water measurements made by wading at riffle ¼ mile upstream. (b) Initial point is left end of upstream handrail. (c) Bed composed of large boulders embedded in silt and is fairly permanent. (d) One channel at all stages, flow smooth and well distributed in cross-section; velocity varies from 0.5 foot per second at low stage to 5 feet per second at high stages. (e) Channel curves slightly 200 feet upstream, and is straight for 2000 feet downstream. (f) River is in a small canyon which prevents overflow. (g) Conditions favorable for accurate measurements.
Floods.- See official records of State Engineer's office.
Point of zero flow.- Not determined.
Regulations.- Flow regulated somewhat by reservoirs on headwaters, and diversions for irrigation.
Diversion.- Numerous diversions for irrigation above station.
Accuracy.- With gage heights from recorder, favorable measuring conditions, and frequent measurements to define slight changes in stage-discharge relation, records are excellent.
Cooperation.- Station maintained by State Engineer in cooperation with U.S.G.S.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	470	310	390	588	2,920	4,860	530	68	71	61	96	297
2	480	310	380	588	2,730	4,510	447	66	93	66	99	302
3	500	310	370	573	2,640	4,150	402	74	85	71	106	347
4	520	310	370	611	2,500	4,250	370	76	88	71	110	302
5	540	310	380	805	2,480	4,170	364	88	106	71	106	302
6	560	310	340	892	2,710	4,070	359	76	110	68	113	287
7	570	310	320	1,050	3,000	4,090	341	74	106	68	110	195
8	580	310	360	1,040	3,400	4,320	287	74	110	68	110	308
9	580	310	400	1,040	3,850	4,520	261	68	110	68	113	292
10	570	310	470	955	4,280	4,950	218	66	106	68	113	308
11	450	250	510	946	4,800	5,050	195	58	106	71	110	292
12	400	250	600	1,140	5,240	5,410	190	63	103	79	113	276
13	350	250	682	1,410	5,410	5,080	204	63	90	90	134	287
14	330	250	698	1,550	4,800	4,910	195	82	82	85	130	287
15	325	250	690	1,860	3,990	4,960	177	71	79	82	155	347
16	305	250	603	2,270	3,260	4,570	151	68	82	82	223	402
17	290	250	666	2,610	2,720	4,120	155	63	79	79	209	408
18	275	250	596	2,860	2,520	3,610	147	66	71	79	190	376
19	270	250	627	2,970	2,360	3,420	134	61	63	85	209	376
20	250	250	642	2,710	2,330	3,430	130	61	66	99	209	395
21	230	290	603	2,270	2,430	3,430	123	61	61	99	209	402
22	225	290	603	2,150	2,680	3,320	116	58	58	103	204	408
23	220	290	642	2,820	3,160	2,970	99	54	58	103	204	382
24	200	290	698	3,750	3,610	2,480	90	56	58	99	223	341
25	205	290	706	4,020	3,860	1,960	85	54	58	88	232	330
26	220	290	635	3,690	4,340	1,510	79	61	58	85	228	370
27	235	290	558	3,540	4,610	1,050	74	66	58	96	276	341
28	260	290	515	3,350	5,080	780	74	63	58	96	287	335
29	265		522	3,100	5,030	714	68	56	58	110	276	402
30	270		573	3,040	5,270	580	66	54	58	113	324	414
31	300		603		5,170		63	54		96		389

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	11,245	580	200	363	22,300
February	7,920			283	15,710
March	16,752	706	320	540	33,210
April	60,208	4,020	573	2,007	119,400
May	113,180	5,410	2,330	3,651	224,500
June	107,244	5,410	580	3,575	212,700
July	6,194	530	63	200	12,290
August	2,023	88	54	65.3	4,010
September	2,389	110	58	79.6	4,740
October	2,599	113	61	83.8	5,160
November	5,221	324	96	174	10,360
December	10,500	414	195	339	20,830
Year	345,475	5,410	54	946	685,210

RIO GRANDE COMPACT COMMISSION

RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N. MEX.

Location.- Water-stage recorder, Lat. 35°52'25", N., Long. 106°08'35", W., in San Ildefonso Pueblo Grant, 100 feet downstream from highway bridge, 1 3/4 miles southwest of San Ildefonso Pueblo, 2½ miles downstream from Rio Pojoaque, and 7 miles west of Pojoaque (revised). Datum of gage is 5,488.48 feet above mean sea level, datum of 1929.

Drainage area.- 14,300 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colorado).

Records available.- February 1895 to December 1905, June 1909 to December 1914, October 1930 to September 1942 in reports of Geological Survey. February 1895 to December 1905, June 1909 to December 1931 in reports of State engineer. January 1941 to December 1942 in reports of Rio Grande Compact Commission.

Average Discharge.- 15 years (1927-42), 1,667 second-feet.

Extremes.- Maximum discharge during year, 16,400 second-feet Apr. 23 (gage height, 10.22 feet); minimum daily, 735 second-feet Jan. 6.
1930-42: Maximum discharge, 22,500 second-feet May 16, 1941; maximum gage height, 13.70 feet May 14, 1941; minimum daily discharge, 128 second-feet June 21, 1934.

Remarks.- Records good except those for periods of missing or doubtful gage-height record, which are fair. Flow partially regulated by operation of El Vado Reservoir on upper Rio Chama which stores water for irrigation. Diversions above station for irrigation.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,090	1,010	982	2,480	7,520	12,500	1,870	2,000	1,400	945	592	655
2	1,070	1,040	926	2,620	8,750	11,600	1,990	1,440	1,400	945	538	632
3	910	1,050	942	3,040	8,850	11,100	1,700	1,300	1,360	945	508	632
4	950	1,040	1,030	3,340	8,580	11,600	1,640	1,540	1,420	915	508	705
5	819	1,040	1,200	3,850	8,580	11,400	1,590	1,350	1,470	915	512	832
6	735	1,030	1,290	5,060	8,850	10,800	1,490	1,580	1,210	915	516	805
7	882	1,040	1,330	4,130	9,410	10,200	1,540	1,450	1,210	888	512	780
8	875	1,040	1,120	3,680	10,500	9,690	1,810	1,360	1,180	805	512	680
9	926	1,050	1,010	3,680	11,400	9,690	1,760	1,320	1,140	780	508	592
10	868	1,050	1,230	3,940	13,000	9,130	1,810	1,290	1,100	780	492	524
11	889	1,030	1,770	4,620	13,900	8,850	1,870	1,140	1,440	780	492	655
12	966	1,050	1,520	5,400	14,700	8,310	1,930	1,100	1,490	805	492	680
13	1,020	1,010	2,030	4,950	15,600	8,580	1,810	1,270	1,210	805	492	705
14	1,080	1,040	2,890	4,800	14,700	8,310	1,700	975	1,100	832	492	705
15	1,040	1,020	2,450	6,720	12,600	8,040	1,640	1,100	1,010	805	496	730
16	1,010	950	2,260	7,540	9,410	8,310	1,590	1,040	975	755	512	730
17	1,130	903	2,190	8,790	9,410	8,310	1,640	1,180	945	805	520	730
18	1,100	791	2,070	11,400	9,130	7,780	1,490	1,040	915	805	552	730
19	1,030	889	2,260	10,100	8,580	6,520	955	975	1,010	780	570	755
20	1,010	861	2,190	9,110	9,470	5,710	1,330	945	1,180	730	565	730
21	982	942	2,130	8,160	9,970	5,820	1,330	915	1,140	632	570	730
22	982	990	2,190	8,160	10,200	5,380	1,390	915	1,140	596	578	730
23	990	958	2,380	13,200	10,200	5,060	1,440	1,010	1,100	583	588	705
24	1,020	903	2,730	15,000	11,100	4,460	1,440	1,250	1,100	592	588	705
25	982	903	2,380	11,600	11,600	3,900	1,440	1,100	1,100	601	592	780
26	998	918	2,320	11,900	11,600	3,310	1,340	832	1,070	592	610	805
27	1,010	910	2,260	11,600	12,200	2,780	1,260	915	1,070	588	601	755
28	1,040	982	2,190	11,100	12,500	2,170	1,260	1,010	1,100	574	601	705
29	1,060		2,260	10,200	12,800	1,870	1,290	1,100	1,040	578	610	610
30	1,050		2,300	9,690	12,800	1,640	1,290	1,210	975	592	680	680
31	1,050		2,360		12,800		1,330	1,250		596		705

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	30,564	1,130	735	986	60,620
February	27,440	1,050	791	980	54,430
March	58,190	2,890	926	1,877	115,400
April	219,860	15,000	2,480	7,328	436,100
May	340,710	15,600	7,520	10,990	675,800
June	222,820	12,500	1,640	7,427	442,000
July	47,965	1,990	955	1,547	95,140
August	36,902	2,000	832	1,190	73,190
September	35,000	1,490	915	1,167	69,420
October	23,259	945	574	750	46,130
November	16,399	680	492	547	32,530
December	21,897	832	524	706	43,430
Year	1,081,006	15,600	492	2,962	2,144,190

RIO GRANDE BASIN

RIO GRANDE AT SAN ACACIA, N. MEX.

Location.- Water-stage recorders on right (not used for 1942) and left banks, Lat. 34°15' N., Long 106°53' W., in NE¼ Sec. 1, T. 1 S., R. 1 W., 0.2 mile downstream from San Acacia diversion dam, half a mile east of San Acacia, and 2 miles downstream from Rio Salado. Datum of right bank gage is 4,662.56, left bank gage 4,660.16 feet above mean sea level, datum of 1929.

Drainage area.- 26,770 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.)

Records available.- April 1936 to September 1942 in reports of Geological Survey. February to December 1925, January 1926 to September 1927 (gage heights and discharge measurements only) in reports of State engineer. January 1941 to December 1942 in reports of Rio Grande Compact Commission.

Extremes.- Maximum discharge during year, 26,100 second-feet Oct. 25 (gage height 7.10 feet); minimum daily, 180 second-feet Aug. 23.

1936-42: Maximum discharge, 27,400 second-feet Aug. 5, 1936 (gage height, 8.35 feet, datum of gage was 4,662.56 feet), from rating curve extended above 18,000 second-feet by logarithmic plotting; minimum daily, 1 second-foot June 23, 1939.

