

SIXTEENTH ANNUAL REPORT

REPUBLICAN RIVER COMPACT ADMINISTRATION

FOR THE YEAR 1975

TOPEKA, KANSAS JULY 20,1976

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Sixteenth Annual Report

REPUBLICAN RIVER COMPACT ADMINISTRATION

In conformity with the Rules and Regulations of the Republican River Compact Administration, the Sixteenth Annual Report is submitted as follows:

- Pursuant to Rule 12, as amended, this report covers the period from July 30, 1975, to July 20, 1976.
- Members of the Republican River Compact Administration are the officials of each of the states who are charged with the duty of administering the public water supplies, and are as follows:
 - M.E. Ball, Director, Department of Water Resources, Nebraska
 - C.J. Kuiper, State Engineer of Colorado
 - Guy E. Gibson, Chief Engineer, Division of Water Resources, State Board of Agriculture, Kansas
- The Seventeenth Annual Meeting of the Administration was held on July 20, 1976, in the offices of the Division of Water Resources, Kansas State Board of Agriculture, Topeka, Kansas. Minutes of the meeting are included in this report.
- 4. During the period covered by this report, one meeting of the Engineering Committee was held. A report from that Committee together with summary tabulations of the computed annual virgin water supply and the consumptive use for the 1975 water year in the Republican River Basin were presented to and accepted by the Administration at the Seventeenth Annual Meeting. Copies of these presentations are included in this report.
- Rules and Regulations constituting the Republican River Compact Administration, as amended to July 20, 1976, are published as a part of this report.
- On July 20, 1976, M.E. Ball, Nebraska Member of the Administration, was elected Chairman to serve until the next annual meeting of the Administration.

Minutes of the Seventeenth Annual Meeting

Republican River Compact Administration

Topeka, Kansas - July 20, 1976

The meeting was called to order by Guy E. Gibson, Chairman, at 10:15 a.m. in the Conference Room of the State Board of Agriculture, 1720 South Topeka Avenue, Topeka, Kansas.

The following were in attendance:

Name	<u>Agency</u>	Location	
Guy E. Gibson	Official Member	Topeka, Kansas	
M.E. Ball	Official Member	Lincoln, Nebraska	
C.J. Kuiper	Official Member	Denver, Colorado	
Jeris A. Danielson	Division of Water Resources	Denver, Colorado	
R.F. Bishop	Dept. of Water Resources	Lincoln, Nebraska	
Gerald E. Hilmes	Division of Water Resources	Topeka, Kansas	
Emmett Dusharm	Division of Water Resources	Topeka, Kansas	
J.A. Power	Kansas Water Resources Board	Topeka, Kansas	
Denise J. Waters	Division of Water Resources	Topeka, Kansas	

Approval of the Minutes of the previous meeting:

Mr. Kuiper moved that the minutes of the Sixteenth Annual Meeting be confirmed as published in the Fifteenth Annual Report. Mr. Ball seconded. The Chairman declared the motion passed. It was noted that in the printing of the Fifteenth Annual Report that pages 8 and 9 were reversed.

Report of Chairman:

Mr. Gibson reviewed the Water Reservation Right in Kansas.

Mr. Gibson reported that the storage in Norton Reservoir will be depleted approximately by July 24 or 25, 1976, insofar as releases for irrigation purposes are concerned. Alamena Irrigation District below Norton Reservoir released about 5800 acre feet of water and were able to apply about seven inches per acre. He stated he has not received any reports of problems in the Bostwick Irrigation District for the use of water from Harlan County Reservoir and Lovewell Reservoir

Mr. Gibson added to his report that in the 1976 Legislative Session in Kansas a bill was passed which would make it possible for individuals in Kansas, subject to the laws in Kansas pertaining to the appropriation of water, to deliver water outside the state of Kansas to adjacent states that have a reciprocal agreement.

Report of Official Members:

Mr. Kuiper stated that Colorado is having an extremely short water year.

Mr. Ball stated Nebraska is also having a short water year. Shortages are particularly severe in the eastern part of their state and Nebraska started administering water shortly after Memorial Day.

