

961

# Surface Water Records of Colorado



**UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY**

Prepared in cooperation with the State of Colorado and other agencies

(200)  
Ga2  
Colorado  
1961-63

✓  
U.S. Geological Survey (Water Resources Division) *Surface Water Branch,*

SURFACE WATER RECORDS  
OF COLORADO

1961-1963

Prepared under the direction of J. W. Odell, District Engineer,  
Surface Water Branch, in cooperation with the State of  
Colorado and other agencies

255203

Copies of this report may be obtained from  
District Engineer, Surface Water Branch  
✓ U. S. Geological Survey  
Denver Federal Center  
Denver 25, Colorado



# CALENDAR FOR WATER YEAR 1961

## OCTOBER 1960

S	M	T	W	T	F	S
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## NOVEMBER 1960

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## DECEMBER 1960

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## JANUARY 1961

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## FEBRUARY 1961

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## MARCH 1961

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## APRIL 1961

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## MAY 1961

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## JUNE 1961

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## JULY 1961

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## AUGUST 1961

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## SEPTEMBER 1961

S	M	T	W	T	F	S
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# SURFACE WATER RECORDS OF COLORADO, 1961

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## INTRODUCTION

The surface-water records for the 1961 water year for gaging stations and miscellaneous sites within the State of Colorado are given in this report. For convenience there are also included records for a few pertinent gaging stations in bordering States. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of W. T. Miller, district engineer, Surface Water Branch, succeeded by J. W. Odell.

This report marks the beginning of a new method of presenting, annually, basic data on surface-water records by States. Through September 30, 1960, the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Colorado were contained in Parts 6B, 7, 8, and 9 of that series.

Beginning with the 1961 water year, streamflow records and related data will be released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these basic-data reports will be limited and primarily for local needs. The records later will be published in Geological Survey water-supply papers at 5-year intervals. These 5-year water-supply papers will show daily discharge and will be compiled on the same geographical areas previously used for the annual series; however, some of the 14 parts of conterminous United States will be further subdivided.



## COOPERATION

Cooperative agreements between the U.S. Geological Survey and organizations of the State of Colorado for the systematic collection of streamflow records began in 1895. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

Office of the State Engineer, J. E. Whitten.  
Colorado Water Conservation Board, F. L. Sparks, director.  
Denver Board of Water Commissioners, T. P. Campbell, president.  
City of Colorado Springs, J. A. McCullough, superintendent, Water Division.  
Boulder County, Board of County Commissioners, Joe Smith, chairman.  
Colorado Agricultural Experiment Station, S. G. Wheeler, director.  
Colorado River Water Conservation District, P. P. Smith, secretary-engineer.  
Southeastern Colorado Water Conservancy District, C. H. Boustead, executive secretary.  
Arkansas River Compact Administration, Carl G. Paulsen, chairman, succeeded by F. M. Bell.

Assistance in the form of funds or services was given by the Corps of Engineers, Department of the Army, in collecting records for 12 gaging stations published in this report.

Assistance was also furnished by the Soil Conservation Service and the Bureau of Reclamation of the U.S. Department of the Interior.

The New Mexico district of the U.S. Geological Survey furnished records for five gaging stations published in this report.

## DEFINITION OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

#### DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in the same downstream order used in the water-supply papers. Records are listed in a downstream direction along the main stem with all stations on a tributary entering above a main-stem station listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indentation in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indentation shows which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

As an added means of identification, each gaging station has been assigned a station number. The numbers have been assigned in the same downstream order used in the annual series of water-supply papers. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive.

The complete number for each station, such as 6-7520.00, includes the part number "6" and a six digit station number. In this report, the part number and only the essential digits of the station number are shown. For example, the complete number 6-7520.00 appears as 6-7520, just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

#### EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. The records of stage are obtained either from a water-stage recorder that gives a continuous record of fluctuations or from direct readings on a nonrecording gage. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is in effect the shifting-control method.

At some gaging stations the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for other stations in the same or nearby basins.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute the daily discharge. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins.

The data in this report generally comprise a description of the station, a skeleton rating table, and a table showing the daily, monthly, and yearly discharge of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the 1961 water year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U.S. Coast and Geodetic Survey. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is little or no regulation; the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height if it is significant. In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily



those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record are given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder, a crest-stage indicator, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks."

Skeleton rating tables are published for all stations except those for which the daily discharge for the greater part of the open-water period was determined by the shifting-control method or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables generally are not published for canals or ditches.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such a fluctuation, the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, which is an instrument for obtaining the daily mean discharge from a continuous gage-height graph and containing, as an essential element, a curve representing the stage-discharge relation at the station. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge corresponding to once-daily readings of the gage, or to the mean of twice-daily readings, or to the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Discharge for the month is expressed in acre-feet (line headed "Ac-ft").

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

## EXPLANATION OF DATA

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Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods for which discharge was computed or estimated by unusual or special methods because of no gage-height record, ice effect, or other conditions that reduce the degree of accuracy of the records. The footnotes are either reference footnotes, with corresponding symbols used in the table of daily discharge to indicate the days included, or general footnotes, introduced by the word "Note," in which the days included are stated. The following footnotes and their corresponding symbols have been standardized for use throughout this report. The methods used in computing data for such footnoted periods have been explained in preceding paragraphs.

\* Discharge measurement made on this day. Used to indicate days on which discharge measurements were made at a gaging station unless they were made at frequent regular intervals, two or more times monthly, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

\*\* Field estimate made on this day. Used to indicate days on which an estimate of the flow was made at the gaging station.

a No gage-height record. Used to indicate periods when there was no gage-height record or the available record was such that it could not be used to compute the daily discharge. No mention is made of periods of no gage-height record if they are few and of short duration, no more than 4 days in succession and not more than 12 days distributed throughout the water year, and if the degree of accuracy of records for those days is not changed.

b Stage-discharge relation affected by ice. Used to indicate periods when the stage-discharge relation is affected by ice forming on stream, control, or streambed. No mention is made of occasional days of ice effect if the degree of accuracy of daily records is not changed.

c Backwater from aquatic growth (or debris or other conditions). Used only when records for the periods affected are rated down in accuracy.

e Shifting-control method used. Used only when records for the periods affected are rated down in accuracy.



g Computed from once-daily (twice-daily, etc.) staff (or chain, wire-weight, etc.) gage readings. Used only for recording stations for periods when the water-stage recorder graph was not used but readings of a nonrecording gage were used. The symbol is not used for periods of short duration if the degree of accuracy of records for the periods involved are not changed.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published each year for all reservoirs for which records are published on a daily basis, but it is not published for reservoirs for which only monthly data are given.

#### ACCURACY OF FIELD DATA AND COMPUTED RESULTS

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

The station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For a few such stations, monthly and annual figures are adjusted for diversions or storage above station. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

#### SUPPLEMENTAL DATA

Discharge measurements at miscellaneous sites are given at the end of this report.

Information of a more detailed nature than that published for most of the gaging stations is on file in the district office, such as discharge measurements and recorder charts or nonrecording-gage readings. Some gaging-station records in the State through 1957 have been analyzed with an electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year. At some gaging stations water samples are collected from the streams for the purpose of making chemical analyses; computing dissolved solids, suspended sediment loads, and particle-size distribution; or measuring water temperatures. For most of these samples the results are published in an annual series of U.S. Geological Survey water-supply papers entitled "Quality of Surface Waters of the United States." Information on the availability of electronic computer analyses, unpublished data, or quality of water records may generally be obtained from the district office.

## SURFACE WATER RECORDS OF COLORADO, 1961

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE  
GEOLOGICAL SURVEY

The table below contains a list of gaging stations at which records of discharge were collected during the water year October 1960 to September 1961 by the Colorado Springs Water Department. The records of these stations are not contained in publications of the Geological Survey.

Stream	Location	Period
Bear Creek.....	Near Colorado Springs, Colo.....	1918-61*
Boehmer Creek.....	Near Pikes Peak, Colo.....	1909-61*
Cabin Creek.....	Near Halfway, Colo.....	1906-61*
Crystal Creek.....	Below reservoir near Green Mountain Falls, Colo.	1935-61
Do.....	Near Green Mountain Falls, Colo.	1935-61
French Creek.....	Near Cascade, Colo.....	1935-61
Lion Creek.....	Near Halfway, Colo.....	1908-61*†
Little Beaver Creek..	Near Pikes Peak, Colo.....	1909-61*†
North Cascade Creek..	At Cascade, Colo.....	1935-61
North Catamount Creek	Near Green Mountain Falls, Colo.	1935-61†
Sackett Creek.....	Near Pikes Peak, Colo.....	1909-61*†
Sheep Creek.....	Near Halfway, Colo.....	1908-61*†
South Cascade Creek..	At Cascade, Colo.....	1935-61†
South Catamount Creek	Below reservoir near Green Mountain Falls, Colo.	1935-61
Do.....	Near Green Mountain Falls, Colo.	1935-61
South Ruxton Creek...	At Halfway, Colo.....	1906-61*
Sutherland Creek.....	Near Manitou, Colo.....	1918-61*

\* Records prior to 1931 are contained in water-supply papers published by the Geological Survey.

† Records prior to 1951 published in WSP 1311.

## PLATTE RIVER BASIN

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6-6160. North Fork Michigan River near Gould, Colo.

Location.--Lat 40°33'10", long 106°00'36", in NE<sup>1</sup>/<sub>4</sub>NE<sup>1</sup>/<sub>4</sub> sec.27, T.7 N., R.77 W., on right bank 2 miles northeast of Gould, 3½ miles upstream from mouth, and 19 miles southeast of Walden.

Drainage area.--20.2 sq mi.

Records available.--October 1950 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 8,848 ft above mean sea level, unadjusted.

Average discharge.--11 years, 16.8 cfs (12,160 acre-ft per year).

Extremes.--Maximum discharge during year, 290 cfs May 25 (gage height, 3.15 ft), from rating curve extended above 160 cfs; minimum not determined.

1950-61: Maximum discharge, that of May 25, 1961; maximum gage height, 3.35 ft Apr. 8, 1954 (ice jam); minimum discharge not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One diversion above station for irrigation of hay meadows below.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

0.5	2.6	0.7	4.8	1.8	61
.6	3.6	.8	7.0	2.2	115
.8	7.4	1.0	12	2.7	200
		1.5	34		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	4.7						*21	143	27	14	6.8
2	4.4	5.0						25	135	24	12	7.2
3	4.4	5.0						33	128	24	10	8.5
4	4.4	5.0						31	110	23	9.0	9.2
5	4.4	4.4						22	100	22	8.5	14
6	4.4	4.6			(*)	(*)		20	99	21	8.2	*20
7	4.2	4.9						15	100	22	8.2	23
8	4.2	4.8						11	103	*21	7.8	24
9	4.2	3.8						17	103	19	*7.8	23
10	4.6	4.3					(*)	36	102	18	7.2	19
11	4.7	4.9		(*)			5	89	97	17	7.2	16
12	4.7	4.7						108	93	17	8.0	15
13	4.6	4.7						56	*87	16	8.0	14
14	5.2	5.0						32	81	13	6.8	13
15	5.6	4.7						29	72	17	6.1	12
16	6.5	4.7	3.5	3	3	3.5		27	66	15	6.8	12
17	6.5	4.9						31	62	14	13	12
18	*6.1	4.7						43	59	13	7.0	12
19	5.4	4.7						81	59	12	5.9	16
20	5.2	*4.0						110	66	13	5.5	16
21	5.0	4.3						132	57	26	6.3	18
22	5.0	4.3						143	50	16	5.9	21
23	4.9	4.1						153	48	13	5.0	20
24	4.9	4.0						148	45	12	5.0	18
25	4.7	3.8						181	40	11	7.0	21
26	4.4	3.8					10	177	35	11	8.0	23
27	4.4	3.8						172	33	11	6.1	26
28	4.7	3.6						181	31	12	5.2	35
29	3.9	3.3						192	29	11	5.9	40
30	4.2	4.1						160	23	10	6.6	32
31	4.5							*146		12	7.2	
Total	143.7	132.6	108.5	93	84	103.5	200	2,627	2,262	513	235.2	546.7
Mean	4.80	4.42	3.5	3	3	3.5	6.7	84.7	75.4	16.7	7.59	18.2
Ac-ft	295	263	215	184	167	215	397	5,210	4,490	1,030	467	1,080

Calendar year 1960: Max 144 Min - Mean 20.4 Ac-ft 14,790  
 Water year 1960-61: Max 192 Min - Mean 19.4 Ac-ft 14,010

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-11	6:30p.m.	2.48	160	5-29	8p.m.	3.13	286
5-25	6:30p.m.	3.15	290				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 2, 3, 5-12, 18-27. No gage-height record Nov. 28 to Apr. 30 (stage-discharge relation affected by ice during most of period).