Remarks.- Records good. Socorro main canal north diverts 0.2 mile above gage. Diversions for irrigation above station.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,250	1,040	1,170	1,780	9,660	11,700	1,290	305	544	566	312	354
2	1,210	1,170	1,130	1,880	8,440	10,600	1,500	364	657	540	328	518
3	1,370	1,120	1,150	1,910	9,350	10,300	1,250	1,150	553	485	402	529
4	1,330	888	888	2,400	9,660	11,300	1,170	790	760	727	485	507
5	1,130	1,030	837	3,550	8,440	12,400	1,060	474	905	518	420	605
6	1,120	1,040	888	4,270	8,160	11,700	1,060	354	973	566	373	657
7	1,120	1,010	1,120	4,890	7,600	11,300	956	618	1,120	496	335	854
8	1,210	1,030	1,480	5,420	9,040	9,660	644	689	990	430	254	1,060
9	871	973	1,210	4,270	10,600	9,350	592	507	507	496	268	837
10	1,010	1,100	973	3,920	12,400	8,740	540	644	392	441	236	854
11	1,250	1,230	871	4,150	12,700	7,870	631	715	598	504	298	775
12	1,210	1,230	790	5,070	11,400	8,740	854	775	1,840	516	242	715
13	1,170	1,040	1,170	6,280	13,900	9,040	871	715	3,400	730	190	790
14	1,210	1,100	1,520	6,540	13,100	9,040	1,100	631	1,640	553	206	871
15	1,100	1,060	1,580	5,940	13,900	8,160	715	592	1,200	507	224	837
16	1,150	1,010	2,550	5,650	13,500	7,600	553	566	973	605	206	820
17	1,150	820	2,370	8,090	10,300	7,060	631	905	905	801	165	837
18	1,150	888	1,990	9,980	9,350	6,330	685	685	730	972	224	888
19	1,010	939	1,660	11,600	9,350	5,070	670	328	775	805	195	905
20	1,040	990	1,410	11,400	7,870	5,110	775	248	644	888	212	1,030
21	1,130	939	1,810	9,040	8,440	4,980	973	248	888	730	290	973
22	1,190	905	2,200	8,740	10,300	4,850	463	206	700	592	290	990
23	1,080	905	2,170	9,980	11,000	4,110	344	180	605	553	236	939
24	1,030	1,040	1,590	13,300	10,300	4,070	328	1,200	566	566	430	990
25	1,060	990	2,090	19,500	11,000	3,840	452	990	579	496	373	1,130
26	956	973	2,260	16,000	11,000	3,300	507	618	566	402	290	1,010
27	973	922	2,150	10,300	12,000	2,640	592	452	518	441	282	1,010
28	1,040	1,130	2,060	11,300	11,700	2,060	715	529	474	463	282	1,010
29	1,060		1,820	10,300	11,700	1,960	922	575	715	441	254	1,080
30	1,060		1,960	11,000	11,300	1,610	485	402	605	344	320	956
31	1,010		1,330		13,100		260	354		298		775

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	34,650	1,370	871	1,118	68,730
February	28,512	1,230	820	1,018	56,550
March	48,197	2,550	790	1,555	95,600
April	228,450	19,500	1,780	7,615	453,100
May	330,560	13,900	7,600	10,660	655,700
June	214,490	12,400	1,610	7,150	425,400
July	23,588	1,500	260	761	46,790
August	17,809	1,200	180	574	35,320
September	26,322	3,400	392	877	52,210
October	17,412	972	298	562	34,540
November	8,622	485	165	287	17,100
December	26,106	1,130	354	842	51,780
Year	1,004,718	19,500	165	2,753	1,992,820

RIO GRANDE COMPACT COMMISSION

RIO GRANDE AT SAN MARCIAL, NEW MEXICO

Description.- Water-stage recorder and cable with sit-down cable car and winch located at railroad bridge about one mile below San Marcial, New Mexico, and 177.1 miles above the American Dam at El Paso, Texas. The recorder is on the upstream end of the first bridge pier from the south abutment of the bridge and the zero of its gage is 4,455.38 feet, United States Coast and Geodetic Survey sea level datum. The recorder was moved to the downstream end of the south abutment of the bridge on May 26, 1942. Zero of this gage is 4,459.08 feet (same datum). The recorder was returned to the original location on July 1, 1942.

Records.- Based upon 133 meter measurements, by wading, and from cable about 1,000 feet above railroad bridge (125 measurements by I.B.C. and 8 by U.S.G.S.). Computations by shifting channel methods. 1942 records good. Records available: January 1895 to December 1942.

Remarks.- For gage history 1895 to 1938 see Water Bulletins Nos. 4, 7 and 8. Since April 1937 the river has been flowing through the Val Verde area, but on July 16, 1942 it returned to its old channel and is now passing under the highway bridge. See Water Bulletin No. 7.

El Vado and smaller reservoirs and many irrigation diversions and drainage returns above this station in Colorado and New Mexico modify the river flow.

Comparative flows from records.- Momentary Peak: Max., Oct. 11, 1904, 50,000 sec. ft. with water surface level of 4,459.5 ft. on U.S.C. and G.S. datum about .25 mile above the present station gage. This is the greatest flood peak flow in at least the past 114 years, or since 1828. Min., sometimes dry. See Water Bulletin No. 6, page 79, for large peak flows since 1828 and their average frequency. Daily: Max., Oct. 11, 1904, 33,000 sec. ft. average. Min., sometimes dry. Monthly: Max., May 1941, 16,159 sec. ft. average. Min., sometimes dry. Yearly: Max., 1941, 3,911 sec. ft. average. Min., 1902, 277 sec. ft. average. Two Successive Years: Max., 1941 and 1942, 3,300 sec. ft. average. Min., 1899 and 1900, 487 sec. ft. average. Three Successive Years: Max., 1905 to 1907, 2,830 sec. ft. average. Min., 1900 to 1902, 609 sec. ft. average. Four Successive Years: Max., 1905 to 1908, 2,390 sec. ft. average. Min., 1899 to 1902, 539 sec. ft. average. Five Successive Years: Max., 1905 to 1909, 2,260 sec. ft. average. Min., 1898 to 1902, 697 sec. ft. average. Ten Successive Years: Max., 1903 to 1912, 1,980 sec. ft. average. Min., 1931 to 1940, 1,140 sec. ft. average. Forty-Eight Year average: 1,580 sec. ft.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,360	1,140	1,170	1,540	10,500	11,900	1,190	320	354	580	422	304
2	1,340	1,200	1,100	1,670	9,620	10,700	1,190	366	465	515	376	298
3	1,320	1,190	940	1,820	8,310	11,700	1,400	447	557	506	352	455
4	1,290	1,190	845	2,030	9,210	11,300	1,150	921	437	485	411	473
5	1,250	1,050	945	2,810	9,050	10,800	1,060	710	799	497	543	497
6	1,160	1,180	833	3,890	7,960	10,700	950	509	992	377	480	447
7	1,160	1,210	930	4,930	7,770	10,400	834	425	710	494	412	645
8	1,110	1,160	1,450	5,850	8,070	9,850	915	650	1,030	616	366	785
9	1,000	1,030	1,680	4,640	8,710	9,200	575	845	893	499	318	846
10	945	1,210	1,740	4,230	9,570	8,700	478	553	533	464	265	904
11	1,180	1,450	1,120	3,940	10,800	7,780	423	653	395	485	309	852
12	1,500	1,330	760	4,350	11,700	7,400	639	971	1,220	606	331	849
13	1,240	1,150	790	5,130	12,600	7,550	656	726	2,800	630	331	750
14	1,200	1,040	1,210	5,810	14,400	7,580	640	580	2,750	825	237	707
15	1,120	1,170	1,540	5,790	14,400	8,260	846	437	1,560	681	226	725
16	1,140	1,120	1,990	5,230	13,600	7,140	648	428	1,100	556	243	828
17	1,200	1,140	2,800	6,110	12,000	6,500	668	519	959	624	236	841
18	1,200	1,050	2,150	7,710	9,350	6,310	536	722	844	727	231	874
19	1,180	980	1,910	9,510	8,840	5,630	604	625	840	821	246	944
20	1,230	1,010	1,890	11,600	8,540	4,960	596	438	733	796	259	924
21	1,300	1,010	1,600	11,300	8,300	4,490	475	299	666	814	232	990
22	1,200	900	1,800	10,000	8,810	4,680	678	247	708	666	237	1,020
23	1,140	850	1,960	9,050	9,470	4,610	530	221	779	589	251	969
24	1,080	915	1,670	9,080	10,200	3,980	313	279	668	573	250	968
25	1,110	1,110	1,380	12,900	10,400	3,790	316	1,030	650	522	319	968
26	1,120	1,130	1,850	17,800	10,700	3,490	372	955	532	486	428	1,020
27	1,100	1,110	2,200	14,500	10,900	2,690	349	564	505	384	402	1,080
28	1,100	1,100	1,960	12,000	10,800	2,370	377	445	534	390	348	1,110
29	1,080		1,950	11,600	11,000	2,110	586	481	488	488	315	1,150
30	1,100		1,730	10,900	11,700	1,840	709	469	734	407	282	1,010
31	1,130		1,790		11,900		564	402		418		1,030

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	36,585	1,580	880	1,180	72,600
February	31,125	1,600	825	1,110	61,700
March	47,683	4,160	700	1,540	94,600
April	217,720	18,400	1,410	7,260	432,000
May	319,180	15,100	7,400	10,300	633,000
June	208,410	12,100	1,580	6,950	413,000
July	21,267	1,480	290	686	42,200
August	17,237	1,490	177	556	34,200
September	26,225	4,230	318	874	52,000
October	17,521	872	326	565	34,800
November	9,658	572	207	322	19,200
December	25,263	1,300	250	815	50,100
Year	977,874	18,400	177	2,679	1,939,400

RIO GRANDE COMPACT COMMISSION

RIO GRANDE BELOW ELEPHANT BUTTE DAM

Location.- SW¼, Sec. 25, T. 13 S., R. 4 W., (map projection of land survey into Pedro Armendariz Grant) approximately 5500 feet downstream from Elephant Butte Dam outlets.

Metering Equipment.- 3/4" diameter tramway cable - approximately 177 feet between wooden "A" frames equipped with sit-down car and reel.

River Section.- Section under cable regular gravel-sand bottom. Flow approaches cable at right angle at all stages. Channel dredged winter of 1938-39 connection power plant construction.