Mr. Ball further reported that a comprehensive groundwater code was passed by their legislature which may in the future require a permit be filed with them for approval to drill wells but will not establish a priority on wells. An earlier law established a division of the state into 24 Natural Resource Districts and provides the Natural Resource District Boards with authority to establish rules and regulations to prevent waste of water. This law also provides for establishing control areas where there is critical drawdown of aquifers. Control areas can limit water supply, pumping and installation of additional wells.

Mr. Ball also stated the Old West Regional Commission authorized \$250,000 to be spent in Nebraska for a recharge study and the two areas picked for study are the Upper Blue and the Upper Republican River. Those studies are now being carried on. The results of those studies will be available to the signatory states of the Republican River Compact. The study will cover a two-year period.

Mr. Ball reported that Ray Aldrich had called him and informed him a group of landowners south of Harlan County Reservoir are considering the use of water from Harlan County Reservoir for irrigation purposes.

Unfinished Business:

Mr. Gibson stated that last year at the annual meeting Mr. Prouty reported that land owners below Bonny Reservoir would probably organize an irrigation district in the near future. Mr. Kuiper suggested that the Bureau of Reclamation be requested to report on that item at the next annual meeting.

Mr. Gibson called attention to Item E of the Sixteenth Annual Meeting. A proposed change in the rules and regulations regarding annual meeting dates was distributed by Mr. Hilmes. After discussion, Mr. Kuiper moved and Mr. Ball seconded that the following rule be adopted:

"A regular annual meeting of the Administration shall be held prior to August 1 each year with the exception that the Chairman may waive an annual meeting upon the unanimous written consent of all official members. Other meetings of the Administration shall be held upon call of the Chairman or upon written request to the Chairman by any official member of the Administration."

Mr. Kuiper moved that the rules and regulations be printed in the Sixteenth Annual Report showing such changes as approved. Mr. Ball seconded. The Chairman declared the motion passed.

New Business:

Mr. Ball stated that the Bureau of Reclamation has asked for a re-study of the Republican River Basin. He stated that the re-study may involve groundwater usage above Enders depleting the inflow into Enders Reservoir.

Mr. Powers stated that U.S. Representative Keith Sebelius contacted Joe Hall and requested the matter of reservoir depletions be looked into. Mr. Hall is considering a total water management study. This fiscal year involves a study in the Solomon and Saline River Basin which lies totally in the state of Kansas. It was Mr. Power's understanding that Norton Reservoir being within the Republican River Basin is the reason Mr. Hall extended this study to include the Republican River Basin. It is also his understanding that the study for the Republican River Basin would be initiated in federal fiscal year 1978. He stated he had met with the Bureau and a number of state agencies about a year ago to touch base and at that time there had been no formulation of planned work and he felt there has been no formulation of planned work at this time but they may have a concept in the near future of what they want to establish.

Mr. Kuiper moved and Mr. Ball seconded the motion that the Chairman write to the regional director of the Bureau of Reclamation to the effect that this has been called to the Administrations attention; that the Compact Administration has certain responsibilities and authority in the basin area; and that the Compact Administration would like to be advised of the study that is proposed in the Republican River basin and to be kept informed. Copies of such letter are to be sent to appropriate senators and representatives. The Chairman declared the motion passed.

Report of other agencies:

Mr. Power distributed copies of Kansas Water News, Volume 18, Numbers 1 and 2, published by the Kansas Water Resources Board with particular reference to page 32, entitled, "Some Observations on the Unusual Hydrologic Conditions in Western Kansas." Mr. Power expressed concern that before the Compact Administration is in a crisis situation that the Administration consider procedures which should be followed in the allocation of the scarce resource of water. He stated that his office would be available to offer assistance in the formulation of such procedure, within the resources and manpower available to them.

There was much discussion concerning guidelines the Compact Administration should adopt that would be initiated during a water short year. Mr. Ball moved and Mr. Kuiper seconded a motion that the members of the Compact Administration prepare a written report and submit such report to members of the Administration 60 days prior to the next annual meeting. Such report shall consist of suggestions and recommendations on administrative procedures that the Compact Administration might review at the next annual meeting and areas that a committed might be assigned to. The Chairman stated the motion passed.

Report of Engineering Committee:

 ${
m Mr.}$ Bishop reviewed the activities of the Engineer Committee and stated assignments were completed.