## PLATTE RIVER BASIN

6-6200. North Platte River near Northgate, Colo.

Location.--Lat 40°56'10", long 106°20'21", in SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.11, T.11 N., R.80 W., on right bank 350 ft downstream from bridge on State Highway 125, 0.8 mile upstream from Camp Creek, 4.2 miles northwest of Northgate, and 4.4 miles south of Colorado-Wyoming State line. Prior to Aug. 22, 1961, at site 0.8 mile downstream.

Drainage area.--1,431 sq mi.

Records available.--May to November 1904 (published as "near Pinkhampton"), May 1915 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder. Datum of gage is 7,810.39 ft above mean sea level, adjustment of 1912. May 11 to Nov. 9, 1904, staff gage 0.8 mile downstream at different datum. Apr. 30, 1915, to May 12, 1916, staff gage, May 13, 1916, to Sept. 17, 1917, chain gage, Sept. 18, 1917, to Apr. 7, 1918, staff gage, and Apr. 8, 1918, to Aug. 21, 1961, water-stage recorder at site 0.8 mile downstream at datum 3.36 ft lower.

Average discharge.--46 years, 435 cfs (314,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,740 cfs May 17 (gage height, 3.17 ft); maximum gage height, 3.64 ft Apr. 5 (ice jam); minimum daily discharge, 47 cfs Oct. 4-6, 9.

1904, 1915-61: Maximum discharge, 6,720 cfs June 11, 1923 (gage height, 6.24 ft, site then in use); maximum gage height, 8.80 ft Apr. 21, 1945 (ice jam); minimum daily discharge, 19 cfs July 17-19, 1934.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 130,000 acres of hay meadows above station. Transbasin diversions above station to Cache la Poudre River basin (see elsewhere in this report).

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 19 to May 13)

Oct. 1 to Aug. 21

Aug. 22 to Sept. 30

0.8	40	2.0	580	2.2	85	3.0	435
.9	62	3.0	1,500	2.4	115	3.5	770
1.0	94	4.0	2,730	2.6	235	4.0	1,200
1.5	305						

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	112	96	96	65	88	240	*526	1,400	770	325	97
2	53	98	100	94	66	88	280	636	1,470	629	330	109
3	49	91	110	94	64	88	400	629	1,520	508	330	154
4	47	112	100	92	64	88	470	698	1,580	432	300	222
5	47	119	94	90	66	88	540	706	*1,540	405	260	*262
6	47	116	86	86	67	92	520	629	1,440	449	228	294
7	49	105	92	82	*68	92	440	466	1,340	*365	210	284
8	49	112	100	76	68	*90	360	390	1,190	345	188	276
9	47	101	105	72	66	92	*290	360	1,260	320	*170	289
10	51	88	100	68	68	96	315	345	1,270	296	174	284
11	55	88	92	62	70	100	330	375	1,330	292	166	271
12	58	102	90	*56	72	100	260	502	1,400	405	162	248
13	58	98	88	58	70	106	255	615	*1,320	385	197	217
14	*65	96	86	60	74	118	260	643	1,240	350	246	186
15	81	90	78	60	76	134	275	1,010	1,370	416	215	170
16	84	94	82	60	78	160	275	1,460	1,250	416	174	154
17	94	98	86	58	78	178	295	1,670	1,110	365	158	182
18	105	102	94	58	78	194	400	1,270	980	335	166	266
19	108	102	94	58	84	198	556	810	971	320	174	258
20	101	*92	88	58	88	198	810	580	1,300	305	150	294
21	98	94	86	58	86	210	917	574	1,410	400	150	355
22	84	88	90	58	82	250	714	594	1,190	622	143	514
23	81	90	86	60	82	240	722	601	1,050	532	132	599
24	75	92	82	60	84	250	674	*622	874	400	112	632
25	78	98	80	60	82	294	556	730	874	360	106	618
26	78	94	86	56	76	276	454	794	850	340	126	618
27	78	82	78	56	78	256	416	826	730	315	154	710
28	78	76	74	58	86	230	390	866	574	310	129	762
29	72	76	70	60	-	215	395	962	532	395	100	826
30	91	84	78	60	-----	210	449	*1,010	594	335	91	1,160
31	88	-----	88	64	-----	220	-----	1,170	-----	310	91	-----
Total	2,207	2,890	2,759	2,088	2,086	5,039	13,258	23,069	34,959	12,427	5,657	11,311
Mean	71.2	96.3	89.0	67.4	74.5	163	442	744	1,165	401	182	377
Ac-ft	4,380	5,730	5,470	4,140	4,140	9,990	26,300	45,760	69,340	24,650	11,220	22,440

Calendar year 1960: Max 3,600 Min 47

Water year 1960-61: Max 1,670 Min 47

Mean 342

Mean 323

Ac-ft 248,300

Ac-ft 233,600

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Apr. 18. No gage-height record Dec. 12 to Mar. 28, June 6-13.

## PLATTE RIVER BASIN

13

6-6575. Laramie River near Glendevy, Colo.

Location.--Lat 40°48'00", long 105°52'40", in NW¼ sec.25, T.10 N., R.76 W., on left bank just upstream from Stub Creek, 180 ft downstream from bridge on county road, 250 ft downstream from Nunn Creek, and 1½ miles north of Glendevy Post Office.

Drainage area.--101 sq mi.

Records available.--June 1904 to October 1905, August 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Published as "at Glendevy" 1905, 1910-18.

Gage.--Water-stage recorder. Altitude of gage is 8,230 ft (from topographic map). Prior to Nov. 7, 1910, staff gage, water-stage recorder thereafter. Prior to Sept. 21, 1922, at datum 1.22 ft higher, Sept. 21, 1922, to Sept. 26, 1923, at datum 1.94 ft higher, July 9, 1929, to July 22, 1931, at datum 2.73 ft higher, and July 23, 1931, to Sept. 19, 1935, at datum 2.09 ft higher; all at site 180 ft upstream. Sept. 27, 1923, to July 8, 1929, at site 140 ft upstream at datum 1.35 ft higher.

Average discharge.--52 years, 73.5 cfs (53,210 acre-ft per year).

Extremes.--Maximum discharge during year, 730 cfs May 30 (gage height, 3.67 ft); minimum daily, 11 cfs Jan. 27. 1904-5, 1910-61: Maximum discharge, 2,240 cfs June 9, 1923 (gage height, 4.55 ft, site and datum then in use, from floodmarks), from rating curve extended above 1,400 cfs; minimum daily recorded, 5 cfs Feb. 14, 15, 1911, but may have been less during winter periods of no gage-height record.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 700 acres of hay meadows above station. Transbasin diversions above station to Cache la Poudre River and tributaries (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 8-15)

0.6	11	1.5	96	3.0	420
.8	20	2.0	174	3.5	610
1.0	36	2.5	280	3.7	710

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	24	16	14	16	15	15	46	580	154	42	20
2	26	24	16	13	16	16	16	59	*650	104	46	20
3	25	22	17	14	16	14	18	61	630	77	30	25
4	24	23	16	14	14	13	23	54	550	*82	24	30
5	24	21	15	14	14	14	*20	*50	480	111	22	*43
6	24	19	14	15	14	14	18	42	458	68	21	61
7	24	22	14	15	14	14	15	33	476	57	21	99
8	23	20	14	15	15	15	16	39	558	54	*21	86
9	24	18	15	15	15	17	16	43	*586	45	25	73
10	26	20	16	*16	16	17	15	57	606	44	21	72
11	25	22	16	17	16	16	15	103	570	49	19	65
12	26	19	16	17	14	16	15	145	530	57	22	62
13	*26	18	16	16	14	17	16	88	526	56	31	57
14	31	18	17	15	14	18	15	67	554	55	32	55
15	32	18	17	17	14	19	14	86	526	55	24	52
16	32	24	16	17	14	20	14	96	476	49	31	52
17	34	19	15	17	14	18	15	99	458	48	72	61
18	32	19	16	16	13	16	20	120	444	43	33	58
19	30	18	16	14	14	14	33	138	455	40	26	77
20	27	18	15	15	15	15	43	172	513	45	24	76
21	26	20	15	15	16	16	33	222	510	77	28	81
22	25	18	16	16	16	16	31	263	494	63	24	95
23	25	20	17	17	16	17	32	295	466	50	21	90
24	25	*20	13	16	14	17	27	325	444	47	21	85
25	24	16	17	15	15	*16	24	328	411	46	26	78
26	21	16	16	12	15	15	21	351	273	54	24	85
27	22	16	15	11	12	15	22	430	212	48	22	85
28	22	15	14	13	14	14	25	502	167	34	20	93
29	18	15	14	14	-	14	30	578	142	32	20	123
30	24	16	15	15	-----	15	42	625	140	27	20	99
31	23	-----	14	17	-----	14	-----	670	-----	30	20	-----
Total	796	573	484	467	410	487	659	6192	14,015	1,801	833	2,058
Mean	25.7	19.3	15.6	15.1	14.6	15.7	22.0	200	467	58.1	26.9	68.6
Ac-ft	1,580	1,150	960	926	813	966	1,310	12,280	27,800	3,570	1,650	4,080

Calendar year 1960: Max 510 Min 11 Mean 63.3 Ac-ft 45,920

Water year 1960-61: Max 680 Min 11 Mean 78.8 Ac-ft 57,080

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9, 10, 17, 18, 20, 28-30, Dec. 5 to Feb. 10, Feb. 13, 18, 19, 21, 22, 24, 27, Mar. 29, Apr. 15. No gage-height record Feb. 28 to Mar. 25 (stage-discharge relation affected by ice during part of period).



## PLATTE RIVER BASIN

6-6950. South Platte River above Elevenmile Canyon Reservoir, near Hartsel, Colo.

Location.--Lat 38°58'03", long 105°34'51", in sec.32, T.12 S., R.73 W., on left bank 250 ft downstream from highway bridge, 2.5 miles upstream from water line of Elevenmile Canyon Reservoir at elevation 8,561 ft, and 13 miles southeast of Hartsel.

Drainage area.--880 sq mi.

Records available.--June 1933 to September 1961 (no winter records prior to 1940). Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,590 ft (from topographic map). Prior to May 27, 1939, water-stage recorder near present site at different datum.

Average discharge.--22 years (1939-61), 80.9 cfs (58,570 acre-ft per year).

Extremes.--Maximum daily discharge during year, 600 cfs (estimated) Aug. 3; minimum, 1.7 cfs June 10.

1933-61: Maximum discharge recorded, 1,290 cfs June 19, 1949; maximum gage height, 5.22 ft July 22, 1957; minimum daily discharge recorded, 0.9 cfs Apr. 22, 1940.

Remarks.--Records good prior to July 26 and fair thereafter except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Antero Reservoir (capacity, 22,300 acre-ft). Many small diversions above station for irrigation of about 24,000 acres.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 25

July 26 to Sept. 30

0.0	1.0	1.0	43	0.6	105
.2	4.0	1.3	82	1.0	164
.6	16	2.0	222	2.0	400
.8	27			2.8	620

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	26						9.1	12	176	390	130
2	20	*29						8.2	5.5	174	480	150
3	20	26						8.5	2.7	150	600	180
4	20	26						12	6.1	134	350	280
5	20	25						16	14	118	220	400
6	20	26						14	10	126	190	494
7	20	27						14	7.3	130	170	*430
8	20	23						16	4.0	128	170	281
9	20	20						15	2.1	124	*168	235
10	23	b19						14	1.7	114	180	220
11	23							*14	3.2	92	150	208
12	22							13	*11	79	140	178
13	21							13	13	*82	160	170
14	20		(*)					11	12	60	190	136
15	25							4.9	16	56	260	128
16	32	(*)	22	11	15	37		4.3	23	72	230	132
17	36							3.5	38	60	190	139
18	41							2.4	30	62	175	130
19	46							2.7	31	60	155	160
20	40							9.1	53	80	130	182
21	*43	b15						11	34	64	122	172
22	41							11	32	70	*138	*158
23	40							8.8	28	60	130	170
24	39							6.4	29	72	116	210
25	37							3.0	30	*90	118	240
26	35							15	33	110	125	199
27	33							*12	10	74	280	172
28	35							12	7.6	132	150	283
29	34		(*)					4.6	*1.78	190	230	142
30	30							11	5.8	172	296	206
31	30							7.6		450	132	120
Total	906	547	682	341	420	1147	1812	284.3	1037.6	3799	6578	6102
Mean	29.2	18.2	22	11	15	37	60.4	9.17	34.6	123	212	203
Ac-ft	1,800	1,080	1,350	676	833	2,280	3,590	564	2,060	7,540	13,050	12,100

Calendar year 1960: Max 800 Min - Mean 49.6 Ac-ft 36,000  
 Water year 1960-61: Max 600 Min 1.7 Mean 64.8 Ac-ft 46,920

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 16 to Apr. 26 (stage-discharge relation affected by ice during most of period) July 20 to Aug. 20, Aug. 26, 27, Sept. 2-4, 10, 17, 23, 24, 30.