Control.- Control is slight river section constriction about 1150 feet below gage occasioned by bridge, and confinement of river channel between hill and road grade. Flood discharge into river from Mescal Canyon and Cuchillo Creek, about one mile below gage, would cause backwater conditions at gage. Accuracy not affected as time of such conditions always known and compensated for by additional meter measurements as needed.
No appreciable inflow occurs between location abandoned April 23, 1942 and new gage 0.7 mile downstream. Several small arroyos enter river above present gage and the one abandoned, but inflow occurs only once or twice during rainy season for periods of only 1/4 to 1/2 hour at time. This volume is small and can always be accurately eliminated from record at times of occurrence.

Regulation.- Flow is completely regulated by storage in Elephant Butte Reservoir. Varying river flow depending entirely upon flow thru power plant, or gate control at the dam.

Accuracy.- Records excellent.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	1,210	1,390	1,000	6,340	8,050	5,500	3,610	1,500	1,280	1,050	1,120
2	1,410	1,450	1,470	1,030	6,450	8,000	5,380	3,620	1,370	1,230	1,090	1,200
3	1,460	1,490	1,510	1,010	6,510	7,830	4,540	3,740	1,200	1,210	1,100	1,150
4	1,340	1,460	1,420	1,010	6,680	6,530	3,950	3,720	1,260	1,080	1,090	1,120
5	1,420	912	1,490	938	6,720	6,350	3,930	2,980	1,230	1,190	1,100	1,160
6	1,450	1,370	1,310	986	6,720	6,280	4,040	1,620	1,050	1,250	1,100	1,050
7	1,450	1,290	1,030	1,020	6,570	6,200	4,060	1,500	1,170	1,230	1,120	1,140
8	1,370	1,260	1,010	1,090	6,900	6,250	4,080	1,410	1,230	1,190	1,040	1,550
9	1,370	1,380	1,040	1,020	7,430	6,160	4,080	1,290	1,200	1,160	1,090	1,670
10	1,370	1,320	1,050	1,110	7,430	6,420	2,770	1,390	1,190	1,240	1,140	1,410
11	1,310	1,410	1,040	1,320	7,560	6,360	1,640	1,500	1,100	957	1,110	1,090
12	1,410	1,420	1,010	1,350	7,950	6,350	1,530	1,540	1,200	432	1,150	1,040
13	1,440	1,430	970	1,790	7,850	6,180	1,590	1,500	937	1,280	1,130	955
14	1,440	1,420	1,000	2,670	7,920	6,140	1,640	1,470	1,100	1,280	1,080	963
15	1,430	1,330	897	2,590	7,980	6,290	1,620	1,040	1,190	1,250	971	958
16	1,430	1,400	961	2,730	8,040	6,210	1,640	1,350	1,150	1,160	1,100	1,080
17	1,430	1,350	994	2,630	7,980	6,150	2,480	1,510	1,140	1,240	1,140	1,100
18	1,340	1,410	998	2,610	8,040	6,200	3,750	1,550	1,140	1,190	1,160	1,080
19	1,400	1,380	998	2,500	8,110	5,970	3,660	1,570	1,140	1,190	1,110	1,100
20	1,410	1,290	1,010	2,740	8,160	5,510	3,720	1,570	1,030	1,190	1,120	1,090
21	1,410	1,390	1,030	3,240	8,190	5,180	3,810	1,590	1,100	1,190	1,110	1,090
22	1,410	1,350	913	3,130	8,220	5,310	3,710	1,490	1,130	1,240	1,010	1,050
23	1,440	1,420	906	3,620	8,000	5,620	3,810	1,320	1,130	1,240	1,120	1,070
24	1,430	1,470	1,040	4,090	8,070	5,360	3,920	1,430	1,160	1,140	1,160	1,110
25	1,320	1,460	983	4,650	8,140	5,440	3,720	1,470	1,180	1,110	1,100	911
26	1,440	1,430	957	4,930	8,100	5,370	3,610	1,490	1,200	1,190	1,070	1,010
27	1,430	1,480	996	5,650	8,100	5,290	3,680	1,490	1,110	1,220	1,130	1,020
28	1,420	1,480	973	6,300	8,020	5,070	3,640	1,470	1,170	1,190	1,170	1,110
29	1,390		950	6,440	7,820	5,260	3,670	1,480	1,210	1,220	1,060	1,110
30	1,460		978	6,330	7,850	5,610	3,620	1,360	1,220	1,170	1,100	1,330
31	1,440		1,030		7,780		3,570	1,460		1,190		1,200

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	43,620	1,460	1,310	1,407	86,520
February	38,462	1,490	912	1,374	76,290
March	33,354	1,510	897	1,076	66,160
April	81,524	6,440	938	2,717	161,700
May	235,630	8,220	6,340	7,601	467,370
June	182,940	8,050	5,070	6,098	362,860
July	106,360	5,500	1,530	3,431	210,960
August	55,530	3,740	1,040	1,791	110,140
September	35,137	1,500	937	1,171	69,690
October	36,329	1,280	432	1,172	72,060
November	33,021	1,160	971	1,101	65,500
December	35,037	1,670	955	1,130	69,490
Year	916,944	8,220	432	2,512	1,818,700

RIO GRANDE COMPACT COMMISSION

RIO GRANDE BELOW CABALLO DAM

Location.- In the NE¼SW¼ Sec. 30, T. 16 S., R. 4 W., N.M.P.M., approximately 4200 feet below Caballo Dam in Sierra County, N. Mex.; and about 20 miles south of Hot Springs, N. Mex. and approximately 102 miles northwest of El Paso, Texas.

Control.- No permanent control exists in the immediate vicinity of gage. A long range control is located 7000 ft. below the gage. This control is Percha Diversion Dam. In the immediate vicinity of the gage the Bojorquez bridge, 600 ft. below the gage, and an old semi-permanent delta of Percha Arroyo below the highway bridge acts as partial control. Moving sand causes discharge-gage relationship to be of a shifting nature. Shifts, however, are moderate. Sensitivity is good.

Discharge measurements.- Discharge measurements are made from a cable with a sit-down car equipped with reel. Measuring section is good, but was subject to considerable scour during spill from Caballo Dam April, May, June and July, 1942 during which period maximum mean daily discharge was 7650 sec.ft. Infrequently during summer months in past years check measurements were made from a cable located about 3/4 mile below Percha Dam and approximately 2 miles below the Caballo station. To this was added a measurement of the flow of the Arrey Canal; the sum representing a check on the Caballo station. As a result of spill from Caballo Dam water began flowing around the west end of the Caballo cable station April 26, 1942. Current meter measurements were made on April 28 and April 29, 1942 at the cable below Percha Dam and on the Arrey Canal. A sudden change in the river flow direction washed out the cable below Percha Dam on May 1, 1942. A new cable site was located and a measuring cable was installed about 7 miles downstream from the Caballo station. The first measurement at this, the Derry cable station, was made May 14, 1942. The section was regular, approach at right angles, bottom sand, results very satisfactory. Measurements were made at Derry until May 23, 1942. The highest discharge from Caballo during the period was therefore measured. Beginning May 24, 1942 measurements were again possible at the Caballo station. During this entire period of high discharge from Caballo reservoir an auxiliary gage was maintained at Percha Dam in order to check against the Caballo gage. The records during this flood period were considered excellent as a result of the checks made. Consequently all records during the period continue to be referred to the regular Caballo station gage.

Regulation.- The flow is regulated by storage in the Caballo Dam 4200 ft. upstream from the station. A small arroyo enters the river from the east side approximately 1500 ft. above the gage. This arroyo contributes momentary flood peaks 100-300 c.f.s. once or twice a year during the rainy season. However, this volume of water is relatively small and it is always possible to properly account for it.

Records available.- Records began at station February 8, 1938 but prior to this date discharge records are available for the Rio Grande at Percha Dam since 1922. Percha Dam is a diversion weir located about 2 miles below Caballo Dam.

Accuracy.- Excellent.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	64.4	588	1,150	2,330	7,390	5,060	6,140	3,760	2,950	1,690	463	76
2	64.4	771	1,150	2,290	7,440	5,030	6,160	3,730	2,980	1,160	478	16
3	64.4	1,270	1,200	2,310	7,430	5,090	5,280	3,700	3,030	1,130	495	19.6
4	66.1	1,580	1,220	2,390	7,330	5,450	4,370	3,670	3,180	1,100	345	19.6
5	67.8	1,480	1,230	2,410	7,320	5,700	4,370	3,430	3,280	1,100	215	19.5
6	69.5	1,480	1,250	2,450	7,360	6,260	4,350	2,770	3,200	1,100	143	19.4
7	69.5	1,600	1,250	2,470	7,380	6,060	4,270	2,740	3,170	1,100	87.1	19.6
8	74.6	1,890	1,250	2,400	7,380	6,090	4,240	2,700	3,220	1,100	13.9	19.9
9	69.5	1,380	1,250	2,250	7,390	6,140	4,180	2,690	3,190	1,000	13.9	287
10	69.5	1,280	1,250	2,260	7,410	6,100	3,360	2,710	3,270	954	13.5	640
11	74.6	1,290	1,250	2,360	7,440	6,070	2,150	2,720	3,300	949	13.7	497
12	72.9	1,240	1,250	2,360	7,590	6,080	3,190	2,720	3,330	944	13.7	497
13	82	1,180	1,250	2,510	7,610	6,070	3,070	2,700	3,210	939	13.7	798
14	74.6	1,180	1,250	2,870	7,620	6,070	2,900	2,770	3,120	934	12.5	970
15	74.6	1,180	1,250	2,970	7,610	6,080	2,870	2,820	3,210	813	13.1	970
16	72.9	1,180	1,250	2,970	7,610	6,070	2,960	2,760	3,180	339	13.3	970
17	69.5	1,180	1,250	3,040	7,610	6,080	3,180	2,740	3,250	20.4	13	721
18	64.4	1,180	1,260	3,100	7,610	6,090	3,560	2,710	2,760	13	13.2	400
19	66.1	899	1,260	3,100	7,630	6,090	3,560	2,730	2,230	8.9	468	276
20	66.1	859	1,260	3,180	7,650	6,090	3,550	2,690	3,150	7.7	731	151
21	64.4	859	1,330	3,450	6,580	6,080	3,570	2,380	3,040	8	543	87.9
22	67.8	859	1,430	3,470	5,230	6,060	3,690	2,110	3,190	8.6	543	27.3
23	72.9	899	1,440	3,950	4,890	6,080	3,710	3,070	3,240	8.9	543	25.6
24	78	859	1,660	4,730	5,110	6,110	3,790	2,960	3,290	9.2	543	25.9
25	84	868	1,910	5,170	5,220	6,090	3,770	2,870	2,970	10.4	543	30.4
26	90	1,070	1,880	5,820	5,270	6,050	3,780	2,910	2,710	15.6	364	35
27	102	1,170	1,830	6,980	5,320	6,030	3,780	2,870	2,710	18	241	36.5
28	113	1,170	1,990	7,000	5,260	6,000	3,790	2,880	2,710	20.8	167	38.6
29	115		2,160	7,190	5,080	5,990	3,780	2,980	2,710	340	113	40.4
30	121		2,160	7,270	5,080	6,100	3,410	2,920	2,700	542	112	41.2
31	124		2,200		5,070		2,940	2,880		437		293