Mr. Bishop asked if the Administration would accept the Minutes of the Engineering Committee Meeting at this time and if so he would furnish an Engineering Committee Report at a later date. Mr. Kuiper moved that Mr. Bishop do this and that he circulate the report to Administration Members for their signatures as a matter of acceptance. Mr. Ball seconded. The Chairman declared the motion passed.

 ${\rm Mr.}$ Kuiper moved and ${\rm Mr.}$ Ball seconded that the assignments to the Engineering Committee for fiscal year 1977 be as follows:

- 1. Compute annual virgin water supply, 1976 water year;
- 2. Compute annual consumptive use, 1976 water year;
- Compute adjusted allocations on annual, five-year average and ten-year average basis;
- Any other special assignment that might be assigned to this committee by the Compact Administration during the coming year.

Mr. Gibson declared the motion passed.

Election of Chairman:

Mr. Kuiper moved that Mr. Marion Ball be elected Chairman of the Compact Administration for the coming year. Mr. Gibson seconded. The Chairman declared the motion passed.

Adjournment:

Mr. Kuiper moved that the meeting be adjourned. Mr. Ball seconded. The Chairman declared the motion passed, whereupon, the Sixteenth Annual Meeting of the Republican River Compact Administration was adjourned at 12:50 p.m., July 20, 1976.

Respectfully submitted,

by:

Variate Mamban (6

Colorado Member

Nobracka Member

Report of Engineering Committee

Republican River Compact Administration

July 20, 1976

The Republican River Compact Administration at its 16th annual meeting held July 30, 1975, agreed the assignments to the Engineering Committee would be as follows:

- 1. Compute annual virgin water supply, 1975 water year;
- 2. Compute annual consumptive use, 1975 water year;
- Compute adjusted allocations on annual, five-year average and ten-year average basis;
- Any other special assignment that might be assigned to the Committee by the Compact Administration during the coming year.

The Engineering Committee held one regular meeting during the year, June 2-3, 1976, to study the virgin water supply and consumptive use of the water supply for 1975. Submitted here and made a part of this report are the following:

- (Exhibit A) Computed annual virgin water supply Republican River Basin, 1975 water year;
- (Exhibit B) Computed annual consumptive use Republican River Basin, 1975 water year;
- Computed inflow to Lovewell Reservoir and net evaporation of Republican River water stored in Lovewell, 1975 water year;
- Computed adjusted allocations on annual five-year average and ten-year average basis.

It is the recommendation of the Engineering Committee that the computed annual virgin water supply and computed annual consumptive use for the 1975 water year be published in the 16th annual report of the Republican River Compact Administration.

The detailed computations of the virgin water supply and consumptive use, the adjusted allocations on an annual basis for 1975, and a five-year and ten-year average basis are available for inspection by members of the Compact Administration.

The following exhibits are available to the members of the Compact Administration with the recommendation that they not be published in detail in the Sixteenth Annual Report.

- 10A. Computed Annual Virgin Water Supply for the 1975 water year;
- 10B. Adjusted allocations computed on the Basis of Annual Virgin Water Supply, for 1975 water year;
- 10C. Average Annual Virgin Water Supply for Five-year Running Averages for 1971-1975 and Ten-year Running Averages for 1966-1975;
- 10D. Adjusted Allocations by Five-year and Ten-year Running Averages for same years as 10C.
- 10E. Computed Annual Consumptive Use by States for 1975 water year.

The above computations made by the Engineering Committee followed the procedures of previous years.

Municipal and industrial uses are not included in the virgin water supply computations; but, for the record, those available to the Committee are as follows:

City of Norton 883 Ac. Ft.
(Amoco) Midwest Oil Co. 278 Ac. Ft.
(Ladd) L.V.O. Oil Co. 41 Ac. Ft.

Recorded diversions from the North Fork Republican River by the Haigler Canal for 1975 were:

 Colorado
 3,880 Ac. Ft.

 Nebraska
 7,890 Ac. Ft.

 Total
 11,770 Ac. Ft.