6-6960. South Platte River near Lake George, Colo.

Location.--Lat 38°54'19", long 105°28'22", in SW $\frac{1}{4}$  sec.20, T.13 S., R.72 W., on left bank 700 ft downstream from Elevenmile Canyon Reservoir and 8.2 miles southwest of town of Lake George.

Drainage area.--963 sq mi.

Records available.--October 1929 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,458 ft (from topographic map). Prior to Oct. 26, 1940, at site 1 mile downstream at datum 8,423.95 ft above mean sea level, adjustment of 1912.

Average discharge.--32 years, 69.1 cfs (50,030 acre-ft per year).

Extremes.--Maximum discharge during year, 523 cfs Aug. 5 (gage height, 3.96 ft); minimum daily, 1.4 cfs June 9.

1929-61: Maximum discharge, 990 cfs Aug. 15, 1930, from rating curve extended above 600 cfs; maximum gage height, 5.85 ft June 20, 1949; no flow at times in January 1930, February 1931, November 1935.

Remarks.--Records good. Natural flow of stream affected by transmountain diversions through East and West Hoosier ditches at Hoosier Pass prior to 1941, storage in Elevenmile Canyon Reservoir (see elsewhere in this report) and Antero Reservoir (capacity, 22,300 acre-ft), diversions for irrigation, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.0	0	1.0	60
.1	2.0	1.5	115
.2	4.0	2.0	182
.3	8.0	3.0	337
.5	19	4.0	531

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	6.4	*7.2	22	8.5	13	93	5.6	2.4	134	379	87
2	5.2	*2.8	7.6	22	9.5	13	93	7.2	2.4	154	455	45
3	5.2	2.8	8.0	22	9.0	17	93	6.0	2.2	153	453	120
4	5.6	2.6	12	21	9.5	20	95	7.2	2.4	148	445	279
5	5.2	2.4	12	20	10	20	100	6.8	2.4	150	465	401
6	5.2	2.6	15	20	10	20	101	6.0	2.2	153	401	*441
7	5.2	4.0	14	19	9.0	20	119	5.2	2.2	153	206	441
8	5.6	3.6	15	18	9.5	20	130	6.8	2.2	150	214	310
9	5.6	3.6	15	18	8.5	20	127	6.8	1.4	147	*270	284
10	5.2	3.8	18	*17	8.5	20	126	7.2	2.2	144	87	250
11	5.2	3.8	19	16	8.5	20	123	8.0	2.4	137	51	141
12	5.2	4.8	20	15	8.5	20	122	7.2	*2.0	134	123	210
13	5.2	6.0	22	14	8.5	21	108	6.4	2.0	131	181	204
14	5.2	6.8	*22	13	8.5	21	84	7.6	2.0	93	244	113
15	5.2	8.5	23	12	8.5	*22	54	4.8	2.0	79	301	77
16	5.2	*6.4	23	12	8.5	23	36	4.8	2.6	79	303	111
17	5.2	5.6	22	12	9.0	33	53	3.8	3.8	79	306	188
18	5.2	4.8	22	12	9.5	47	53	3.8	3.8	46	200	188
19	5.2	4.0	23	12	11	46	20	3.2	3.8	25	117	200
20	5.2	5.2	22	12	12	46	3.6	3.2	3.6	21	117	232
21	*5.2	5.6	22	12	12	46	4.0	3.0	4.8	25	141	129
22	5.2	4.8	22	11	12	53	5.2	2.6	6.4	52	*105	*41
23	5.2	6.4	22	10	13	56	6.4	2.6	4.8	98	68	128
24	5.2	6.8	23	10	14	66	6.4	2.6	4.4	113	96	234
25	5.2	6.0	23	*10	14	73	6.8	2.4	4.8	*110	103	282
26	4.8	6.4	24	10	15	72	*6.8	*2.8	5.6	94	158	157
27	4.8	9.0	24	10	17	77	6.0	2.6	8.5	56	178	22
28	5.2	7.6	*25	9.5	*13	*81	5.6	2.8	15	90	218	23
29	7.2	6.4	25	9.5	-	90	6.0	2.8	*40	131	265	29
30	6.4	6.4	24	9.0	-----	94	5.6	3.6	8.9	144	186	27
31	5.2	-----	23	3.5	-----	94	-----	2.4	-----	1.93	158	-----
Total	164.8	155.0	593.8	438.5	299.5	1,294	1,792.4	1,47.8	233.3	3,416	6,999	5,394
Mean	5.32	5.20	19.3	14.1	10.7	41.7	59.7	4.77	7.78	110	226	180
Ac-ft	327	309	1,190	870	594	2,570	3,560	293	463	6,780	13,880	10,700

Calendar year 1960: Max 491 Min 1.6 Mean 45.5 Ac-ft 33,010  
 Water year 1960-61: Max 465 Min 1.4 Mean 57.4 Ac-ft 41,540

\* Discharge measurement made on this day.

## PLATTE RIVER BASIN

6-7005. Goose Creek above Cheesman Lake, Colo.  
(Known also as Lost Park Creek)

Location--Lat 39°12'32", long 105°18'11", in sec.2, T.10 S., R.71 W., on right bank 1 mile upstream from water line of Cheesman Lake at elevation 6,842 ft.

Drainage area--86.6 sq mi.

Records available--August to December 1899, October 1924 to September 1961 (no winter records in some years). Monthly discharge only for some periods, published in WSP 1310. Published as "at Lake Cheesman" 1899.

Gage--Water-stage recorder and compound rectangular weir. Altitude of gage is 6,910 ft (from topographic map). Aug. 1 to Dec. 31, 1899, staff gage at site about 2 miles downstream at different datum.

Average discharge--24 years (1924-30, 1935-36, 1939-41, 1943-47, 1950-61), 27.3 cfs (19,760 acre-ft per year).

Extremes--Maximum discharge during year, 160 cfs July 28 (gage height, 2.44 ft); minimum not determined.

1924-61: Maximum discharge, 487 cfs June 9, 1957 (from rating curve extended above 170 cfs); maximum gage height, 4.57 ft May 30, 1942; minimum discharge not determined.

Remarks--Records good except those for period of no gage-height record, which are poor. Small diversions above station for irrigation of about 100 acres.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	5.0	1.5	55
.5	10	2.0	100
.7	16	3.0	253
1.0	28		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.0		(*)					67	71	49	77	44
2	6.8							71	71	34	74	41
3	7.0	(*)						74	74	40	67	71
4	7.0							78	84	30	51	78
5	7.0							59	72	30	39	79
6	7.2							38	67	53	34	118
7	6.8							38	62	44	41	125
8	7.0							33	58	41	53	106
9	7.0						13	34	*60	43	*53	88
10	7.8							*62	57	32	44	81
11	8.8							85	60	28	45	80
12	8.0							96	53	30	70	78
13	7.8							89	47	*30	55	74
14	8.2							48	54	26	57	74
15	10	3	5.5	5	6.5	9		58	86	26	57	71
16	9.2						12	64	66	26	49	70
17	12						*14	69	51	24	66	70
18	15						16	70	43	22	92	68
19	12						20	74	40	21	61	76
20	*16						27	72	53	21	54	87
21	12						32	70	45	24	51	78
22	14						40	72	36	31	50	70
23	13						44	74	33	23	48	80
24	12						45	73	33	20	45	88
25	12						34	*73	33	20	52	84
26	15						*30	78	32	20	69	93
27	14						25	75	32	26	52	76
28	19						26	73	31	41	44	67
29	27						29	79	*40	44	40	63
30	16						52	74	36	50	40	62
31	15							71		66	59	
Total	346.6	240	170.5	155	182	279	641	2091	1580	1015	1689	2340
Mean	11.2	8	5.5	5	6.5	9	21.4	67.5	52.7	32.7	54.5	78.0
Ac-ft	687	476	338	307	361	553	1,270	4,150	3,130	2,010	3,350	4,640

Calendar year 1960: Max 151 Min - Mean 25.7 Ac-ft 18,690  
Water year 1960-61: Max 125 Min - Mean 29.4 Ac-ft 21,270

Peak discharge (base, 110 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-12	8a.m.	2.25	140	8-18	8a.m.	2.13	117
7-28	4p.m.	2.44	160	9-7	9a.m.	2.43	158
8-1	2p.m.	2.26	134	9-26	6a.m.	2.09	112

\* Discharge measurement made on this day.  
Note.--No gage-height record Oct. 21 to Apr. 21 (stage-discharge relation affected by ice during most of period).

6-7015. South Platte River below Cheesman Lake, Colo.

Location.--Lat 39°12'33", long 105°16'02", in SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec.6, T.10 S., R.70 W., on left bank 1,400 ft downstream from toe of Cheesman Dam.

Drainage area.--1,752 sq mi.

Records available.--October 1924 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 6,609.29 ft above mean sea level, datum of 1929. Prior to May 14, 1956, at site 370 ft upstream at datum 0.50 ft higher.

Average discharge.--37 years, 155 cfs (112,200 acre-ft per year).

Extremes.--Maximum discharge during year, 628 cfs Aug. 17 (gage height, 2.92 ft); minimum daily, 4.3 cfs Oct. 19.

1924-61: Maximum discharge, 3,020 cfs Apr. 23, 1942 (gage height, 8.46 ft, site and datum then in use), from rating curve extended above 1,800 cfs; minimum daily determined, 1.6 cfs Apr. 8-14, 1957.

Remarks.--Records good. Natural flow of stream affected by transmountain diversions (see elsewhere in this report) Elevenmile Canyon Reservoir and Cheesman Lake (see elsewhere in this report), diversions for irrigation of about 40,000 acres, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.1	1.2	0.4	23	1.5	216
.2	5.1	.6	50	2.0	343
.3	13	1.0	113	3.0	656

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	32	*3.3	5.9	5.9	111	104	43	43	159	391	391
2	25	37	8.3	5.9	13	111	104	103	44	183	503	329
3	44	*40	8.3	5.9	27	113	104	119	20	223	265	308
4	73	42	8.3	5.9	32	113	75	117	19	214	263	303
5	87	39	8.3	5.9	33	113	32	117	19	242	472	13
6	87	33	8.3	5.9	37	124	13	101	19	362	578	13
7	84	33	8.3	5.9	39	130	8.3	84	19	374	484	13
8	73	33	8.3	5.9	46	130	7.5	91	18	371	343	13
9	75	32	8.3	*5.9	60	130	7.5	*89	*18	408	*311	13
10	75	26	8.3	5.9	70	130	7.5	97	18	538	327	13
11	75	26	8.3	5.9	72	128	7.5	179	17	525	189	13
12	67	22	8.3	5.9	72	128	7.5	247	17	503	298	13
13	51	21	8.3	5.9	72	128	7.5	287	16	478	343	13
14	35	22	7.5	5.9	39	128	7.5	198	17	429	500	13
15	18	*16	7.5	5.9	28	128	6.7	124	16	316	558	14
16	21	9.0	7.5	5.9	30	128	5.9	11	15	308	545	13
17	24	9.0	6.7	5.9	50	128	*5.9	11	14	295	574	13
18	25	9.0	6.7	5.9	54	128	5.9	11	14	257	598	13
19	4.3	8.3	6.7	5.9	54	128	5.9	15	11	238	441	129
20	*19	8.3	5.9	5.9	54	128	6.7	18	38	203	346	188
21	50	8.3	5.9	5.9	54	128	6.7	19	68	175	300	22
22	42	8.3	5.9	5.9	54	128	6.7	19	96	175	308	22
23	36	8.3	5.9	5.9	54	128	6.7	19	146	203	*277	18
24	36	8.3	5.9	5.9	54	121	7.5	18	111	245	216	11
25	42	8.3	5.9	5.9	54	104	7.5	18	111	287	287	11
26	46	8.3	5.9	5.9	54	104	*7.5	17	96	316	311	11
27	47	8.3	5.9	5.9	*70	*104	7.5	17	54	311	379	11
28	50	8.3	*5.9	5.9	99	106	7.5	15	49	277	447	18
29	50	8.3	5.9	5.9	-	104	7.5	17	*47	292	414	28
30	44	8.3	5.9	5.9	-----	104	7.5	17	70	324	475	35
31	32	-----	5.9	5.9	-----	104	-----	11	-----	319	484	-----
Total	1,465.3	580.6	221.3	1,82.9	1,380.9	3,720	603.4	2,250	1,260	9,551	12,227	2,018
Mean	47.3	19.4	7.14	5.90	49.3	120	20.1	72.6	42.0	308	394	67.3
Ac-ft	2,910	1,150	439	363	2,740	7,380	1,200	4,460	2,500	18,940	24,250	4,000

Calendar year 1960: Max 493 Min 4.3 Mean 104 Ac-ft 75,820  
 Water year 1960-61: Max 598 Min 4.3 Mean 97.2 Ac-ft 70,330

\* Discharge measurement made on this day.