Month	Total discharge in acre-feet	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	4,820	2,429.5	124	64.4	78.4	4,820
February	64,270	32,401	1,890	588	1,157	64,270
March	88,818	44,720	2,200	1,150	1,443	88,700
April	212,479	107,050	7,270	2,250	3,568	212,330
May	412,634	207,920	7,650	4,890	6,707	412,400
June	353,997	178,360	6,260	5,030	5,945	353,770
July	233,889	117,820	6,160	2,150	3,801	233,690
August	178,800	90,090	3,760	2,110	2,906	178,690
September	181,469	91,480	3,330	2,230	3,049	181,450
October	35,390	17,820.5	1,690	7.7	575	35,350
November	14,498	7,284.6	731	12.5	243	14,450
December	16,023	8,068.4	970	16	260	16,000
Year	1,797,067	905,444	7,650	7.7	2,481	1,795,900

Total discharge in acre-feet is Rio Grande plus Bonita Ditch.

RIO GRANDE COMPACT COMMISSION

RIO GRANDE PROJECT DAILY IRRIGATION REQUIREMENT

This data furnished by U. S. Bureau of Reclamation.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	559	675	2,330	1,760	2,000	2,270	2,490	1,150	1,075	463	0
2	0	745	675	2,290	1,760	2,070	2,270	2,490	1,140	810	478	0
3	0	745	675	2,310	1,760	2,150	2,250	2,490	1,140	565	495	0
4	0	745	675	2,390	1,760	2,150	2,310	2,550	1,360	565	345	0
5	0	745	675	2,410	1,790	2,120	2,310	2,610	1,550	565	215	0
6	0	612	691	2,450	1,815	2,065	2,310	2,610	1,550	565	143	0
7	0	500	705	2,470	1,815	2,065	2,300	2,530	1,750	584	87.1	0
8	0	500	705	2,400	1,770	2,065	2,280	2,470	1,910	600	0	0
9	0	500	705	2,250	1,690	2,030	2,280	2,470	1,910	589	0	287
10	0	500	789	2,260	1,690	1,975	2,310	2,470	1,910	580	0	640
11	0	500	850	2,360	1,690	1,975	2,330	2,330	1,890	580	0	497
12	0	500	850	2,360	1,690	2,050	2,330	2,220	1,790	580	0	497
13	0	500	885	2,360	1,690	2,110	2,330	2,220	1,790	580	0	798
14	0	500	970	2,240	1,690	2,110	2,420	2,200	1,790	580	0	970
15	0	500	970	2,240	1,690	2,110	2,500	2,190	1,550	580	0	970
16	0	500	970	2,240	1,690	2,190	2,500	2,190	1,350	339	0	970
17	0	500	1,010	2,060	1,690	2,360	2,460	2,190	1,350	20.4	0	721
18	0	500	1,040	1,970	1,690	2,370	2,460	2,010	1,300	13	0	400
19	0	500	1,040	1,970	1,690	2,420	2,460	1,860	1,260	8.9	468	276
20	0	580	1,210	1,970	1,690	2,460	2,460	1,860	1,260	7.7	731	151
21	0	775	1,330	1,900	1,690	2,460	2,340	1,890	1,260	8	543	87.9
22	0	775	1,430	1,830	1,750	2,460	2,270	1,910	1,090	8.6	543	0
23	0	775	1,440	1,830	1,800	2,520	2,270	1,910	950	8.9	543	0
24	0	775	1,660	1,760	1,800	2,570	2,330	1,910	950	9.2	543	0
25	0	775	1,910	1,630	1,800	2,570	2,390	1,190	897	10.4	543	0
26	0	775	1,880	1,630	1,860	2,550	2,390	740	853	15.6	364	0
27	0	721	1,830	1,630	2,000	2,510	2,390	740	853	18	241	0
28	0	675	1,990	1,700	2,000	2,510	2,410	970	853	20.8	167	0
29	0		2,160	1,750	2,000	2,510	2,430	1,170	905	340	113	0
30	0		2,160	1,750	2,000	2,380	2,430	1,170	950	542	112	0
31	0		2,200		2,000		2,470	1,170		437		293

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January					34,270
February					72,900
March					124,440
April					109,510
May					134,650
June					145,310
July					121,430
August					79,860
September					22,220
October					14,150
November					14,990
December					
Year					873,730

RIO GRANDE COMPACT COMMISSION

CONEJOS RIVER NEAR MOGOTE, COLORADO

Location.- In Sec. 34, T. 33 N., R. 7 E., at Broyles Bridge, 5½ miles west of Mogote.
Records available.- September 1, 1899 to March 31, 1900, and April 17, 1903 to October 31, 1905, at a point 1 mile below present station. March 21, 1907 to October 5, 1911, 3 miles above present station; January 1, 1912 to December 31, 1942, at present station.
Gage.- Stevens type A-30 recorder in standard shelter (timber) located on right bank 20 feet below bridge. It was constructed in March 1934, replacing old shelter. Shelter is equipped with pitcher pump and reservoir flushing device, and street key extending through recorder shelf. Elevation of intake is 0.5 foot. Reference point is slot in screw set in edge of recorder shelf. Elevation 10.15 feet above zero of gage. Outside gage is vertical staff on downstream side of right bridge abutment.
Bench Marks.- No. 1 is spike in root of large cottonwood tree 40 feet downstream on opposite side of road from shelter. Elevation 7.93 feet above zero of gage. No. 2 is bronze tablet set in concrete located inside fence 60 feet downstream from shelter. Elevation 7.50 feet above zero of gage.
Control.- Located 100 feet downstream at gravel bar which is practically permanent; same for all stages.
Discharge measurements.- (a) Made from cable of 150 feet span located 85 feet downstream from shelter; low water measurements by wading near control. (b) Initial point for soundings right bank of river. (c) Bed composed of coarse gravel and silt which may shift during high water. (d) One channel at all stages, flow fairly smooth and well distributed in cross-section; velocity ranges from 0.5 foot per second at low water to 6-7 feet per second at extreme flood stages. Channel straight for several hundred feet above and below station. (e) Banks lined with scattered brush, and subject to overflow during extreme flood stages. (f) Conditions favorable for accurate measurements.
Floods.- See official records of State Engineer's office.
Zero Flow.- Not determined.
Winter Flow.- Ice forms almost complete cover.
Regulation.- None except that formed by small lakes on headwaters.
Diversions.- Practically no diversions above station.
Accuracy.- With gage heights from recorder, favorable measuring conditions, and practically permanent control, records are excellent.
Cooperation.- Station maintained by the State Engineer in cooperation with the U.S.G.S.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37	33	38	104	350	1,990	740	214	77	49	58	37
2	40	34	39	137	401	2,050	800	211	81	49	61	39
3	42	35	40	174	378	2,120	730	252	70	50	64	52
4	46	36	41	191	453	2,080	615	252	72	49	61	46
5	48	37	38	244	592	1,980	578	186	74	49	53	39
6	50	34	37	248	692	2,080	592	174	74	49	59	34
7	58	36	30	197	840	2,290	555	163	74	49	59	34
8	58	38	31	163	977	2,080	570	154	69	48	57	36
9	52	39	40	181	1,170	2,120	578	145	61	45	59	36
10	48	38	48	208	1,400	2,010	533	137	57	46	53	36
11	48	36	60	313	1,520	2,200	498	137	100	46	51	36
12	50	36	72	361	1,460	2,240	477	129	167	48	50	35
13	50	35	78	366	1,080	2,090	441	123	131	55	49	36
14	49	34	78	512	933	2,010	424	120	102	63	52	37
15	46	31	74	658	944	1,590	418	109	88	61	54	37
16	42	27	72	658	911	1,760	401	107	78	65	55	36
17	40	24	69	674	944	1,840	453	111	72	66	43	35
18	39	24	69	555	999	1,990	435	104	65	68	55	35
19	37	25	84	418	1,090	1,920	401	102	61	61	55	36
20	37	27	65	366	1,280	1,760	334	102	59	57	55	31
21	34	28	65	412	1,540	1,620	302	96	58	57	39	36
22	31	30	70	666	1,780	1,450	277	92	57	57	37	33
23	29	32	78	810	1,890	1,320	252	88	55	55	49	34
24	28	34	85	592	1,840	1,260	252	86	53	54	57	38
25	29	36	91	464	2,090	1,060	240	85	52	53	55	37
26	31	38	79	424	2,160	933	236	81	52	52	43	35
27	32	39	75	389	2,370	880	232	75	51	51	42	30
28	33	41	74	384	2,060	780	220	72	50	51	51	38
29	33		75	389	2,160	692	281	68	49	55	40	44
30	32		81	355	2,030	666	220	66	49	52	38	44
31	32		91		1,910		197	64		53		44

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	1,261	58	28	40.7	2,500
February	937	41	24	33.5	1,860
March	1,967	91	30	63.5	3,900
April	11,613	810	104	387	23,030
May	40,244	2,370	350	1,298	79,820
June	50,861	2,290	666	1,695	100,900
July	13,282	800	197	428	26,340
August	3,905	252	64	126	7,750
September	2,158	167	49	71.9	4,280
October	1,663	68	45	53.6	3,300
November	1,554	64	37	51.8	3,080
December	1,156	52	30	37.3	2,290
Year	130,601	2,370	28	358	259,050

CO148

RIO GRANDE COMPACT COMMISSION

CONEJOS RIVER NEAR LAS SAUSES, COLORADO

This stream enters the Rio Grande through 2 channels, a half mile apart; a gage is maintained on each channel making virtually 2 stations, although only the combined records are published.