Other recorded diversions from surface water in Colorado with the exception of the Hale Ditch were:

S. Fk. Republican River
N. Fk. Republican River
Arikaree River
Beaver Creek
3,410 Ac. Ft.
0 Ac. Ft.
0 Ac. Ft.

Colorado diversions from groundwater were based on an average diversion of 169 acre-feet per well producing from valley alluvium and are shown below in acre-feet:

S. Fk. Republican River 1,350 N. Fk. Republican River 510 Arikaree River 4,900 Beaver Creek 0 Nebraska recorded diversions from surface water by other than major canals are given below in acre-feet:

Frenchman Creek	650	Buffalo Creek	1,170
Medicine Creek	1,170	Beaver Creek	1,410
Red Willow Creek	440	Sappa Creek	2,450
Republican River	20.940	• •	•

In other basins in Nebraska, surface water diversions were computed as 1.8 acre-feet per acre intended to be irrigated. Groundwater diversion rate used for 1975 in Nebraska was 1.6 acre-feet per acre irrigated as determined from reports of irrigators for 10% sample of wells pumping from the valley alluvium.

Diversions by individual irrigators from alluvial wells and streams in Kansas were estimated on the basis of water use reports from 42% of the water users. Average of all reported diversions in the Republican River Basin in Kansas was 1.8 Ac. Ft./Ac. Average rate of diversion from groundwater was 1.8 Ac. Ft./Ac. and from surface water was 1.8 Ac. Ft./Ac.

Estimated diversions by individuals in Kansas for 1975 are given below in acre-feet:

Sub-basin	Groundwater	Surface Water
Arikaree River	420	 0
S. Fk. Republican River	6,840	1,040
Beaver Creek	11,470	460
Sappa Creek	11,210	180
Prairie Dog Creek	13,720	1,060
Republican River above Hardy	140	1,590

Return flow percentages were computed for the major canals from data provided by the U. S. Bureau of Reclamation as follows:

<u>Canal</u>	Return as Per Cent of Total Diversions	<u>Canal T</u>	Return as Per Cent of otal Diversions
Culbertson	42%	Franklin	54%
Culbertson Ext.	50%	Franklin Pump	52%
Meeker-Driftwood	38%	Naponee	43%
Red Willow	40%	Superior	48%
Cambridge	38%	Courtland-Nebr	
Bartley	38%	Courtland-Kans	as
Almena	42%	above Lovewel	1 40%
		below Lovewel	1 39%

Return flow percentages for other canals and diversions were estimated as given below:

Hale Ditch and Haigler Canal	38%
Champion and Riverside Canals	42%
Groundwater and surface water diversions	25%

Computation of return flow from the Courtland Canal in Nebraska is shown below:

Courtland Canal-Stateline Total loss in Nebraska Direct Supply to Nebraska Lands Courtland Canal Transportation Loss in Nebraska Return Flow Percentage	1,100 0,910 0,190 1,560 8,630 75% 6,470 390 6,860

In Kansas 80% of the irrigable land above Lovewell was irrigated in 1975 with an average diversion rate of 2,32 acre-feet per acre. Based on this data it was estimated that 2,110 acre-feet were diverted on 910 acres above Hardy and the return flows were 840 acre-feet.

Diversion of return flows between tributaries and main stem Republican are given below in acre-feet:

Canal Champion Riverside Culbertson Culbertson Ext. Totals	3,480 1,510 19,460 25,020 49,470	Retu % 42 42 42 50	Ac.Ft. 1,460 630 8,170 12,510 22,770	Division of F Frenchmar 1,460 (100%) 630 (100%) 6,780 (83%) 8,870	1,390 (17%) 12,510 (100%)
Meeker-Driftwood	41,640	38 40	15,820 4,010	Driftwood 3,800 (24%) Red Willow 400 (10%)	Main Stem 12,020 (76%) Main Stem 3,610 (90%)

The 1975 annual virgin water supply was computed using the above together with stream-flow, diversion and reservoir records.

Net evaporation from Harlan County Reservoir was divided (57%) 8,450 acre-feet to Kansas and (43%) 6,380 acre-feet to Nebraska based on total diversions by the canals in each state below Harlan County Reservoir.