## PLATTE RIVER BASIN

6-7060. North Fork South Platte River below Geneva Creek, at Grant, Colo.

Location.--Lat 39°27'28", long 105°39'28", in NW $\frac{1}{4}$  sec.10, T.7 S., R.74 W., on left bank just east of Grant, 1,600 ft downstream from Geneva Creek.

Drainage area.--127 sq mi.

Records available.--July 1908 to November 1913 (published as "at Cassells"), June 1942 to September 1961. Monthly discharge only for some periods, published in WSP 1310. December 1913 to March 1918 equivalent records may be obtained by summation of flow of North Fork South Platte River at Grant (above Geneva Creek) and Geneva Creek at Grant.

Gage.--Water-stage recorder. Datum of gage is 8,558.60 ft above mean sea level (Bureau of Reclamation bench mark). July 4 to Dec. 13, 1908, and May 23 to Nov. 30, 1913, staff gages at site 185 ft downstream from bridge at Santa Maria (formerly Cassells) about 2 miles downstream at various datums. Dec. 14, 1908, to May 22, 1913, chain gage on bridge at Santa Maria about 2 miles downstream at different datum. June 19, 1942, to Mar. 15, 1948, staff gage at site 1,200 ft upstream from present site at datum 13.07 ft higher. Mar. 16 to July 22, 1948, staff gage at site 400 ft upstream from present site at datum 6.35 ft higher than present datum.

Average discharge.--24 years, 75.3 cfs (54,510 acre-ft per year).

Extremes.--Maximum discharge during year, 250 cfs July 31 (gage height, 3.60 ft); minimum daily, 14 cfs Jan. 29 to Feb. 10.

1908-13, 1942-61: Maximum discharge observed, 990 cfs June 7, 8, 1912 (gage height, 3.30 ft, site and datum then in use), from rating curve extended above 530 cfs by logarithmic plotting; maximum gage height, 4.72 ft, present site, Feb. 11, 1952 (backwater from ice); minimum daily discharge, 6.5 cfs Nov. 27, 1958.

Remarks.--Records good. Discharge measurements generally made two or more times a month. Small diversions above station for irrigation of about 200 acres.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

2.4	13	3.0	85
2.5	19	3.3	155
2.7	38	3.7	285

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	29	24	18	14	16	17	45	161	119	170	85
2	22	27	24	17	14	17	19	45	179	124	147	87
3	22	26	24	17	14	17	24	46	170	117	128	131
4	22	26	24	17	14	17	29	46	144	121	104	119
5	22	26	21	17	14	17	24	41	131	128	91	128
6	21	26	21	17	14	17	20	34	128	117	85	150
7	22	27	22	17	14	17	20	35	133	126	83	155
8	22	26	23	17	14	17	18	35	158	117	87	139
9	25	18	22	17	14	17	17	42	185	104	78	133
10	26	21	23	17	14	17	18	54	179	104	73	131
11	25	24	22	17	15	17	18	73	167	102	78	128
12	24	23	22	17	15	17	17	82	167	106	89	119
13	23	22	22	17	15	17	18	76	158	96	91	115
14	27	21	22	17	15	17	18	54	155	87	144	110
15	25	18	21	17	15	17	16	54	155	85	133	108
16	29	18	20	17	17	18	18	55	147	78	126	113
17	30	21	20	17	17	18	19	62	155	73	173	115
18	30	19	20	17	17	17	25	73	155	70	144	108
19	26	19	21	17	15	17	32	93	155	70	113	113
20	29	18	21	17	15	17	38	104	167	65	106	119
21	28	20	20	16	15	17	28	110	158	75	102	121
22	26	20	20	16	15	17	28	131	152	73	96	117
23	29	18	20	16	15	18	34	133	144	58	91	124
24	28	20	19	16	15	21	29	126	139	55	91	115
25	26	21	19	15	15	20	22	139	133	55	106	104
26	25	22	19	15	15	18	20	133	126	71	106	104
27	26	22	19	15	15	18	22	152	124	71	93	104
28	28	17	19	15	15	17	26	158	121	73	93	102
29	26	20	19	14	-	17	35	153	115	73	82	104
30	31	24	18	14	-----	18	45	164	119	104	93	93
31	51	-----	18	14	-----	17	-----	155	-----	121	100	-----
Total	818	659	649	507	426	539	714	2,708	4,480	2,838	3,296	3,494
Mean	26.4	22.0	20.9	16.4	15.2	17.4	23.8	87.4	149	91.5	106	116
Ac-ft	1,620	1,310	1,290	1,010	845	1,070	1,420	5,370	8,890	5,630	6,540	6,930

Calendar year 1960: Max 340 Min 11 Mean 65.1 Ac-ft 47,280  
 Water year 1960-61: Max 185 Min 14 Mean 57.9 Ac-ft 41,920

Peak discharge (base, 450 cfs).--No peak above base.

## PLATTE RIVER BASIN

19

6-7070. North Fork South Platte River at South Platte, Colo.

Location.--Lat 39°24'30", long 105°10'30", in SW $\frac{1}{4}$  sec.25, T.7 S., R.70 W., on left bank 0.2 mile west of South Platte and 0.3 mile upstream from mouth.

Drainage area.--479 sq mi.

Records available.--June 1909 to September 1910, April 1913 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder. Datum of gage is 6,090.55 ft above mean sea level, adjustment of 1912. Prior to May 13, 1925, staff gage at same site and datum.

Average discharge.--49 years, 158 cfs (114,400 acre-ft per year).

Extremes.--Maximum discharge during year, 439 cfs Sept. 7 (gage height, 3.12 ft); minimum daily, 24 cfs Dec. 6, Jan. 27.

1909-10, 1913-61: Maximum discharge, 2,050 cfs June 13, 1949 (gage height, 6.30 ft); minimum observed, 4.0 cfs Dec. 8, 1932 (discharge measurement).

Remarks.--Records good except those for periods of no gage-height record, which are poor. Discharge measurements generally made twice each month. Small diversions above station for irrigation of about 2,000 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	22	2.4	151
1.6	32	2.7	260
1.8	49	3.0	385
2.1	85	3.5	620

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	5.5	3.8	3.4	2.3	4.6	5.3	1.23	3.08	2.32	3.54	2.09
2	4.4	5.4	3.5	3.2	2.9	5.0	5.4	1.28	3.16	2.20	3.49	2.05
3	4.4	5.1	3.8	3.1	3.0	5.2	6.6	1.30	3.28	2.20	3.62	3.00
4	4.2	5.1	3.8	3.1	3.1	5.1	8.4	1.33	3.20	2.01	2.92	2.88
5	4.1	5.1	2.8	3.3	3.1	4.6	8.8	1.33	2.88	2.28	2.52	2.96
6	4.1	4.7	2.4	3.5	2.9	4.8	6.2	1.18	2.68	2.32	2.24	3.67
7	4.0	5.2	2.9	3.7	2.9	5.0	5.2	1.12	2.72	2.24	2.32	3.90
8	4.0	5.3	2.9	3.9	3.1	5.2	5.0	1.14	3.08	2.32	2.48	3.76
9	3.8	4.0	3.4	4.0	3.3	5.3	5.2	1.12	3.36	2.36	2.36	3.54
10	4.3	3.4	3.9	3.8	3.4	5.2	5.4	1.12	3.44	2.20	2.16	3.36
11	4.9	5.3	4.0	3.7	3.6	5.4	5.4	1.28	3.36	1.97	2.24	3.28
12	4.8	4.9	3.8	3.8	3.8	5.4	5.4	1.66	3.28	2.24	2.60	3.12
13	4.4	4.9	3.8	3.7	3.5	5.3	5.4	2.09	3.20	2.01	2.56	2.96
14	4.3	4.5	4.2	3.5	3.5	5.1	4.9	1.70	3.32	1.86	3.00	2.88
15	6.3	3.4	4.1	3.4	3.9	4.8	5.6	1.66	3.85	1.79	3.00	2.84
16	5.5	3.8	4.1	3.5	3.9	4.6	6.8	1.66	3.44	1.66	2.72	2.72
17	6.0	4.4	4.0	3.5	3.7	4.3	7.7	1.82	3.28	1.60	3.16	2.84
18	7.4	4.9	3.9	3.4	3.6	3.9	8.6	1.93	3.12	1.51	3.28	2.64
19	7.4	4.7	4.2	2.5	3.6	4.2	9.6	2.24	3.20	1.46	2.64	2.68
20	6.9	4.6	4.5	2.7	3.7	4.1	1.10	2.60	3.54	1.43	2.36	3.00
21	6.6	4.3	4.7	2.6	4.0	4.9	1.18	2.84	3.24	1.54	2.28	2.84
22	6.1	4.4	4.4	2.6	4.1	4.4	1.00	2.92	3.08	1.79	2.16	2.84
23	6.1	4.3	4.5	2.7	4.3	5.1	1.07	3.08	2.92	1.46	2.09	3.08
24	6.0	4.8	4.6	2.8	4.0	5.9	1.10	2.80	2.84	1.30	1.97	3.20
25	5.9	4.8	4.6	2.9	3.8	6.9	1.00	2.84	2.76	1.30	2.16	2.84
26	5.8	4.9	4.4	2.5	3.9	6.1	9.4	2.84	2.56	1.35	2.56	2.84
27	5.8	4.1	4.3	2.4	4.0	5.5	8.9	3.04	2.48	1.60	2.12	2.68
28	5.9	3.2	4.3	2.5	4.1	4.9	8.9	3.20	2.44	1.57	2.16	2.60
29	5.9	3.4	3.6	2.6	-	4.2	9.4	3.16	2.36	1.57	1.97	2.56
30	5.2	4.4	3.3	2.9	-----	5.2	1.05	3.28	2.24	2.09	1.93	2.40
31	4.4	-----	3.3	2.7	-----	5.5	-----	3.08	-----	2.76	2.56	-----
Total	1.638	1.368	1.198	979	995	1.557	2.325	6.387	9.139	5.831	7.917	8805
Mean	52.8	45.6	38.6	31.6	35.5	50.2	77.5	206	305	188	255	294
Ac-ft	3,250	2,710	2,380	1,940	1,970	3,090	4,610	12,670	18,130	11,570	15,700	17,460

Calendar year 1960: Max 493 Min 24 Mean 121 Ac-ft 87,590

Water year 1960-61: Max 390 Min 24 Mean 132 Ac-ft 95,480

Peak discharge (base, 450 cfs).--No peak above base.

Note.--No gage-height record Dec. 17 to Mar. 17 (stage-discharge relation affected by ice during most of period), Apr. 3-25.

## PLATTE RIVER BASIN

6-7075. South Platte River at South Platte, Colo.

Location.--Lat 39°24'30", long 105°10'10", in SE $\frac{1}{4}$  sec. 25, T.7 S., R.70 W., on left bank at South Platte, 200 ft downstream from bridge on State Highway 75 and 400 ft downstream from North Fork.

Drainage area.--2,579 sq mi.

Records available.--July 1887 to September 1891, May to October 1892, October 1895 to September 1897, October 1898 to June 1900, October 1900 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Published as "at" or "near Deansbury," "at Deansbury and Platte Canyon," "at," or "near Platte Canyon," prior to 1901, and as "below North Fork, at South Platte" 1914.

Gage.--Water-stage recorder. Datum of gage is 6,078.43 ft above mean sea level, adjustment of 1912. Prior to Mar. 28, 1902, staff gages or water-stage recorder at several sites less than 9 miles downstream at various datums. Mar. 28, 1902, to May 6, 1905, staff gage at bridge 200 ft upstream at different datum. May 7, 1905, to Mar. 13, 1910, staff gage at present site and datum.