NORTH CHANNEL: Location.- In Sec. 2, T. 35 N., R. 11 E., 100 feet below highway bridge ½ mile above mouth. Records available.- March 29, 1921, to December 31, 1942. Gage.- Stevens Type E recorder in standard timber shelter on left bank. Charts set by weight and tape referred to slot in screw in recorder shelf. Elev. 12.03 ft. above zero of gage (7,495.02 ft. above sea level). Chain gage near shelter. Control.- Located 25 ft. downstream at gravel bar, which will shift during infrequent high water. Same control at all stages. Discharge measurements.- (a) Made from 100 ft. span cable or by wading. (b) Bed composed of fine gravel and sand well compacted. (c) One channel at all stages, flow smooth with small velocity and well distributed in cross-section. (d) Channel straight 100 ft. upstream and 400 ft. downstream. (e) Banks covered with brush, may overflow slightly, but grade of highway prevents overflow around station at stages less than 6.5 ft. (f) Conditions favorable for accurate measurements.

SOUTH CHANNEL: Location.- In Sec. 11, T. 35 N., R. 11 E., 2 miles north of Las Sauses and ½ mile above mouth, and 130 ft. below highway bridge. Established.- March 29, 1921 by State Engineer's office. Control.- No well defined control. Gage.- Stevens Type E recorder installed November 1, 1936, in small timber shelter on right bank near road, replacing former shelter 30 ft. upstream. Charts set by weight and tape used from reference point, slot in screw in edge of recorder shelf. Elev. 7.08 ft. above zero of gage (7495.89 ft. above sea level). Outside gage is chain on bridge railing. Discharge measurements.- (a) Made from highway bridge, downstream side in high water. Low water measurements by wading 100 ft. above station. (b) Bed composed of sand and gravel which shifts during high water. (c) One channel at all stages, flow smooth with low velocity. (d) Channel straight for 300 ft. upstream and 100 ft. downstream. (e) Banks covered with brush and subject to overflow, but bridge prevents overflow around bridge at stages of less than 5 ft. (f) Conditions favorable for accurate measurements.

Floods.- See official records of State Engineer's office. Zero Flow.- Not determined. Winter Flow.- Ice forms partial cover at times as most of flow is return water. Regulation.- Storage and irrigation diversions above station. Diversions.- Practically entire flow above station diverted for irrigation. Flow at station consists mainly of return flow. Accuracy.- With gage heights from recorders, and favorable measuring conditions and frequent measurements to define control, records are excellent. Cooperation.- Stations maintained by State Engineer in cooperation with U.S.G.S.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	92	57	55	97	669	1,190	67	3.6	19	30	29	45
2	109	56	57	101	618	1,100	72	3.4	20	31	29	46
3	128	58	60	112	593	1,070	68	3.8	20	31	29	46
4	158	58	63	166	575	1,310	66	3.4	22	31	29	45
5	175	62	52	240	726	1,360	60	3.4	21	30	29	45
6	201	56	65	304	903	1,200	60	3.4	22	30	29	45
7	218	61	57	322	1,060	1,240	54	3.6	23	30	28	44
8	206	64	55	286	1,320	1,400	52	3.6	23	29	28	48
9	117	64	64	224	1,580	1,310	51	3.8	23	28	28	47
10	65	56	81	229	1,780	1,300	49	3.8	23	29	28	47
11	77	52	86	299	2,080	1,240	41	4.6	25	28	29	47
12	73	52	92	427	2,270	1,270	31	4.8	25	28	29	47
13	73	52	108	525	2,140	1,260	27	5.9	25	29	32	47
14	76	48	113	605	1,430	1,210	23	7.5	26	28	35	50
15	77	44	107	891	1,120	1,180	21	12	26	28	35	52
16	71	41	97	1,030	1,000	986	16	12	26	28	33	51
17	62	37	102	1,140	923	896	15	12	24	28	33	51
18	59	35	105	1,240	898	850	14	12	25	28	34	51
19	56	35	105	1,010	934	838	11	13	25	29	33	51
20	54	40	103	755	1,050	773	8.6	13	25	29	33	51
21	51	46	104	643	1,240	695	7.0	12	25	30	32	51
22	47	50	92	826	1,490	613	5.5	11	27	31	31	52
23	39	51	102	1,500	1,720	525	5.5	11	28	31	31	51
24	40	51	114	1,810	1,860	444	5.5	11	28	30	31	51
25	44	53	123	1,320	1,840	351	5.5	12	29	30	31	52
26	46	56	120	935	1,940	265	5.1	11	29	30	31	53
27	47	56	101	808	1,900	224	5.1	12	30	28	36	51
28	56	63	103	746	2,030	200	5.3	13	30	28	44	53
29	59		100	722	1,660	172	4.6	13	30	28	43	50
30	59		97	746	1,540	82	4.3	15	30	28	43	49
31	56		97		1,330		3.7	15		28		48

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	2,691	229	39	86.8	5,340
February	1,454	64	35	51.9	2,870
March	2,780	123	52	89.7	5,510
April	20,059	1,810	97	669	39,790
May	42,219	2,270	575	1,362	83,740
June	26,554	1,400	82	885	52,670
July	863.7	72	3.7	27.9	1,710
August	268.6	15	3.4	8.66	533
September	754	30	19	25.1	1,500
October	904	31	28	29.2	1,790
November	965	44	28	32.2	1,910
December	1,517	53	44	48.9	3,010
Year	101,029.3	2,270	3.4	277.5	200,373

RIO GRANDE COMPACT COMMISSION

SAN ANTONIO RIVER AT ORTIZ, COLORADO

Location.- In Sec. 19, T. 32 N., R. 9 E., half a mile south of Ortiz, and a half a mile above mouth of Los Pinos Creek.
Records available.- January 1 to October 31, 1915; May 1, 1919 to October 31, 1920; October 1, 1924 to December 31, 1942.
Gage.- Stevens Type E recorder in small timber shelter on right bank, installed May 2, 1936, at same location and datum as recorder used previously. Shelter is equipped with funnel flushing device. Charts are set by adjustable reference point in edge of recorder shelf; elevation 7.11 feet above zero of gage. Vertical staff fastened to downstream side of right bridge abutment.
Bench Marks.- No. 2 is point of 3 sided rock, 3' in front of shelter, elevation 4.44 feet above zero of gage.
Control.- Located 50 feet downstream at bar composed of gravel and silt, which will shift during high water.
Discharge measurements.- (a) Made from cable of 100 feet span located a short distance above shelter; low water measurements by wading. (b) Bed composed of gravel and silt which shifts during high water. (c) One main channel at all stages; flow smooth and well distributed in cross-section; velocity moderate. (d) Channel straight for 200 feet above and below station. (e) Banks clean and subject to very limited overflow as station is in canyon. (f) Conditions favorable for accurate measurements.
Floods.- See official records of State Engineer's office.
Zero flow.- Variable.
Winter flow.- Ice forms complete cover.
Regulation and Diversions.- None above station.
Accuracy.- With sufficient measurements to define shifts in control, records considered good.
Cooperation. Station maintained by State Engineer's office in cooperation with U.S.G.S.

* Not a Compact consideration.
Not included in totals for the year.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.*	Dec.
1				56	145	69	2.6	0	0	0.5	5.1	
2				62	154	58	4.2	0	4.7	0.5	3.4	
3				68	134	52	6.3	0	5.5	0.5	3.8	
4				76	174	98	9.2	5.4	3.4	0.5	3.4	
5				88	243	58	5.1	8.6	2.2	0.5	3.0	
6				82	254	49	3.0	4.2	2.6	0.5	2.0	
7				74	320	43	2.6	1.7	1.9	0.6	1.7	
8				82	370	38	1.9	1.2	1.2	0.6	1.9	
9				102	392	32	1.6	1.1	1.4	0.6	1.9	
10				150	141	27	1.6	1.1	1.1	0.8	2.0	
11				270	424	24	1.4	1.2	1.2	0.8	2.0	
12				273	405	22	.9	1.7	14	0.9	2.0	
13				275	273	19	.6	1.9	6.9	1.2	2.3	
14				364	220	19	.4	1.4	4.2	1.7	2.7	
15				376	238	17	.4	1.6	2.2	3.8	2.7	
16				351	218	13	.2	1.7	1.7	4.2	2.7	
17				370	220	12	.3	1.5	1.2	4.7	2.9	
18				281	228	11	.2	1.3	.6	8.0	3.0	
19				178	243	9.7	.4	1.1	.4	9.2	3.0	
20				137	248	8.6	.4	.9	.4	6.9	3.0	
21				205	270	9.2	.3	.7	.3	5.9	3.2	
22				345	273	7.4	.2	.5	.2	4.7	3.4	
23				472	254	5.5	.2	.3	.3	4.2	3.6	
24				254	218	5.5	0	0	.3	3.4	3.9	
25				190	220	4.2	0	0	.4	2.6	3.9	
26				174	198	3.4	0	0	.4	2.6	3.7	
27				181	181	2.6	0	0	.4	2.6	3.4	
28				183	141	2.2	0	0	.4	2.6	3.2	
29				193	124	2.2	0	0	.4	3.0	3.3	
30				183	102	2.0	0	0	.5	3.4	3.2	
31					88		0	0		5.9		

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January					
February					
March					
April	6,095	472	56	203	12,090
May	7,413	441	88	239	14,700
June	723.5	98	20	24.1	1,440
July	44.0	9.2	0	1.42	87
August	39.1	8.6	0	1.26	78
September	60.4	14	0	2.01	120
October	87.9	9.2	0.5	2.84	174
November	* 89.3	* 5.1	* 1.7	* 2.98	* 177
December					
Year	14,462.9	472	0	68.5	28,689

RIO GRANDE COMPACT COMMISSION

LOS PINOS RIVER NEAR ORTIZ, COLORADO

Location.- In Sec. 34, T. 32 N., R. 8 E., 2 miles southwest of Ortiz.
Records available.- January 1, 1914 to November 30, 1920; October 1, 1924 to December 31, 1942.
Gage.- Stevens Type E installed March 25, 1937 in small timber shelter on left bank near road. Shelter has overall height of 14 feet and is equipped with funnel flushing device. It is located at site of pressure gage used previously. Charts set by weight and tape used with reference point, which is slot in screw in edge of recorder shelf. Elevation 9.15 feet above zero of gage. Outside gage has inclined staff graduated to tenths.
Bench Marks.- No. 1 is standard bronze tablet set in concrete located 5 feet upstream from shelter and nearly in line with front of it. Elevation 7.48 feet above zero of gage.
Control.- Located 200 feet downstream at gravel bar, which will shift during high water. Same control at all stages.
Discharge measurements.- (a) Made from cable located just above control, low water measurements by wading near recorder. (b) Bed composed of coarse gravel overlaid by silt. (c) One channel at all stages, flow smooth and well distributed, velocity ranges from 0.5 foot per second at low stages to 6 feet per second at high stages. (d) Channel curves slightly above station and is straight for 300 feet downstream. (e) Banks lined with brush and not subject to overflow. (f) Conditions favorable for accurate measurements.
Floods.- See official records of State Engineer's office.
Zero flow.- Not determined.
Winter flow.- Ice forms complete cover.
Regulations.- None.
Diversions.- Water diverted for irrigation above station.
Accuracy.- With sufficient measurements to determine changes in control, records are good.
Cooperation.- Station maintained by State Engineer's office in cooperation with U.S.G.S.