Division of consumptive use of the Courtland Canal transportation loss thru Nebraska is given below: lack

Courtland Canal	Acre-feet
Transportation Loss Return flow to river of transportation loss Consumptive use-Transportation Loss	8,630 - 6,470 2,160

Kansas Share = Stateline Flow Headgate Diversions = $\frac{70,910}{81,100}$ = 87%

Kansas Share of Loss C.U. = $2,160 \times 87\% = 1,880$ Ac. Ft. Nebraska Share of Loss C.U. = 2,160 - 1880 = 280 Ac. Ft.

Consumptive use in Nebraska by the Courtland Canal was computed from the return flow computation rather than using the virgin water supply data, as follows:

Courtland Canal in Nebraska	Acre-feet
Net supply Return flow (1,560 x 25%) Consumptive use-irrigated lands in Nebraska Consumptive use-transportation loss Total consumptive use in Nebraska	$ \begin{array}{r} 1,560 \\ -390 \\ 1,170 \\ +280 \\ 1,450 \end{array} $

Computations of inflow to lovewell Reservoir show a 1975 total inflow of 73,570 Ac. Ft. of which 42,480 Ac. Ft. was diverted from the Republican River. Computed operations of Lovewell Reservoir for 1975 gave a net evaporation loss of 1,560 Ac. Ft. from Republican River Water. Storage in Lovewell Reservoir at the beginning of the water year was 30,560 Ac. Ft. of which 7,400 Ac. Ft. was water from the Republican River. At the close of the water year, storage in Lovewell was 36,560 Ac. Ft. of which 4,610 Ac. Ft. was water from the Republican River.

Computation of consumptive use in Kansas of water diverted from the main stem Republican River, including prorated shares of net evaporation from Harlan County Reservoir and Courtland Canal transportation loss thru Nebraska was 56,920 acre-feet in the 1975 water year.

Consumptive Use in Nebraska - 1975

	By Formula Ac. Ft.	Above Mouth Ac. Ft.
Prairie Dog Creek	0	800
Beaver Creek	14,920	18,510
Sappa Creek	10,540	10,610
Medicine Creek	10,840	11,550
S. Fk. Republican River	540	² 540
Buffalo Creek	1,100	1,100

This report of the Engineering Committee was not prepared in time for presentation at the annual meeting of the Compact Administration at Topeka, Kansas, on July 20, 1976. Therefore, provision is made at the end of this report for acceptance by signature of the Compact Administration Members.

Respectfully submitted,

Roket G. Dishef 8/6/76
Nebraska Date

Ramsas, B/3//26

Ramsas, Date

Colorado Date

Accepted by:

Kansas Member (Chairman)

\$/31/16 Date

colorado Member)

8-17-76 Date

Nebraska Morkor

Date

Computed Annual Virgin Water Supply Republican River Basin

Drainage Basin	Compact Ac. Ft.	1975 W.Y. Ac. Ft.
Prairie Dog Creek Sappa Creek Beaver Creek Medicine Creek	27,600 21,400 16,500 50,800	30,480 31,690 28,930 49,460
Red Willow Creek Driftwood Creek Frenchman Creek South Fork of the Republican River	21,900 7,300 98,500 57,200	26,960 4,080 124,820 46,010
Rock Creek Buffalo Creek Arikaree River North Fork of the Republican River	11,000 7,890 19,610 44,700	9,550 5,540 11,930 42,910
Main Stem of the Republican plus Blackwood Creek	*94,500	269,090
TOTALS	478,900	681,450
*Main Stem Blackwood Creek	87,700 6,800	

6/8/76

Computed Annual Consumptive Use Republican River Basin

1975 Water Year

	Drainage Basin	Colorado	Kansas	Nebraska	Total
	Prairie Dog Creek	-	16,070	800	16,870
	Sappa Creek	~	8,550	10,540	19,090
	Beaver Creek	0	8,940	18,510	27,450
!	Medicine Creek	-	-	11,550	11,550
	Red Willow	-	-	12,230	12,230
	Driftwood	_	-	630	630
	Frenchman Creek	-	-	63,130	63,130
	South Fork of the Republican River	7,120	5,910	540	13,570
	Rock Creek	-	-	0	0
	Buffalo Creek	-	-	1,100	1,100
į	Arikaree River	3,680	320	0	4,000
	North Fork of the Republican River	5,350	-	4,890	10,240
	Main Stem of the Republican River	-	56,920	188,710	245,630
	TOTALS	16,150	96,710	312,630	425,490