Average discharge.--68 years (1887-91, 1895-97, 1898-99, 1900-61), 357 cfs (258,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,160 cfs Aug. 18 (gage height, 4.05 ft); minimum daily, 38 cfs Dec. 7. 1887-92, 1895-97, 1898-1961: Maximum discharge, 6,320 cfs June 8, 1921 (gage height, 8.95 ft), from rating curve extended above 3,500 cfs; minimum daily determined, 10 cfs Dec. 5, 1899.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain diversions (see elsewhere in this report), Elevenmile Canyon Reservoir and Cheesman Lake (see elsewhere in this report), diversions above station for irrigation of about 45,000 acres, and return flow from irrigated areas.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 19-29)

0.9	34	2.5	301
1.3	64	3.0	492
1.6	103	3.5	750
2.0	176	4.1	1,160

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	106	60	52	62	150	189	186	376	361	786	684
2	79	105	61	48	62	190	191	253	435	410	1,010	615
3	79	109	58	48	64	195	206	295	414	443	933	700
4	103	109	58	46	70	185	242	295	395	439	502	712
5	128	108	50	48	70	170	218	298	358	443	774	502
6	135	100	44	52	74	180	164	281	344	595	870	478
7	135	102	33	54	80	190	132	253	344	615	864	511
8	124	103	45	56	92	190	126	253	376	630	678	483
9	119	97	50	58	100	195	103	258	402	630	580	447
10	124	84	54	56	120	202	119	248	402	792	630	422
11	130	102	64	56	125	206	119	311	391	768	474	410
12	126	98	62	58	145	202	116	418	379	768	570	387
13	108	94	60	56	160	199	a116	565	364	717	656	353
14	106	92	60	56	150	204	a122	452	383	695	834	354
15	108	83	60	56	135	206	a118	414	465	545	1,000	340
16	85	67	60	58	120	213	a130	298	418	511	919	333
17	98	66	54	60	115	220	a134	284	387	506	1,010	340
18	130	74	56	56	110	213	a150	292	361	460	1,100	320
19	126	75	58	52	100	206	a170	323	364	435	822	327
20	102	75	64	52	100	202	213	364	402	406	662	620
21	121	74	62	54	105	206	208	387	406	383	585	361
22	130	78	60	56	110	204	191	395	398	406	565	350
23	119	68	62	56	115	213	191	410	460	376	560	368
24	116	76	64	52	105	223	195	379	431	395	456	391
25	116	80	62	50	100	218	186	383	414	443	521	358
26	119	79	60	52	110	208	174	379	391	502	620	358
27	121	78	58	52	115	202	160	398	340	526	620	333
28	128	64	60	56	120	202	154	410	314	492	739	327
29	132	49	60	60	-	184	156	402	307	497	662	323
30	123	52	54	62	-----	193	170	402	295	575	700	314
31	102	-----	52	64	-----	193	-----	379	-----	684	858	-----
Total	3,551	2,547	1,770	1,692	2,934	6,169	4,863	10,665	11,516	16,448	22,560	12,826
Mean	115	84.9	57.1	54.6	105	199	162	344	384	531	728	428
Ac-ft	7,040	5,050	3,510	3,360	5,820	12,240	9,650	21,150	22,840	32,620	44,750	25,440

Calendar year 1960: Max 810 Min 28 Mean 255 Ac-ft 185,200  
Water year 1960-61: Max 1,100 Min 38 Mean 267 Ac-ft 193,500

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 30 to Mar. 8.

6-7080. South Platte River at Waterton, Colo.

Location.--Lat 39°29'18", long 105°05'32", in NE $\frac{1}{4}$  sec. 34, T.6 S., R.69 W., on left bank 250 ft downstream from bridge on State Highway 221, half a mile east of Waterton, 5 miles west of Louviers, and 6 miles upstream from Plum Creek.

Drainage area.--2,621 sq mi.

Records available.--May 1926 to September 1961. Monthly discharge only prior to 1934, published in WSP 1310.

Gage.--Water-stage recorder. Datum of gage is 5,484.43 ft above mean sea level, adjustment of 1912.

Average discharge.--35 years, 175 cfs (126,700 acre-ft per year).

Extremes.--Maximum discharge during year, 864 cfs Aug. 2 (gage height, 2.43 ft); minimum daily, 3.0 cfs Feb. 3.

1926-61: Maximum discharge, 5,700 cfs Apr. 23, 1942 (gage height, 5.68 ft); minimum daily, 0.1 cfs Mar. 6, 7, 1933, Feb. 28 to Mar. 2, Mar. 20, 1938.

Remarks.--Records good. Natural flow of stream affected by transmountain diversions (see elsewhere in this report), Elevenmile Canyon Reservoir and Cheesman Lake (see elsewhere in this report), diversions for irrigation of about 55,000 acres and municipal use, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.6	3.0	1.4	213
.7	10	2.0	570
.9	46	2.5	970
1.1	100		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	61	20	18	3.7	126	24	88	48	88	544	420
2	6.4	6.4	21	18	3.7	*100	24	*159	94	192	*704	339
3	5.4	42	20	9.5	3.0	*38	26	236	61	200	612	440
4	51	38	28	8.6	3.7	30	44	246	43	192	159	427
5	51	32	20	13	3.7	23	71	246	34	187	394	251
6	5.4	28	20	13	*4.4	*23	36	232	24	345	479	*204
7	51	24	*28	13	4.4	24	*26	192	*28	394	550	236
8	40	24	34	13	5.8	23	28	192	42	420	388	209
9	38	*21	38	16	12	24	26	187	56	401	304	179
10	44	18	23	20	*20	24	26	179	54	388	440	155
11	48	16	38	20	24	26	26	170	51	*388	388	133
12	42	20	38	18	24	24	26	251	33	401	388	113
13	46	16	*30	*13	28	24	24	427	30	339	466	91
14	54	32	24	10	46	26	23	401	42	304	626	80
15	83	26	28	8.6	44	26	23	*218	174	282	696	66
16	58	20	28	6.5	21	24	23	58	88	251	564	54
17	66	16	28	7.2	21	26	23	38	77	241	619	66
18	113	13	24	6.5	21	26	23	38	34	204	752	54
19	123	16	24	6.5	30	30	*28	42	36	159	584	77
20	*88	10	24	6.5	32	26	40	68	94	159	408	388
21	100	7.9	23	7.9	*32	*26	38	166	*148	144	375	*133
22	113	8.6	18	6.5	34	28	36	155	144	174	453	103
23	107	10	23	6.5	61	32	42	144	123	144	460	126
24	100	26	23	*6.5	44	42	66	80	64	148	357	155
25	97	32	21	6.5	34	51	116	*88	38	*174	*357	152
26	100	42	21	5.8	44	38	123	155	97	222	486	166
27	103	23	21	7.9	64	30	100	140	107	260	440	126
28	107	20	22	8.6	83	26	80	103	66	232	584	123
29	113	15	23	5.8	-	24	51	74	58	232	512	152
30	107	21	26	4.4	-----	26	56	74	40	310	531	133
31	77	-----	21	4.4	-----	26	-----	51	-----	420	591	-----
Total	2,336	7,425	780	3,155	7,514	1,042	1,298	4,899	2,038	7,995	15,211	3,351
Mean	75.4	24.8	25.2	10.2	26.8	33.6	43.3	158	67.9	258	491	178
Ac-ft	4,630	1,470	1,550	626	1,490	2,070	2,570	9,720	4,040	15,860	30,170	10,610

Calendar year 1960: Max 664 Min 3.0 Mean 133 Ac-ft 96,270  
 Water year 1960-61: Max 752 Min 3.0 Mean 117 Ac-ft 84,810

\* Discharge measurement made on this day.



## PLATTE RIVER BASIN

6-7095. Plum Creek near Louviers, Colo.

Location--Lat 39°29'04", long 105°00'07", in SE $\frac{1}{4}$  sec. 33, T.6 S., R.68 W., on right bank at downstream side of bridge on county road from U. S. Highway 85 to Louviers, three-quarters of a mile northeast of Louviers,  $1\frac{1}{4}$  miles downstream from Indian Creek, and  $7\frac{1}{2}$  miles upstream from mouth.

Drainage area--302 sq mi.

Records available--October 1947 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 5,585 ft (from topographic map). Prior to Feb. 12, 1957, at site  $2\frac{1}{2}$  miles downstream prior to Oct. 1, 1954, at datum 5,518.71 ft above mean sea level, datum of 1929, and Oct. 1, 1954, to Feb. 11, 1957, at datum 5,517.19 ft above mean sea level, datum of 1929.

Average discharge--14 years, 22.6 cfs (16,360 acre-ft per year).

Extremes--Maximum discharge during year, 1,720 cfs Aug. 2 (gage height, 5.35 ft), from rating curve extended above 420 cfs; minimum daily, 1.6 cfs Oct. 4.  
1947-61: Maximum discharge, 3,800 cfs July 21, 1954 (gage height, 5.07 ft, site and datum then in use); no flow at times in 1951-52, 1956-60.

Remarks--Records fair. Discharge measurement generally made twice a month. Diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	1.7	1.7	2.5	2.7	1.9	3.4	1.01	5.5	3.4	3.1	2.2
2	2.0	1.8	1.2	2.2	2.4	2.1	2.9	1.01	5.4	4.4	1.47	1.9
3	1.8	1.5	1.1	1.4	2.6	2.3	3.4	1.01	5.2	3.5	1.16	3.9
4	1.6	1.1	1.3	1.4	2.8	2.2	3.9	1.01	5.0	2.7	5.0	3.9
5	2.0	1.2	9.0	1.3	2.2	2.5	5.0	1.01	4.6	2.5	3.6	4.1
6	2.0	1.2	2.5	1.2	2.0	2.4	5.0	1.01	6.2	3.4	2.4	4.1
7	2.0	1.3	b 3.8	1.2	2.0	2.1	5.0	9.5	6.0	2.7	2.0	3.9
8	2.3	1.1	b 4.9	1.1	1.5	1.9	5.4	8.8	4.6	2.7	1.9	3.9
9	2.5	1.3	b 5.0	1.4	2.2	2.1	4.4	8.3	4.4	3.4	2.9	3.8
10	2.5	1.4	b 5.4	1.6	2.3	2.4	5.4	7.5	4.2	2.8	2.4	3.6
11	3.2	1.5	b 6.6	1.4	2.5	2.5	4.8	7.5	3.9	3.6	3.8	3.5
12	3.8	1.8	6.4	1.6	3.1	2.4	5.4	6.5	3.8	3.2	3.1	3.4
13	3.8	1.8	7.0	1.4	2.7	2.3	5.6	9.8	3.6	2.3	2.5	3.2
14	5.1	1.4	7.0	1.4	1.9	2.6	5.2	1.42	3.5	2.1	2.5	3.8
15	5.8	1.4	1.2	2.6	1.5	2.5	4.4	2.10	5.8	2.1	2.5	3.9
16	4.4	1.5	1.2	2.2	1.2	2.3	5.6	2.37	6.7	1.5	2.3	3.8
17	3.8	1.4	1.6	1.7	1.1	2.6	6.2	2.64	5.0	1.9	2.4	3.4
18	2.4	1.4	1.8	2.6	1.4	2.7	6.0	3.28	4.4	2.1	2.7	2.3
19	2.9	1.2	2.0	1.6	1.2	2.6	6.5	3.09	3.9	1.7	2.4	1.9
20	7.0	1.5	2.2	8.4	1.4	2.6	9.5	3.42	4.4	2.1	2.0	4.6
21	5.8	1.4	2.0	8.4	2.0	2.5	1.11	3.02	4.4	2.4	1.6	4.4
22	9.0	1.3	1.9	1.2	2.4	2.5	1.25	2.54	3.4	2.1	1.5	3.8
23	6.4	1.3	2.0	2.2	2.2	3.4	1.29	2.32	2.8	1.7	1.4	4.2
24	5.1	1.2	1.9	2.2	2.2	3.5	1.34	1.89	3.5	1.6	1.4	5.8
25	3.8	1.3	2.0	1.8	2.3	3.1	1.29	1.63	2.9	1.5	1.4	4.6
26	4.4	1.4	1.9	1.4	2.5	2.9	1.29	1.42	2.4	1.4	1.3	3.6
27	3.8	1.4	2.0	1.5	2.0	2.9	1.18	1.21	1.3	1.5	1.3	3.4
28	3.8	1.3	2.7	1.4	1.7	4.1	1.08	9.5	2.8	7.7	1.3	3.4
29	1.3	9.9	1.7	1.4	-	3.2	1.04	8.5	3.4	4.4	9.0	3.1
30	1.9	1.3	2.7	1.4	-	3.2	9.8	7.8	2.8	6.4	1.1	3.1
31	1.6	-----	2.7	1.9	-----	3.1	-----	7.0	-----	5.3	2.6	-----
Total	200.7	413.9	445.6	499.8	580	813	2,215	4,748	1,264	734.5	916.0	1,085
Mean	6.47	13.8	14.4	16.1	20.7	26.2	73.8	153	42.1	23.7	29.5	36.2
Ac-ft	398	821	884	991	1,150	1,610	4,390	9,420	2,510	1,460	1,820	2,150

Calendar year 1960: Max 599 Min - Mean 57.8 Ac-ft 41,970  
Water year 1960-61: Max 342 Min 1.6 Mean 38.1 Ac-ft 27,600

Peak discharge (base, 220 cfs)

b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-20	11:45a.m.	3.91	394	8-2	10:25p.m.	5.35	1,720
7-31	2:35p.m.	4.07	465				

6-7100. South Platte River at Littleton, Colo.

Location.--Lat 39°37'10", long 105°01'10", in NE¼ sec.17, T.5 S., R.68 W., on left bank 200 ft downstream from Hazard Street Bridge at Littleton and 3.1 miles upstream from Bear Creek.