* Not a Compact consideration
Not included in totals for the year.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	* Nov.	Dec.
1				70	303	735	147	31	22	11	16	
2				79	317	698	158	31	28	10	21	
3				94	310	822	145	30	17	13	25	
4				110	397	893	114	30	17	13	21	
5				124	524	698	102	30	17	15	16	
6				124	617	652	87	30	15	15	18	
7				94	822	657	79	28	16	14	19	
8				79	1,000	594	77	26	15	13	18	
9				92	1,170	572	79	26	15	13	17	
10				110	1,310	550	70	25	13	13	16	
11				210	1,370	558	58	25	60	13	16	
12				228	1,240	545	53	24	60	13	15	
13				260	800	511	43	22	45	14	14	
14				397	672	482	40	22	25	19	14	
15				490	682	420	38	22	19	17	14	
16				585	637	408	37	21	16	17	15	
17				613	682	400	34	21	14	20	14	
18				473	773	385	43	21	13	21	13	
19				345	905	366	34	21	15	19	14	
20				300	1,120	331	34	20	15	16	14	
21				374	1,310	303	34	20	14	16	14	
22				693	1,340	266	32	20	14	16	18	
23				845	1,200	247	32	19	13	15	20	
24				554	1,180	225	32	19	13	15	23	
25				412	1,220	196	32	18	12	16	21	
26				359	1,240	171	31	16	12	16	21	
27				341	1,110	158	31	15	12	16	19	
28				345	955	142	31	13	12	16	17	
29				356	943	127	31	12	11	17	19	
30				334	822	119	31	13	11	13	18	
31					767		31	13		17		

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January					
February					
March	9,490	845	70	316	18,820
April	27,738	1,370	303	895	55,020
May	13,231	893	119	441	26,240
June	1,820	158	31	58.7	3,610
July	684	31	12	22.1	1,360
August	581	60	11	19.4	1,150
September	472	21	10	15.2	936
October	* 520	* 25	* 13	* 17.3	* 1,030
November					
December					
Year	54,016	1,370	10	256	107,136

RIO GRANDE COMPACT COMMISSION

RIO CHAMA NEAR TIERRA AMARILLA, N. MEX.

Location.- Water-stage recorder, Lat. 36°34', N., Long. 106°43', W., in NW¼ sec. 15, T. 27 N., R. 2 E., (projected survey), 1.5 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla.

Records available.- October 1935 to September 1942; October 1913 to November 1916, unregulated records at site 1.5 miles upstream and to independent datum, published as Rio Chama near El Vado and near Tierra Amarilla, all in reports of Geological Survey. October 1913 to September 1916, February 1920 to December 1924 in reports of the State engineer. January 1941 to December 1942 in reports of the Rio Grande Compact Commission.

Extremes.- Maximum discharge during year, 3,880 second-feet Apr. 25 (gage height, 5.96 feet); minimum daily, 20 second-feet April 13.
1935-42 (regulated): Maximum discharge, 6,010 second-feet May 17, 1941 (gage height, 6.89 feet); maximum gage height, 9.63 feet May 30, 1937, former site and datum; minimum daily discharge, 1.2 second-feet Dec. 3, 1939

Remarks.- Records good. Flow regulated by storage in El Vado Reservoir (capacity 200,342 acre-feet at gage height of 6,902.0 feet which is top of spillway gate). Diversions for irrigation above station.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	90	84	84	1,050	1,590	2,800	623	938	930	557	14	11
2	87	84	84	1,050	2,410	2,800	610	908	922	557	14	11
3	87	84	87	1,050	2,290	2,670	598	945	804	557	14	11
4	87	84	87	1,050	2,110	2,540	592	968	692	551	14	11
5	87	84	87	1,060	2,000	2,540	574	968	692	551	13	9.3
6	87	84	84	1,140	2,000	2,480	740	968	686	511	14	10
7	87	84	84	1,270	2,000	2,110	975	960	686	425	14	10
8	87	84	84	1,260	2,170	1,830	952	960	686	420	14	9.3
9	87	82	87	1,270	2,350	1,680	1,010	952	686	415	13	9.3
10	87	82	92	1,270	2,480	1,620	1,150	794	673	410	12	9.3
11	87	82	132	1,190	2,670	1,430	1,220	673	577	410	12	9.3
12	90	82	508	291	2,800	1,190	1,190	673	451	400	13	8.4
13	90	84	968	20	2,860	886	1,150	660	451	400	13	8.4
14	90	84	1,090	470	2,430	886	1,110	660	446	317	12	9.3
15	90	84	1,090	1,010	968	900	1,080	654	446	265	12	9.3
16	90	84	1,080	1,050	1,400	908	1,120	654	446	261	12	9.3
17	90	84	1,070	1,280	2,130	908	730	654	441	257	12	10
18	90	82	1,060	1,680	2,410	915	689	641	628	253	12	10
19	90	84	1,060	1,880	2,740	922	960	641	732	169	12	10
20	87	84	1,060	1,880	3,420	922	975	641	725	115	12	10
21	87	84	1,060	1,880	3,420	930	998	647	725	110	12	10
22	87	84	1,060	2,000	3,060	876	1,070	810	718	110	12	10
23	87	84	1,060	2,540	2,930	610	1,140	908	718	107	12	10
24	87	84	1,050	1,770	3,070	617	1,110	641	712	107	12	10
25	87	84	1,050	2,380	2,760	629	1,010	500	712	107	12	11
26	87	84	1,060	3,720	2,480	561	893	664	705	107	12	11
27	87	84	1,050	3,420	2,600	329	930	738	705	104	12	11
28	87	84	1,060	3,000	2,670	311	960	864	617	104	12	11
29	87		1,050	2,670	2,740	348	960	930	563	104	12	11
30	87		1,050	1,080	2,800	641	982	930	563	64	11	10
31	87		1,050		2,800		990	930		13		10

Month	Second-foot-days	Maximum	Minimum	Mean	Run-off in acre-feet
January	2,724	90	87	87.9	5,400
February	2,342	84	82	83.6	4,650
March	21,578	1,090	84	696	42,800
April	46,681	3,720	20	1,556	92,590
May	76,558	3,420	968	2,470	151,900
June	38,789	2,800	311	1,293	76,940
July	29,091	1,220	574	938	57,700
August	24,474	968	500	789	48,540
September	19,538	930	441	651	38,750
October	8,838	557	13	285	17,530
November	377	14	11	12.6	748
December	310.2	11	8.4	10.0	615
Year	271,300.2	3,720	8.4	743	538,163

RIO GRANDE COMPACT COMMISSION

RESERVOIRS IN COLORADO

SQUAW LAKE RESERVOIR. Dam and adjacent staff gage located in approximate Sec. 12, T. 39 N., R. 4 W., on Squaw Lake. Total capacity of reservoir, 122 acre-feet. Water used for irrigation of lands below Del Norte gaging station.

TROUTVALE NO. 2 RESERVOIR. Dam and adjacent staff gage located in Sec. 10, T. 41 N., R. 3 W., on South Clear Creek. Total capacity of reservoir 435 acre-feet. Water is used for fish culture with occasional sale for irrigation.

FUCHS RESERVOIR. Dam and adjacent staff gage located in Secs. 2 and 11, T. 37 N., R. 4 E., on Pinos Creek. Total capacity of reservoir, 211 acre-feet. Water used for irrigation of lands below Del Norte gaging station.

Date	SQUAW LAKE			TROUTVALE NO. 2			FUCHS		
	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet
Jan 31									
Feb 28									
Mar 31									
Apr 30									
May 31	7.0	122	+ 122	6.6	196	- 55	13.3	153	- 58
Jun 30	7.0	122	0	6.1	168	- 28	13.3	153	0
Jul 31	7.0	122	0	6.1	168	0	13.3	153	0
Aug 31	7.0	122	0	6.1	168	0	9.4	85	- 68
Sep 30	7.0	122	0	6.1	168	0	7.0	51	- 34
Oct 31	7.0	122	0	6.1	168	0	6.5	45	- 6
Nov 30	7.0	122	0	6.1	168	0	6.5	45	0
Dec 31	7.0	122	0	6.1	168	0	6.5	45	0
Year			0			- 28			-108

RESERVOIRS IN NEW MEXICO

CARSON RESERVOIR. Dam and water-stage recorder (staff gage used prior to January 1942) located in S½NW¼ Sec. 12, T. 25 N., R. 10 E., on Aguaje de la Petaca. Total capacity of reservoir 5,684 acre-feet. Water for use on lands in the Carson Reclamation District.

EL VADO RESERVOIR. Dam and water-stage recorder (staff gage used below approximate elevation 6878.0) located in SW¼ Sec. 4, T. 27 N., R. 2 E., on Rio Chama. Total capacity of reservoir 200,340 acre-feet. Water is used for irrigation of lands in Middle Rio Grande Conservancy District.

SAN MATEO RESERVOIR. Dam and water-stage recorder located in SE¼ Sec. 25, T. 13 N., R. 8 W., on Rio San Mateo. Total capacity of reservoir, 57.3 acre-feet. Water used for the irrigation of lands in the vicinity of San Mateo, New Mexico.