6/8/76

Rules and Regulations

Republican River Compact Administration (As Amended to July 20, 1976)

- The State Engineer of the State of Colorado; the Director of Water Resources of Nebraska; and the Chief Engineer, Division of Water Resources, State Board of Agriculture of the State of Kansas, being officials in their respective states charged with the duty of administering public water supplies, shall be the official members of and together they shall constitute an administrative body hereby designated, "The Republican River Compact Administration".
- The Republican River Compact, hereinafter referred to as the "Compact", shall be administered by the Republican River Compact Administration, hereinafter referred to as the "Administration".
- 3. The terms of office of official members of the Administration shall be concurrent with their respective terms of office as officials of each state charged with the duty of administering the public water supplies.
- 4. Each official member of the Administration shall be recognized in that capacity upon furnishing to the other official members satisfactory evidence that he is the official in his state charged with the duty of administering the public wath supplies.
- 5. If an official member shall be unable to serve personally at any meeting of the Administration, he may appoint a personal representative, other than another official member of the Administration, to serve in his place at said meeting. Such personal representative shall be recognized in that capacity upon furnishing to the official members from the other states or their personal representatives certificate showing that he has been duly appointed by the official member whom he is to represent. All actions taken in the transaction of business of the Administration by any such duly appointed representative shall be made in the name of the official member whom he represents and shall be binding on such official member.

- 6. The Chairman of the Administration shall be an official member of the Administration and shall be elected at the annual meeting for a term of office continuing to the close of the annual meeting the following year. In the absence of the Chairman at any meeting, the official members of the Administration and any duly appointed and acting personal representatives present at that time shall select one of them to serve as temporary Chairman. In the event of a vacancy in the office of the Chairman, his successor as the official member from his state shall be temporary Chairman until the next meeting of the Administration at which time, as the first order of business, the vacancy shall be filled by election of an official member of the Administration who shall thereupon be Chairman for the unexpired term.
- 7. The Chairman shall preside at all meetings of the Administration and may initiate or second motions and vote on all matters coming before the Administration. He shall issue notice of meeting to all official members as to time, place, and purpose in advance of each meeting of the Administration. The Chairman shall keep a record of the proceedings of all meetings and of all transactions of the Administration during his term of office and shall furnish copies thereof concurrently to the other official members to the end that each official member shall have and preserve a complete file of the records of the Administration.
- 8. The Administration may, from time to time, create committees composed of such official members of the Administration and others as it may determine and assign to such committees such tasks as the Administration may designate.
- each year with the exception that the Chairman may waive an annual meeting upon unanimous written consent of all official members. Other meetings of the Administration shall be held upon call of the Chairman or upon written request to the Chairman by any official member of the Administration.

9. A regular annual meeting of the Administration shall be held prior to August 1

10. A quorum for the purpose of transacting official business at any meeting of the Administration shall be at least two official members of the Administration or their duly appointed representatives. In all matters coming before the

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Administration any action shall be determined by vote. Each state shall have one vote and every decision, authorization or other action shall require a unanimous vote of the official members or their duly appointed and acting personal representatives present at a meeting.

11. At each meeting of the Administration, the order of business, except as provide by rule No. 6 herein, shall be as follows:

Reading, correction, and approval of minutes of last meeting

Report of Chairman

Reports of official members or representatives

Unfinished business

New business

Adjournment

- 12. The administration, following each annual meeting, shall adopt and enter upon its records a report covering a summary of its transactions and proceedings for the preceding year, the current status of its affairs and including such other matters as may be deemed appropriate by the official members. Copies of the report may be furnished to the President of the United States; the Governors of the States of Colorado, Nebraska and Kansas; officials of state and federal agencies and other as determined by the Administration.
- 13. Amendments, revisions, deletions or additions to these Rules and Regulations may be made at any meeting of the Administration, provided that official members or duly appointed and acting personal representatives from all three states are present. Such changes may also be made at any meeting at which a quorum is present, provided that a statement of the proposed changes is sent by the Chairman to all official members of the Administration by ordinary mail at least fifteen (15) days in advance of the meeting at which they are to be considered.