Drainage area.--3,069 sq mi.

Records available.--July 1941 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,304.36 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 23, 1948, wire-weight gage on bridge 200 ft upstream at datum 1.00 ft higher. Nov. 23, 1948, to Sept. 30, 1951, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--20 years, 233 cfs (168,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,670 cfs Aug. 3 (gage height, 5.92 ft); minimum daily, 23 cfs Oct. 1, 9.  
1941-61: Maximum discharge, 9,720 cfs Apr. 23, 1942 (gage height, 8.55 ft, from floodmark, site and datum then in use), from rating curve extended above 4,800 cfs; minimum daily, 7.2 cfs Oct. 2, 1956.

Remarks.--Records good except those for periods of ice effect, which are fair. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, diversions for irrigation and municipal use, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 29 to May 1, Aug. 22 to Sept. 30)

3.0	21	4.2	300
3.2	41	4.6	500
3.5	88	5.0	800
3.8	160	5.3	1,050

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	74	44	b64	51	132	99	154	125	89	512	402
2	34	94	48	b66	46	163	94	223	160	308	856	312
3	33	104	49	b64	46	104	94	304	157	272	972	521
4	33	94	77	b60	46	84	109	340	149	227	476	464
5	36	90	70	b56	41	68	154	316	108	205	344	391
6	37	84	53	b54	39	62	125	312	118	308	412	238
7	37	84	b50	b52	41	74	115	253	154	385	542	260
8	32	84	b52	b50	42	65	115	256	143	396	385	253
9	23	79	b60	53	50	70	102	260	127	380	292	234
10	27	77	b60	57	54	68	113	227	138	367	358	213
11	32	72	70	67	72	72	115	216	132	362	402	193
12	33	72	74	65	92	72	113	253	92	452	354	178
13	38	67	64	57	102	64	118	522	74	367	407	146
14	44	70	62	50	77	67	125	591	79	308	577	143
15	74	77	59	51	100	72	113	542	238	296	752	132
16	59	59	57	59	70	64	115	440	203	292	514	110
17	46	57	64	59	60	62	120	328	160	264	570	122
18	160	53	60	65	56	74	125	349	104	223	728	104
19	193	44	65	62	68	75	149	358	90	181	584	120
20	113	40	68	74	65	72	181	402	120	184	362	412
21	102	33	60	67	70	75	190	556	193	184	316	227
22	120	37	60	64	62	70	193	458	187	223	385	146
23	106	45	65	62	94	74	181	446	163	178	390	172
24	100	44	62	54	64	94	193	320	122	163	316	260
25	92	51	62	48	68	104	268	288	81	190	292	216
26	88	60	59	48	86	100	256	340	96	227	385	227
27	94	54	54	b42	90	100	200	304	149	272	349	213
28	102	45	59	b45	100	106	187	253	94	296	458	184
29	122	44	64	b42	-	98	143	203	83	308	418	181
30	125	42	b60	b45	-----	96	138	184	67	354	446	163
31	104	-----	b66	53	-----	88	-----	157	-----	434	598	-----
Total	2,262	1,930	1,877	1,755	1,852	2,589	4,341	10,155	3,906	8,696	14,852	6,937
Mean	73.0	64.3	60.6	56.6	66.1	83.5	145	328	130	281	479	231
Ac-ft	4,490	3,830	3,720	3,480	3,670	5,140	8,610	20,140	7,750	17,250	29,460	13,760

Calendar year 1960: Max 1,190 Min 16 Mean 205 Ac-ft 149,000  
Water year 1960-61: Max 972 Min 23 Mean 168 Ac-ft 121,300

b Stage-discharge relation affected by ice.

## PLATTE RIVER BASIN

6-7105. Bear Creek at Morrison, Colo.

Location.--Lat 39°39'11", long 105°11'42", in SE 1/4 sec. 35, T.4 S., R.70 W., on right bank 100 ft upstream from bridge on U. S. Highway 285 at Morrison, and a quarter of a mile upstream from Mount Vernon Creek.

Drainage area.--164 sq mi.

Records available.--September 1887 to September 1891, May 1895 to December 1901, February 1902 (gage heights only), October 1919 to September 1961. No winter records for water years 1888-90, 1896, 1898, 1900. Monthly discharge only for some periods, published in WSP 1310. Published as "near Morrison" 1900-1902, as "at Starbuck" 1919-28, and as "at Idledale" 1929-34.

Gage.--Water-stage recorder. Datum of gage is 5,780.43 ft above mean sea level, datum of 1929. Prior to Apr. 1, 1899, staff gage at site a quarter of a mile downstream at different datum. Apr. 1, 1899, to Feb. 28, 1902, staff gage at site a quarter of a mile upstream at different datum. Oct. 1, 1919, to Feb. 28, 1921, staff gage and Mar. 1, 1921, to Sept. 30, 1934, water-stage recorder, at Idledale 4 miles upstream at different datum.

Average discharge.--46 years (1890-91, 1896-97, 1898-99, 1900-1901, 1919-61), 55.0 cfs (39,820 acre-ft per year).

Extremes.--Maximum discharge during year, 252 cfs Aug. 3 (gage height, 4.26 ft); minimum daily, 9.2 cfs Dec. 6. 1887-91, 1895-1901, 1919-61: Maximum discharge, 8,600 cfs (estimated) July 24, 1896; minimum daily, 0.8 cfs Nov. 26, 1939, result of freezeup.

Remarks.--Records poor. Discharge measurements generally made three times a month. Small diversions for irrigation of about 1,000 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 14 to Nov. 29, Feb. 17 to Mar. 30, Apr. 2-27, May 11-15, Sept. 20-30)

Oct. 1 to Nov. 29

Nov. 30 to Sept. 30

3.4	12	2.9	8.0	3.5	48
3.5	17	3.0	11	3.7	82
3.7	35	3.1	15	4.0	150
3.9	64	3.3	28	4.5	335

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	21	16	13	12	b13	23	82	154	66	133	96
2	14	19	16	13	b12	b19	25	75	164	62	130	102
3	14	18	14	14	12	b19	32	86	171	58	210	210
4	14	18	b12	11	12	19	39	83	171	80	140	143
5	14	16	b10	11	b13	18	37	88	164	116	116	132
6	15	16	b92	11	b13	b16	35	80	160	80	111	130
7	15	17	b10	11	b13	b13	32	78	154	62	109	132
8	16	16	b11	11	13	19	32	73	154	69	123	132
9	16	14	b12	11	13	20	29	73	150	80	111	128
10	20	14	b14	11	13	21	35	73	150	59	102	142
11	22		b14	11	15	22	35	88	140	66	100	142
12	22		14	11	16	20	32	98	128	75	109	135
13	22		14	11	b16	19	35	120	120	61	111	130
14	25		13	11	b16	21	33	120	120	56	123	132
15	33		14	11	b16	22	32	130	140	51	111	128
16	29		11	11	b16	24	38	142	123	47	102	130
17	30		13	b11	16	25	38	171	116	45	109	192
18	56		13	b11	16	22	41	185	114	41	123	157
19	50		13	b10	16	21	50	185	109	40	104	145
20	28	a15	12	b10	16	19	66	192	123	41	96	165
21	23		13	b11	13	21	66	210	107	50	94	107
22	21		13	12	19	20	64	196	96	56	90	102
23	19		13	11	18	23	63	202	104	46	86	114
24	19		12	b12	17	27	63	178	100	62	80	111
25	19		13	b11	17	30	61	182	96	66	86	109
26	19		15	b10	19	27	54	192	88	71	86	104
27	21		14	b10	19	24	43	196	80	92	86	100
28	23		b11	b11	b17	22	45	178	78	92	86	96
29	23		b10	b11	-	21	42	174	71	71	77	96
30	19	16	14	b11	-----	20	59	168	64	84	82	94
31	19	-----	13	11	-----	23	-----	154	-----	111	125	-----
Total	694	470	3952	346	429	660	1294	4267	3714	2056	3361	3841
Mean	22.4	15.7	12.8	11.2	15.3	21.3	43.1	138	124	66.3	108	128
Ac-ft	1,380	932	786	686	851	1,310	2,570	8,460	7,370	4,080	6,670	7,620

Calendar year 1960: Max 203 Min 7 Mean 41.6 Ac-ft 30,200  
Water year 1960-61: Max 210 Min 9.2 Mean 59.0 Ac-ft 42,720

Peak discharge (base, 250 cfs).--Aug. 3 (1:30 a.m.) 252 cfs (4.26 ft).

a No gage-height record

b Stage-discharge relation affected by ice.

6-7115. Bear Creek at mouth, at Sheridan, Colo.

Location.--Lat 39°39'08", long 105°01'57", in NW¼NW¼ sec.5, T.5 S., R.68 W., on left bank just downstream from bridge on State Highway 70 at northwest city limits of Sheridan, 1.3 miles upstream from mouth and 2.3 miles west of city hall in Englewood.

Drainage area.--260 sq mi.

Records available.--April to November 1914, March 1927 to September 1961. Monthly discharge only prior to October 1933, published in WSP 1310. Published as "at Sheridan Junction" 1934-41.

Gage.--Water-stage recorder. Altitude of gage is 5,295 ft (from topographic map). Apr. 1 to Nov. 30, 1914, staff gage and Feb. 23, 1927, to June 18, 1931, water-stage recorder, at site 1 mile downstream at different datums. June 19, 1931, to Oct. 8, 1933, water-stage recorder at site 0.8 mile downstream at datum 5,282.72 ft above mean sea level, datum of 1929, prior to June 6, 1949, and at datum 5,280.72 ft thereafter.

Average discharge.--34 years (1927-61), 34.4 cfs (24,900 acre-ft per year).

Extremes.--Maximum discharge during year, 738 cfs June 7 (gage height, 4.93 ft); minimum daily, 6.5 cfs Oct. 10.

1914, 1927-61: Maximum discharge, 3,000 cfs July 7, 1933 (gage height, 6.95 ft, site and datum then in use), from rating curve extended above 1,100 cfs on basis of slope-area measurement of peak flow; maximum gage height, 7.21 ft Sept. 2, 1938 (site and datum then in use); no flow July 13, 1954.

Remarks.--Records good prior to June 29 and fair thereafter except those for period of indefinite stage-discharge relation, which are poor. Storage and diversions above station for irrigation of about 12,000 acres.

Rating table, water year 1960-61, except period of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 17-25, July 9 to Sept. 30)

2.4	6.5	3.3	91
2.6	14	3.6	148
2.8	27	4.0	248
3.0	46	4.5	450

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.3	15	14	12	13	14	14	96	156	e20	113	66
2	9.0	13	14	14	12	15	14	*77	154	e17	123	72
3	9.3	11	14	12	13	17	14	99	163	e13	154	142
4	9.0	12	19	14	13	16	21	95	169	e16	130	128
5	7.9	12	15	12	13	16	52	93	152	e18	104	144
6	7.6	11	15	12	*12	14	*39	89	136	e22	86	*171
7	7.2	10	14	12	12	15	35	88	*139	e15	79	180
8	7.2	13	15	12	13	14	36	89	124	e16	82	178
9	7.6	*13	15	16	14	*13	34	79	117	21	70	174
10	6.5	18	16	12	*15	19	40	72	117	16	62	165
11	7.2	18	17	12	14	19	42	76	111	*16	58	156
12	7.2	17	16	12	15	17	38	76	107	21	66	148
13	9.6	15	*17	*12	15	15	38	105	100	18	70	138
14	14	15	15	12	15	13	38	134	95	18	98	134
15	12	15	18	12	15	13	33	*178	*105	15	100	130
16	14	15	14	12	15	13	33	197	96	14	88	122
17	14	15	14	12	15	14	34	*258	82	12	86	122
18	5.8	15	14	12	14	13	35	287	74	10	102	118
19	5.4	15	15	*14	13	22	*44	272	62	3.6	79	128
20	*31	15	15	13	13	*21	66	287	72	10	74	150
21	28	15	15	12	13	14	82	344	*60	15	62	*123
22	25	14	16	12	13	13	79	283	46	15	54	128
23	21	14	15	14	14	13	83	290	44	13	47	150
24	15	15	15	12	*12	14	82	248	43	13	37	169
25	12	16	15	12	14	13	84	*239	35	*14	*37	146
26	10	14	14	12	15	12	86	221	33	13	39	144
27	10	15	14	12	14	12	74	210	26	13	38	134
28	11	15	14	13	14	16	66	187	20	17	55	130
29	11	14	14	14	-	13	64	178	e16	19	49	124
30	15	*15	14	13	-----	13	84	174	e14	19	47	120
31	17	-----	13	13	-----	15	-----	*153	-----	50	79	-----
Total	476.6	435	465	390	383	471	1,489	5,279	2,563	517.6	2,373	4,139
Mean	15.4	14.5	15.0	12.6	13.7	15.2	49.6	170	88.9	16.7	76.7	138
Ac-ft	945	863	922	774	760	934	2,950	10,470	5,290	1,030	4,720	8,210

Calendar year 1960: Max 245 Min 3.6 Mean 40.3 Ac-ft 29,260  
Water year 1960-61: Max 344 Min 6.5 Mean 52.3 Ac-ft 37,870

\* Discharge measurement made on this day.

e Stage-discharge relation indefinite.