Date	CARSON			EL VADO			SAN MATEO		
	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet
Jan 31	0	0	0	6,870.5	113,500	+ 2,000	26.4	23	- 9
Feb 28	7.0	0	0	6,871.0	114,600	+ 1,100	33.2	50	+ 27
Mar 31	6.9	0	0	6,847.6	71,200	-43,400	35.5	62	+ 12
Apr 30	24.6	1,130	+1,130	6,885.7	150,800	+79,600	35.3	61	- 1
May 31	10.2	32	-1,098	6,896.5	182,600	+31,800	34.6	57	- 4
Jun 30	0	0	- 32	6,897.8	186,700	+ 4,100	30.8	39	- 18
Jul 31	0	0	0	6,880.4	136,800	-49,900	27.6	27	- 12
Aug 31	0	0	0	6,858.6	89,810	-46,990	31.2	41	+ 14
Sep 30	0	0	0	6,834.1	51,760	-38,050	28.2	29	- 12
Oct 31	0	0	0	6,821.0	36,170	-15,590	28.2	29	0
Nov 30	0	0	0	6,824.0	39,450	+ 3,280	27.6	27	- 2
Dec 31	0	0	0	6,826.6	42,430	+ 2,980	30.0	36	+ 9
Year			0			-71,070			+ 13

RIO GRANDE COMPACT COMMISSION

RESERVOIRS IN NEW MEXICO

ACOMITA RESERVOIR. Dam and staff gage located in SE¼ Sec. 29, T. 10 N., R. 7 W., filled from Rio San Jose. Total capacity of reservoir, 850 acre-feet. Water used for the irrigation of Indian lands on the Acoma and Laguna reservations.

NEW LAGUNA RESERVOIR. Dam and staff gage located in Sec. 1, T. 9 N., R. 6 W., on the Rio San Jose. Total capacity of reservoir, 683 acre-feet. Water used for the irrigation of lands on the Laguna reservation.

PAGUATE RESERVOIR. Dam and staff gage located in NE¼ Sec. 26, T. 10 N., R. 5 W., on Paguate Creek. Total capacity of reservoir, 976 acre-feet. Water used for irrigation of lands on the Laguna reservation.

Date	ACOMITA			NEW LAGUNA			PAGUATE		
	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet
Jan 31	133.9	734	0	5,862.0	683	0	92.2	931.4	- 45
Feb 28	135.0	795	+ 61	5,862.0	683	0	92.5	976	+ 45
Mar 31	134.6	773	- 22	5,861.8	636	- 47	92.2	931	- 45
Apr 30	134.4	762	- 11	5,859.6	212	- 424	91.4	818	- 113
May 31	131.7	609	- 153	5,856.5	6	- 206	90.6	688	- 130
Jun 30	127.5	404	- 205	5,855.0	0	- 6	89.3	500	- 188
Jul 31	120.5	154	- 250	5,855.0	0	0		0	- 500
Aug 31	115.8	98	- 56		0	0		0	0
Sep 30		0	- 98		0	0		0	0
Oct 31	111.2	37	+ 37	5,860.0	265	+ 265		0	0
Nov 30	123.9	269	+ 232	5,858.5	90	- 175		0	0
Dec 31	132.3	642	+ 373	5,857.7	35	- 55			
Year			- 92			- 648			- 931

ELEPHANT BUTTE RESERVOIR. Dam and gages located in NW¼ Sec. 30, T. 13 S., R. 3 W., on Rio Grande. Total capacity of reservoir, 2,219,000 acre-feet by partial survey and estimate of 1940. Water is used for irrigation and power in New Mexico and Texas.

CABALLO RESERVOIR. Dam and gages located in SW¼ Sec. 19, T. 16 S., R. 4 W., on Rio Grande. Total capacity of reservoir, 345,872 acre-feet including 100,000 acre-feet of flood control storage. Water used for irrigation of lands in New Mexico and Texas.

PROJECT STORAGE. The combined storage in Elephant Butte and Caballo Reservoirs. Total project storage capacity, 2,564,872 acre-feet of which 100,000 acre-feet in Caballo Reservoir is for flood control.

Date	ELEPHANT BUTTE			CABALLO			PROJECT STORAGE		
	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet	GAGE HEIGHT Feet	CONTENTS Acre-feet	CHANGE Acre-feet
Jan 31	4,398.31	1,906,900	- 30,800	4,181.76	343,140	+ 65,850		2,250,040	+ 35,050
Feb 28	4,397.36	1,875,000	- 31,900	4,182.00	345,870	+ 2,730		2,220,870	- 29,170
Mar 31	4,397.66	1,885,000	+ 10,000	4,179.32	315,660	- 30,210		2,200,660	- 28,210
Apr 30	4,404.25	2,116,700	+231,700	4,174.24	263,950	- 51,710		2,380,650	+179,990
May 31	4,407.47	2,235,900	+119,200	4,179.24	314,770	+ 50,820		2,549,870	+169,220
Jun 30	4,407.90	2,252,900	+ 17,000	4,179.41	316,660	+ 1,890		2,569,560	+ 19,690
Jul 31	4,402.54	2,055,300	-197,600	4,176.82	289,020	- 27,640		2,344,320	-225,240
Aug 31	4,400.08	1,968,600	- 86,700	4,171.53	237,680	- 51,340		2,206,280	-138,040
Sep 30	4,399.00	1,930,900	- 37,700	4,158.80	137,240	-100,440		2,068,140	-138,140
Oct 31	4,397.47	1,878,300	- 52,600	4,163.45	171,600	+ 34,360		2,049,900	- 18,240
Nov 30	4,395.48	1,814,200	- 64,100	4,169.03	215,160	+ 43,560		2,029,360	- 20,540
Dec 31	4,394.43	1,780,500	- 33,700	4,174.32	264,740	+ 49,580		2,045,240	+ 15,880
Year			-126,400			- 78,400			-204,800

EVAPORATION AND PRECIPITATION

Records of evaporation at five stations in Colorado and New Mexico are shown on the following pages. Evaporation is shown in inches of water evaporated from a circular land pan 4 feet in diameter and 10 inches deep, set on a wooden platform on top of the ground. Water in the pan is kept at about 7 to 8 inches depth. Measurements are made by a micrometer hook gage.

Precipitation records at the five evaporation stations and the three precipitation stations shown on the following pages have been obtained by daily readings of a standard rain gage 8 inches in diameter.

The evaporation and precipitation stations at Elephant Butte Dam and El Vado Dam, and precipitation stations at Caballo Dam, Pankey Ranch, and San Marcial were in operation prior to the effective date of the Compact. The evaporation and precipitation stations near Wagon Wheel Gap, near Conejos Dam (lower damsite), and at Summitville were installed by the U. S. Weather Bureau at the request of the Compact Commission.

The Rio Grande Compact Commission wishes to acknowledge the cooperation of the United States Weather Bureau in furnishing the records of evaporation and precipitation contained in this report.

RIO GRANDE COMPACT COMMISSION

EVAPORATION AND PRECIPITATION, RIO GRANDE BASIN

COLORADO

WAGON WHEEL GAP (near) - In Mineral County, Colorado, Lat. 37°47' N., Long. 106°49' W., near South Fork, Colorado, Standard land pan, anemometer, maximum and minimum thermometers, and standard 8 in. rain gage.

CONEJOS DAM (near) - In Conejos County, Colorado, Lat. 37°4' N., Long. 106°16' W., near Antonito, Colorado. Standard land pan, anemometer, maximum and minimum thermometers, standard 8 in. rain gage.

PLACE	EVAPORATION													PRECIPITATION											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Wagon Wheel Gap (near)					6.400	9.890	7.834	6.596	6.792	3.776			41.288	0.27	0.78	0.43	4.47	0.23	0.29	1.04	0.77	0.49	1.02	0.25	0.78	10.82
Conejos Dam (near)						10.694	6.832	6.795	7.596	4.338	2.142		38.397						0.25	0.53	0.44	1.49	0.32		0.21	3.24

NEW MEXICO

EL VADO DAM - In Rio Arriba County, New Mexico, Lat. 36°37' N., Long. 106°47' W., at El Vado dam. Standard land pan, anemometer, maximum and minimum thermometers, standard 8 in. rain gage, and recording rain gage.

SAN MARCIAL - In Socorro County, New Mexico, Lat. 33°41' N., Long. 106°58' W., at San Marcial railroad station. Standard 8 in. rain gage and maximum and minimum thermometers.

PANKEY RANCH - In Sierra County, New Mexico, Lat. 33°28' N., Long. 107°15' W., at Pankey ranch. Standard 8 in. rain gage.

ELEPHANT BUTTE DAM - In Sierra County, New Mexico, Lat. 33° N., Long. 107° W., at Elephant Butte Dam, New Mexico. A standard land pan, anemometer, maximum and minimum thermometers and standard 8 in. rain gage.

CABALLO DAM - In Sierra County, New Mexico, Lat. 32°54' N., Long. 107°18' W., at Caballo Dam. Standard 8 in. rain gage, and maximum and minimum thermometers.

El Vado Dam				2.278	9.662	10.594	9.682	8.334	7.311	5.768			53.629	0.22	0.78	1.56	3.54	0.28	0.62	0.80	1.25	0.51	0.81			10.30
San Marcial															0.40	0.05	2.17			0.10	1.74	2.16	1.32			7.94
Pankey Ranch															0.30	0.04	1.47		0.55	1.10	5.10	2.22	0.95			11.73
Elephant Butte Dam	3.179	5.345	8.357	10.593	16.666	16.289	15.559	10.480	8.633	7.062	6.145	3.429	114.737	0.41	0.14		0.36		0.46	0.90	6.11	1.51	0.89		0.58	11.36
Caballo Dam					17.207	18.813	14.726		8.178	6.139	5.266	2.984	73.313	0.38	0.41		0.61		0.10	0.28	3.41	2.00	0.83		0.30	8.35

RIO GRANDE COMPACT COMMISSION

TRANSMOUNTAIN DIVERSIONS

SQUAW PASS

Bristol 8-day recorder and 2-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°36'N., Long. 107°13'W., 24 miles southwest of Creede, Colorado. Diversion intercepts headwaters of Williams Creek, a tributary of Huerto Creek in the San Juan Basin; empties into Squaw Creek, a tributary of the Rio Grande. Flow is diverted from the Rio Grande below the Del Norte gaging station.