6-7120. Cherry Creek near Franktown, Colo.

Location.--Lat 39°21'30", long 104°45'50", in NE¼ sec.15, T.8 S., R.66 W., on right bank 1¼ miles upstream from Russellville Gulch and 2¼ miles south of Franktown.

Drainage area.--169 sq mi.

Records available.--November 1939 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,150 ft (from topographic map). Prior to Oct. 1, 1953, at site 1,000 ft downstream, at datum 6,149.53 ft above mean sea level (unadjusted) prior to Apr. 13, 1942, and at datum 6,147.53 ft above mean sea level Apr. 13, 1942, to Sept. 30, 1953.

Average discharge.--21 years (1940-61), 10.1 cfs (7,310 acre-ft per year).

Extremes.--Maximum discharge during year, 3,410 cfs July 31 (gage height, 8.84 ft), from rating curve extended above 770 cfs on basis of slope-area measurement of peak flow; minimum daily, 1.0 cfs Oct. 8.

1939-61: Maximum discharge, 9,170 Aug. 5, 1945 (gage height, 4.91 ft, site and datum then in use), by float measurement; minimum daily, 0.2 cfs July 13, 1946, Sept. 30, Oct. 1, 1950.

Highest flood known occurred Aug. 3, 1933, when Castlewood Dam failed.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Many small diversions above station for irrigation of about 800 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Aug. 2, 11-14, 19-29)

1.6	0.6	2.7	9.5	4.0	150
1.9	1.6	3.0	17	4.5	255
2.2	3.4	3.3	39	5.0	400
2.5	5.8	3.6	75		

Discharge, in cubic feet per second, water year, October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	4.3	3.9	4.6	4.0	9.3	14	5.3	4.1	2.3	4.2	1.6
2	1.1	3.9	4.7	b 4.0	3.9	22	14	5.4	5.2	1.9	1.5	7.1
3	1.1	3.5	6.1	b 3.8	4.7	3.8	12	5.3	2.7	1.8	3.8	1.8
4	1.1	3.6	4.2	3.5	4.8	2.4	12	5.9	2.0	1.5	5.4	1.5
5	1.1	3.6	2.1	3.3	4.3	1.6	14	6.1	1.3	1.7	3.6	2.0
6	1.1	3.8	3.3	3.3	4.1	1.2	14	5.9	1.3	2.0	2.8	1.6
7	1.1	4.0	3.1	3.0	b 4.3	1.5	14	6.5	1.7	2.7	2.3	9.3
8	1.0	3.8	4.2	3.2	b 4.7	8.1	9.0	8.4	1.2	9.5	2.1	5.1
9	1.2	3.1	4.0	3.3	b 4.9	1.4	7.2	5.8	1.0	4.7	2.1	4.6
10	1.2	3.5	4.8	3.6	b 5.3	2.4	2.6	4.6	9.5	3.3	4.9	4.2
11	1.2	4.7	4.8	3.1	5.6	3.2	3.2	4.2	1.1	3.0	7.7	4.0
12	1.2	5.8	b 4.4	3.3	7.7	2.6	1.6	3.5	6.4	1.1	5.7	4.2
13	1.3	5.7	b 4.1	3.3	1.2	1.4	2.0	6.8	5.6	5.8	1.4	3.9
14	1.4	5.1	b 4.5	3.3	1.4	1.8	1.6	3.8	1.1	5.1	6.9	4.0
15	2.2	4.3	4.8	4.0	2.3	2.0	1.0	8.1	2.1	4.6	5.6	4.1
16	1.8	3.5	b 3.6	3.9	3.4	1.7	1.3	6.3	1.4	4.4	4.4	3.7
17	1.7	3.5	b 4.1	3.9	1.8	1.8	1.2	3.3	8.6	3.2	4.1	3.0
18	1.4	3.9	4.2	4.2	1.0	1.6	1.1	2.0	5.1	2.5	1.8	2.9
19	1.2	4.7	4.3	4.1	9.5	1.8	1.0	1.4	4.6	2.2	7.4	2.9
20	5.7	4.4	4.1	b 3.9	9.0	2.2	9.3	1.1	6.2	2.2	4.7	5.3
21	4.7	4.3	3.9	b 3.8	1.1	2.7	8.8	1.2	4.6	3.6	3.8	6.9
22	4.2	4.2	4.2	3.9	1.4	1.8	8.4	8.6	3.4	3.2	3.3	5.2
23	4.2	3.5	4.7	4.0	9.5	2.0	7.2	9.5	3.1	2.5	3.0	1.2
24	4.2	4.0	4.5	4.1	1.0	1.7	7.9	8.1	2.8	2.0	2.6	4.7
25	3.7	5.2	4.7	3.5	1.4	1.6	1.4	7.9	2.6	2.0	2.5	2.4
26	3.3	5.0	4.4	4.4	1.7	1.3	1.5	9.0	2.4	3.8	2.8	1.3
27	3.1	4.7	4.5	4.0	1.0	1.2	1.0	7.9	2.2	5.8	2.8	3.8
28	3.5	3.3	4.4	b 3.9	9.0	1.3	6.8	6.8	2.2	3.1	2.8	7.2
29	4.2	2.6	b 3.8	4.0	-	1.2	5.6	5.4	2	5.1	2.6	6.5
30	4.2	3.7	b 4.8	3.9	-----	1.3	5.1	5.2	2.3	2.9	4.0	6.1
31	4.5	-----	5.0	3.8	-----	1.4	-----	4.3	-----	3.59	2.0	-----
Total	97.4	124.2	132.2	115.9	282.3	558.4	374.1	419.4	251.9	495.4	261.6	291.0
Mean	3.14	4.14	4.26	3.74	10.1	18.0	12.5	13.5	8.40	16.0	8.44	9.70
Ac-ft	193	246	262	230	560	1,110	742	832	500	983	519	577

Calendar year 1960: Max 1,190 Min 0.7 Mean 21.3 Ac-ft 15,440

Water year 1960-61: Max 359 Min 1.0 Mean 9.33 Ac-ft 6,750

Peak discharge (base, 200 cfs)

b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-11	4:15p.m.	4.25	200	8-10	3:20p.m.	5.94	750
7-31	4p.m.	8.84	3,410				

## PLATTE RIVER BASIN

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6-7125. Cherry Creek near Melvin, Colo.

Note.--Records for the 1961 water year have been withheld pending better definition of the stage-discharge relation for high stage. They will be published in a subsequent annual report.

6-7130. Cherry Creek below Cherry Creek Reservoir, Colo.

Location.--Lat 39°39'10", long 104°51'40", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.35, T.4 S., R.67 W., on right bank 2,000 ft downstream from Cherry Creek Dam, 2 miles southeast of Sullivan, 9 miles southeast of Civic Center in Denver, and 11 miles upstream from mouth.

Drainage area.--385 sq mi.

Records available.--June 1950 to September 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 5,490.51 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--11 years, 3.13 cfs (2,270 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 508 cfs Aug. 7 (gage height, 5.38 ft); no flow most of year.

1951-61: Maximum discharge, 1,440 cfs July 31, 1956 (gage height, 6.07 ft); no flow for many days in 1957-61.

Maximum flood known, 34,000 cfs Aug. 3, 1933, by slope-area measurement near present site (Castlewood Dam failure).

Remarks.--Records good. Flow regulated by Cherry Creek Reservoir (capacity, 247,500 acre-ft). Reservoir was completed in June 1950. Permanent storage started May 15, 1957. Contents Sept. 30, 1961, 15,060 acre-ft. Change in contents during water year 1961, +1,460 acre-ft. Diversions above station for irrigation of about 1,800 acres.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-20, July 19 to Aug. 1)

2.9	0	3.5	8.0	4.5	92
3.1	1.3	3.7	14	4.8	180
3.2	2.3	4.0	29	5.2	370
3.3	3.8	4.3	58		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1			0	0	0.1		*0		0	0	0.2
2	.1			0	.1	.1		0	(*)	0	0	.2
3	.1		(*)	0	.1	.1		0		0	0	.3
4	.1			0	0	.1		0		0	0	.2
5	0			0	0	.1		0		*0	0	.2
6	0			0	0	.1	(*)	0		0	0	.1
7	0	(*)		0	*0	.1		0		0	*3.23	.1
8	0			*0	0	0		0		0	1.26	*.2
9	0			0	0	0		0		0	**2	.2
10	0			0	0	0		0		0	.1	.2
11	0			0	0	0		0		0	.2	.2
12	0			0	.1	0		0		0	.2	.2
13	0			0	0	0		0		0	.1	.2
14	0			0	0	0		0		0	.1	.2
15	**1			0	0	0		0		0	.2	.2
16	0			0	0	0		0		0	.2	.1
17	0	(*)		0	0	0		0		0	.3	.1
18	.3			0	0	0		0		*0	*.2	*.1
19	.1			0	.1	0		0	(*)	0	.2	.2
20	0			0	.1	0		.1		.1	.2	.2
21	0			0	.1	0		.1		.2	.3	.2
22	0			0	.1	0		0		.2	.3	.2
23	0			0	.1	0		0		.1	.2	.2
24	0			0	.1	0		0		.1	.2	.3
25	0			0	.1	0		0		.1	.3	.2
26	0			*0	.1	0		0		.2	.3	.2
27	0			.1	.1	0		0		.2	.3	.2
28	0			.2	.1	0		0		.2	.3	.2
29	0			.1	-	0		0		.1	.2	.2
30	0			0	-----	0		0		.2	.3	.2
31	0	-----		0	-----	0	-----	0	-----	.2	.2	-----
Total	0.9	0	0	0.4	1.3	0.7	0	0.2	0	1.9	459.1	5.7
Mean	0.03	0	0	0.01	0.05	0.02	0	0.006	0	0.06	14.8	0.19
Ac-ft	1.8	0	0	0.8	2.6	1.4	0	0.4	0	3.8	911	11

Calendar year 1960: Max 525 Min 0 Mean 11.0 Ac-ft 7,990  
Water year 1960-61: Max 328 Min 0 Mean 1.29 Ac-ft 933

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Nov. 17 to Jan. 25.

## PLATTE RIVER BASIN

6-7135. Cherry Creek at Denver, Colo.

Location.--Lat 39°44'58", long 105°00'08", in NE¼ sec.33, T.3 S., R.68 W., on right bank on downstream side of Wazee Street Bridge in Denver, 0.5 mile upstream from mouth.

Drainage area.--409 sq mi.

Records available.--August 1942 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,176.34 ft above mean sea level, datum of 1929. Prior to Jan. 23, 1945, wire-weight gage at Broadway Bridge 1.8 miles upstream at datum 57.29 ft higher. Jan. 23 to Feb. 26, 1945, wire-weight gage at Downing Street Bridge 2.8 miles upstream from present site at different datum. Feb. 27, 1945, to Sept. 30, 1947, wire-weight gages at Washington Street Bridge 2.4 miles upstream from present site at datum 72.31 ft higher and Oct. 1, 1947, to Sept. 30, 1949, as datum 71.31 ft higher than present datum. Oct. 1, 1949, to July 15, 1951, wire-weight gage at Market Street Bridge 0.1 mile upstream from present site at datum 8.49 ft higher.

Average discharge.--19 years, 16.6 cfs (12,020 acre-ft per year).

Extremes.--Maximum discharge during year, 1,400 cfs July 31 (gage height, 6.08 ft); minimum daily, 3.3 cfs Apr. 9.

1942-61: Maximum discharge observed, 3,120 cfs Aug. 5, 1945 (gage height, 5.25 ft, site and datum then in use); minimum daily, 0.4 cfs June 16-18, 1948.

Flood of July 26, 1885, reached a discharge of 20,000 cfs, by float measurement. Flood of May 19, 20, 1864, reached a somewhat higher stage. Flood of Aug. 3, 1933, reached a discharge of about 15,000 cfs, as determined by rise of South Platte River at Denver.

Remarks.--Records good except those for periods of ice effect, which are poor. Several diversions above station for irrigation of about 1,900 acres. Flood flow regulated by Cherry Creek Reservoir 11 miles upstream (capacity, 247,500 acre-ft).