TREASURE PASS

Bristol 8-day recorder and 2-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°29'N., Long. 106°48'W., in Sec. 32, T. 38 N., R. 2 E., N. M. P. M. (projected survey), adjacent to U. S. Highway No. 160 on the summit of Wolf Creek Pass, 17 miles southwest of Baxterville, Colorado. Diversion originates on Wolf Creek, a tributary to the San Juan River; empties into Middle Creek, a tributary to South Fork in the Rio Grande Basin. Flow is diverted from the Rio Grande below the Del Norte gaging station.

PIEDRA PASS

Bristol 8-day recorder and 2-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°35'N., Long. 107°00'W., in Sec. 4, T. 38 N., R. 1 W., N. M. P. M. (projected survey), 20 miles south of Creede, Colorado. Diversion originates on the right bank of Piedra River, a tributary to the West Fork of the San Juan River in the San Juan basin; empties into South River, a tributary to the Rio Grande. Flow is diverted from the Rio Grande above the Del Norte gaging station.

Day	SQUAW PASS June	SQUAW PASS July	SQUAW PASS Aug.	SQUAW PASS Sept.	TREASURE PASS June	TREASURE PASS July	TREASURE PASS Aug.	TREASURE PASS Sept.	PIEDRA PASS June	PIEDRA PASS July	PIEDRA PASS Aug.	PIEDRA PASS Sept.
1			1.37								0.82	
2			1.44							1.18	0.82	
3			1.30							1.93	0.82	
4			1.05							4.30	0.82	
5			1.18			1.08				4.50		
6			1.11			1.79				4.20		
7			0.99			1.24				3.72		
8			0.82			0.82				3.72		
9			0.66			0.66				3.72		
10			0.71			1.11				2.73		
11		1.50	0.61			1.57				2.73		
12		2.65	0.61			1.11				2.73		
13		2.32	0.66			0.99				1.79		
14		2.24	0.61			0.93				1.79		
15		2.48	0.47			0.88				1.79		
16		2.57	0.52			0.71				1.79		
17		2.82	0.47			0.99				1.79		
18		2.40	0.35			0.88				1.79		
19		2.01	0			0.71				1.79		
20		1.93								1.79		
21		1.44								1.79		
22		1.72								0.82		
23		1.72								0.82		
24		1.50								0.82		
25		1.44								0.82		
26		1.37								0.82		
27		1.44								0.82		
28		1.44								0.82		
29		1.37								0.82		
30		1.24								0.82		
31		1.24										
				Season				Season				Season
Total		38.84	14.93	53.77		15.47		15.47		60.74	4.10	64.84
Max.		3.00	1.44	3.00		1.79		1.79		4.50	0.82	4.50
Min.		1.24	0.35	0.35		0.71		0.71		0.82	0.82	0.82
Mean		1.89	0.83			1.06		1.06		2.06	0.82	
Ac.Ft.		77.04	29.61	106.65		30.68		30.68		120.47	8.13	128.60

RIO GRANDE COMPACT COMMISSION

TRANSMOUNTAIN DIVERSIONS

FUCHS

Bristol 8-day recorder and 3-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°41' N., Long. 107°19' W., in Sec. 4, T. 39 N., R. 4 W., N. M. P. M. (projected survey), 25 miles southwest of Creede, Colorado. Diversion originates on the North Fork of the Rio de Los Pinos, a tributary to the San Juan River; empties into Weminuche Creek, a tributary of the Rio Grande. Flow is diverted from the Rio Grande above the Del Norte gaging station.

RABER-LOHR

Bristol 8-day recorder and 3-foot wooden Parshall flume. Ditch crosses Continental Divide at Lat. 37°41' N., Long. 107°19' W., in Sec. 4, T. 39 N., R. 4 W., N. M. P. M. (projected survey), 25 miles southwest of Creede, Colorado. Diversion originates on the left bank of Rincon La Vaca Creek, a tributary to the Rio de Los Pinos in the San Juan River basin; empties into Weminuche Creek, a tributary of the Rio Grande. Flow is diverted from the Rio Grande above the Del Norte gaging station.

TABOR

No gage. Ditch crosses Continental Divide at Lat. 37°56' N., Long. 107° 11' W., in Sec. 34, T. 43 N., R. 3 W., N. M. P. M. (projected survey), adjacent to Colorado State Highway No. 149, 14 miles northwest of Creede, Colorado. Diversion originates from right bank of Cebolla Creek, a tributary to the Gunnison River; empties into Deep Creek, a tributary to Clear Creek in the Rio Grande Basin. Flow is diverted from the Rio Grande above the Del Norte gaging station.

Day	FUCHS July	FUCHS Aug.	FUCHS Sept.		RABER-LOHR July	RABER-LOHR Aug.	RABER-LOHR Sept.		TABOR
1		2.64	0.83			8.13	3.08		
2	1.78	2.75	0.76		3.83	9.82	3.08		
3	3.92	2.22	0.76		8.46	6.86	3.32		
4	3.80	2.22	0.41		9.30	6.12	1.54		
5	3.44	2.22			9.82	6.56			
6	3.56	2.12			10.17	5.68			
7	3.56	1.73			10.17	5.39			
8	3.56	1.56			11.07	5.11			
9	3.56	1.55			11.07	5.39			
10	3.32	1.55			11.07	5.39			
11	3.08	1.55			11.07	5.39			
12	2.64	1.55			10.17	5.39			
13	2.53	1.37			9.65	5.39			
14	2.42	1.46			9.65	5.39			
15	2.64	1.20			9.65	6.12			
16	2.64	1.20			9.30	4.57			
17	3.20	1.20			12.00	5.11			
18	2.64	1.20			12.00	4.57			
19	2.02	1.20			11.07	5.11			
20	1.82	1.28			10.00	4.57			
21	1.73	1.04			9.48	3.92			
22	1.64	1.04			8.63	3.92			
23	1.73	1.04			7.49	3.92			
24	1.37	1.55			6.86	4.84			
25	1.28	1.28			6.56	4.31			
26	1.64	1.04			6.56	3.92			
27	1.73	0.90			6.56	3.44			
28	1.92	0.83			7.02	3.08			
29	2.22	0.83			8.13	3.32			
30	1.73	0.83			6.56	3.32			
31	1.73	0.83			7.17	3.08			
				Season				Season	
Total	74.85	44.97	2.76	122.58	270.54	157.13	11.02	438.69	
Max.	3.92	2.75	0.83	3.92	12.00	9.82	3.32	12.00	
Min.	1.28	0.83	0.76	0.76	6.56	3.08	3.08	3.08	
Mean	2.54	1.45	0.79	1.92	9.17	5.07	3.15	6.85	
Ac.Ft.	140.10	89.19	5.47	234.76	536.48	311.59	21.86	869.93	

No measuring device on divide where water enters Rio Grande Basin.

A delivery of 28 acre feet was allowed between June 29 and July 4 by Colorado Special Deputy State Engineer.

There is reason to believe that considerably more than 28 acre feet of water was actually delivered by this transmountain diversion to the Rio Grande basin.

RIO GRANDE COMPACT COMMISSION

RIO GRANDE COMPACT COMMISSION BUDGET FOR FISCAL YEAR 1942-1943

At the Eleventh (Third Annual) Meeting of the Rio Grande Compact Commission held in El Paso, Texas on February 23 and 24, 1942 the following budget for the operation of gaging stations and administration of the Compact was adopted for the fiscal year ending June 30, 1943.

Item	Total Cost	Borne by United States		Borne by Compacting States		
		U. S. G. S.	I. B. C.	Colorado	New Mexico	Texas
GAGING STATIONS:						
In Colorado	$ 3,500.00	$ 1,700.00		$ 1,800.00		
In New Mexico above Elephant Butte	7,100.00	2,900.00	$ 1,200.00		$ 3,000.00	
Below San Marcial	2,500.00					$ 2,500.00
Subtotal	$ 13,100.00	$ 4,600.00	$ 1,200.00	$ 1,800.00	$ 3,000.00	$ 2,500.00
Administration	6,500.00			2,166.00	2,167.00	2,167.00
Total Cost	$ 19,600.00	$ 4,600.00	$ 1,200.00	$ 3,966.00	$ 5,167.00	$ 4,667.00
Net to States	$ 13,800.00			$ 3,966.00	$ 5,167.00	$ 4,667.00
Cash adjustment				Dr.$ 634.00	Cr.$ 567.00	Cr.$ 67.00
Adjusted net to States	$ 13,800.00			$ 4,600.00	$ 4,600.00	$ 4,600.00

At the Thirteenth (Fourth Annual) Meeting of the Rio Grande Compact Commission held in Denver, Colorado on February 24 and 25, 1943 an identical budget for the operation of gaging stations and administration of the Compact was adopted for the fiscal year ending June 30, 1944.

COST OF OPERATION FOR FISCAL YEAR ENDING JUNE 30, 1942

The cost of operation borne by the states for the fiscal year was $12,226.67; a cost to each state of $4,075.55. This latter amount was $524.45 less than the budget. The cost of operation is shown in the following table.

Item	Total Cost	Borne by United States		Borne by Compacting States		
		U. S. G. S.	I. B. C.	Colorado	New Mexico	Texas
GAGING STATION:						
In Colorado	$ 3,500.00	$ 1,700.00		$ 1,800.00		
In New Mexico above Elephant Butte	7,100.00	2,900.00	$ 1,200.00		$ 3,000.00	
Below San Marcial	2,500.00					$ 2,500.00
Subtotal	$ 13,100.00	$ 4,600.00	$ 1,200.00	$ 1,800.00	$ 3,000.00	$ 2,500.00
ADMINISTRATION:						
Secy's salary and Expense	$ 4,748.46			$ 1,582.82	$ 1,582.82	$ 1,582.82
Print 3rd Annual Report	207.24			69.08	69.08	69.08
Blueprint Paper	4.30				4.30	
Deficit in secy's salary	- 33.33			- 33.33		
Subtotal	$ 4,926.67			$ 1,618.57	$ 1,656.20	$ 1,651.90
Total	$ 18,026.67	$ 4,600.00	$ 1,200.00	$ 3,418.57	$ 4,656.20	$ 4,151.90
Borne by States	$ 12,226.67			$ 3,418.57	$ 4,656.20	$ 4,151.90
Share of each	$ 12,226.67			$ 4,075.55	$ 4,075.56	$ 4,075.56
Cash adjustment				Dr.$ 656.98	Cr.$ 580.64	Cr.$ 76.34