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.2	3.3	3.8	67
3.3	8.3	4.1	137
3.4	16	4.4	236
3.6	36		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	13	5.9	5.3	4.8	5.4	3.6	7.0	7.6	5.5	1.8	1.4
2	5.9	12	5.9	4.5	4.8	17	3.6	5.3	12	11	*3.9	51
3	*8.3	7.6	*5.9	b4.2	4.8	18	4.0	9.0	16	5.3	6.4	7.9
4	7.6	6.4	27	b4.4	4.8	16	5.3	*7.0	25	7.0	5.3	3.7
5	7.0	5.9	7.0	b4.6	7.0	12	5.3	15	24	*10	4.4	*12
6	8.3	5.3	6.4	b4.8	4.8	6.4	*4.0	9.7	*11	7.0	5.9	9.7
7	7.6	*5.9	7.0	5.3	4.8	5.3	4.0	9.7	12	6.4	21.6	9.0
8	9.0	7.0	5.9	5.3	*4.8	*5.3	5.3	7.0	27	9.7	*23.5	12
9	12	11	7.0	5.9	4.4	4.8	3.3	9.7	20	5.9	12	9.0
10	5.3	7.6	7.6	*5.3	4.8	5.3	10	5.9	17	9.0	10	13
11	5.3	6.4	9.0	4.8	4.8	5.3	5.3	7.0	9.7	14	9.7	15
12	5.9	6.4	7.0	5.9	4.8	4.4	4.4	16	11	6.4	9.7	16
13	10	5.9	6.4	5.3	5.3	4.8	4.0	100	10	6.4	9.0	14
14	3.4	5.9	6.4	5.9	4.8	4.8	3.6	3.6	18	9.7	7.0	9.7
15	*16	5.9	5.9	5.3	4.8	4.8	4.0	11	15	8.3	36	20
16	4.8	5.9	5.3	5.3	5.3	4.8	3.6	8.2	11	5.9	7.0	19
17	5.9	5.9	5.9	5.3	5.3	11	4.0	5.9	11	6.4	*18	11
18	11.6	5.9	5.9	5.3	4.8	30	4.4	6.4	11	*6.4	11	*11
19	14	*5.3	7.0	4.8	7.6	9.7	4.8	4.8	*14	6.4	10	7.7
20	7.0	5.3	5.9	4.8	5.3	5.9	4.4	17	11	9.7	14	7.9
21	8.3	5.3	5.3	5.3	5.3	5.3	*5.3	17	9.0	33	16	29
22	13	5.3	7.0	4.8	5.3	12	5.3	7.0	7.6	9.7	7.6	10
23	12	5.3	6.4	4.8	9.7	12	4.8	11	7.6	8.3	7.0	33
24	11	5.3	5.9	5.3	5.3	12	23	9.0	8.3	7.0	7.0	52
25	12	5.9	5.3	4.8	5.3	*14	15	55	7.0	7.0	9.0	52
26	13	5.9	5.3	*4.8	8.3	4.4	9.0	9.0	9.0	8.3	9.7	23
27	14	7.0	5.9	7.0	*7.6	9.6	4.0	10	7.6	5.9	9.7	14
28	14	5.9	5.3	5.3	6.4	24	4.8	11	7.0	18	9.0	9.7
29	14	5.9	5.9	5.9	-	8.3	4.4	15	7.6	5.3	6.4	9.0
30	7.0	5.9	7.6	5.3	-----	5.3	4.8	9.7	7.6	6.7	23	16
31	10	-----	5.9	4.8	-----	4.0	-----	7.6	-----	9.1	13	-----
Total	424.6	198.2	216.1	160.4	155.8	292.9	172.3	453.9	371.6	466.4	800.8	765.1
Mean	13.7	6.61	6.97	5.17	5.56	9.45	5.74	14.8	12.4	15.0	25.8	25.5
Ac-ft	842	393	429	318	309	581	342	910	737	925	1,590	1,520

Calendar year 1960: Max 476 Min 3.2 Mean 17.9 Ac-ft 13,000  
 Water year 1960-61: Max 235 Min 3.3 Mean 12.3 Ac-ft 8,900

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

6-7140. South Platte River at Denver, Colo.

Location.--Lat 39°45'35", long 105°00'10", in NW¼SE¼ sec.28, T.3 S., R.68 W., on right bank 20 ft upstream from Nineteenth Street Bridge in Denver and 0.4 mile downstream from Cherry Creek.

Drainage area.--5,804 sq mi.

Records available.--May to October 1889, June to October 1890, July 1895 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder. Datum of gage is 5,162.12 ft above mean sea level, datum of 1929. Prior to Aug. 12, 1909, staff gages and Aug. 12, 1909, to Aug. 28, 1931, water-stage recorder, at several sites within half a mile of present site at approximately present datum.

Average discharge.--66 years, 345 cfs (249,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,200 cfs July 31 (gage height, 2.66 ft); minimum daily, 31 cfs Oct. 2. 1889-90, 1895-1961: Maximum discharge, 22,000 cfs Sept. 10, 1933 (gage height, 10.98 ft), from rating curve extended above 8,800 cfs on basis of float-area measurement at gage height 9.44 ft; minimum daily, 8.8 cfs Mar. 25, 1951.

Remarks.--Records good. Discharge measurements generally made two or more times a month. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation of about 79,000 acres and municipal use, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-18, Nov. 3-10, Mar. 1-5, Sept. 24-30)

0.4	22	1.0	310
.5	44	1.5	790
.6	75	2.0	1,310
.8	168		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	126	83	87	96	158	96	232	346	132	730	640
2	31	132	91	75	83	206	87	302	355	382	940	650
3	53	132	83	79	87	168	87	373	373	355	1,090	1,010
4	42	112	181	72	83	158	100	418	382	310	600	740
5	37	112	126	72	91	132	181	445	337	279	500	600
6	37	112	72	72	79	96	174	436	319	391	540	490
7	44	112	66	72	75	100	147	382	400	463	800	510
8	53	116	75	79	75	87	152	355	427	472	750	490
9	35	132	79	87	83	87	126	346	319	481	463	454
10	35	116	112	79	91	96	152	319	310	463	454	427
11	60	112	121	79	96	87	168	310	302	463	540	391
12	79	108	121	91	126	108	158	337	271	570	463	373
13	79	108	108	83	174	96	163	980	226	481	520	346
14	163	108	91	75	137	96	174	920	232	427	630	328
15	187	112	104	75	158	100	158	730	364	400	860	328
16	121	100	83	87	142	96	163	690	346	373	690	302
17	87	96	87	96	132	108	168	620	232	346	700	302
18	632	100	104	100	116	248	168	650	240	328	800	294
19	346	91	116	96	112	158	174	660	200	279	690	520
20	194	87	126	83	104	126	213	700	206	279	530	760
21	163	83	121	83	108	116	248	940	255	346	445	600
22	174	83	112	91	91	116	240	710	240	255	490	445
23	158	91	112	91	126	104	213	660	226	219	481	560
24	158	83	112	91	112	96	302	530	219	174	409	770
25	152	108	108	83	100	108	364	540	147	187	364	580
26	152	83	104	66	121	96	355	445	132	219	445	520
27	152	104	96	44	126	100	271	409	194	255	436	510
28	158	96	91	56	116	206	255	445	132	310	520	454
29	163	87	79	66	-	121	213	427	100	294	550	463
30	158	87	100	75	-----	100	206	400	75	409	590	436
31	152	-----	100	87	-----	100	-----	364	-----	570	730	-----
Total	4,095	3,129	3,164	2,472	3,040	3,774	5,676	16,075	7,907	10,912	18,750	15,293
Mean	132	104	102	79.7	109	122	189	519	264	352	605	510
Ac-ft	8,120	6,210	6,280	4,900	6,030	7,490	11,260	31,880	15,680	21,640	37,190	30,330

Calendar year 1960: Max 1,650 Min 31 Mean 274 Ac-ft 199,000  
Water year 1960-61: Max 1,090 Min 31 Mean 258 Ac-ft 187,000



## PLATTE RIVER BASIN

6-7165. Clear Creek near Lawson, Colo.

Location.--Lat 39°45'40", long 105°39'06", in SE 1/4 sec. 27, T.3 S., R.74 W., on right bank 500 ft south of U. S. Highway 6 and 40, 0.4 mile downstream from West Fork Clear Creek, and 1 mile west of Lawson.

Drainage area.--145 sq mi.

Records available.--March 1946 to September 1961. Records prior to 1959 include inflow from Jones Pass tunnel.

Gage.--Water-stage recorder. Datum of gage is 8,193.72 ft above mean sea level (State Highway Department bench mark).

Average discharge.--15 years, 141 cfs (102,100 acre-ft per year), adjusted for inflow from Jones Pass tunnel prior to 1959.

Extremes.--Maximum discharge during year, 718 cfs June 20 (gage height, 4.72 ft); minimum daily, 19 cfs Nov. 29, Feb. 5.  
1946-61: Maximum discharge, 6,130 cfs June 4, 1956 (gage height, 7.41 ft), from rating curve extended above 1,600 cfs on basis of computation of peak flow over dam, caused by failure of Georgetown Dam on White Reservoir about 5 miles upstream; minimum daily, 13 cfs Feb. 20, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Natural flow affected by minor transmountain diversion from Colorado River basin through Berthoud Pass ditch (see elsewhere in this report). No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 3-9)

2.2	19	3.0	118
2.3	24	3.5	245
2.5	42	4.0	415
2.7	65	4.5	630

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	37	25	22	22	21	25	49	490	429	a 320	116
2	43	34	25	22	22	23	26	63	500	415	a 310	114
3	42	35	25	22	21	22	27	72	422	404	a 250	138
4	41	34	26	* 24	20	22	29	80	387	422	* 234	129
5	41	34	25	24	19	22	26	71	362	* 422	214	159
6	40	32	25	25	* 20	23	26	59	359	390	204	174
7	38	34	24	25	20	20	* 25	* 55	384	387	198	185
8	38	32	25	24	21	21	26	53	472	370	193	* 195
9	40	28	26	24	22	23	26	52	580	348	185	212
10	41	36	23	25	22	23	26	71	603	314	167	217
11	42	33	23	25	23	23	25	100	* 594	300	169	214
12	40	31	* 28	25	22	22	26	122	621	275	172	214
13	40	31	28	25	22	24	26	142	585	254	185	214
14	43	31	27	25	24	24	26	102	554	* 248	206	206
15	43	28	26	25	23	24	24	96	549	239	174	201
16	43	28	26	24	23	24	24	93	558	231	180	201
17	45	29	26	22	22	24	24	93	567	220	228	201
18	46	30	26	22	21	23	27	100	* 562	206	180	193
19	43	30	26	23	20	23	31	135	572	177	159	204
20	43	30	26	23	21	23	36	174	626	195	152	228
21	40	28	27	24	21	22	34	182	608	214	150	228
22	39	28	28	24	21	24	32	214	580	198	138	223
23	39	31	27	24	22	25	35	263	558	169	125	220
24	39	30	25	23	22	26	35	245	549	162	127	212
25	39	29	23	23	21	25	33	* 257	518	154	147	193
26	* 37	29	22	22	22	24	29	266	500	159	136	195
27	39	28	21	21	21	* 24	30	314	482	152	129	195
28	37	24	20	21	20	23	30	366	468	162	127	204
29	37	19	23	21	-	23	34	394	440	177	116	209
30	29	22	22	22	-----	24	40	443	429	204	140	187
31	43	-----	22	22	-----	24	-----	464	-----	a 240	142	-----
Total	1,254	905	781	723	600	713	863	3,190	15,479	8,237	5,562	5,781
Mean	40.5	30.2	25.2	23.3	21.4	23.2	28.8	167	516	266	179	193
Ac-ft	2,490	1,800	1,550	1,430	1,190	1,420	1,710	10,290	30,700	16,340	11,030	11,470

Calendar year 1960: Max 884 Min 18 Mean 128 Ac-ft 93,060  
Water year 1960-61: Max 626 Min 19 Mean 126 Ac-ft 91,420

Peak discharge (base, 600 cfs).--June 11 (9:30 p.m.) 712 cfs (4.65 ft); June 20 (7 p.m.) 718 cfs (4.72 ft).

\* Discharge measurement made on this day.

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 16-18, Nov. 29 to Dec. 3, Dec. 5 to Jan. 8, Jan. 11, 13, 14, 16-24, 26-31, Feb. 2-8, 18-22, 24, 25, Feb. 27 to Mar. 1, Mar. 4, 8, 9.

6-7195. Clear Creek near Golden, Colo.

Location.--Lat 39°45'05", long 105°14'55", in NE $\frac{1}{4}$  sec.32, T.3 S., R.70 W., on left bank half a mile downstream from Golden Canal diversion and 1 mile west of Golden.

Drainage area.--399 sq mi.

Records available.--October 1908 to December 1909, June 1911 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Records for 1940-58 include inflow from Jones Pass tunnel.

Gage.--Water-stage recorder. Datum of gage is 5,735.27 ft above mean sea level (State Highway bench mark). Prior to May 15, 1919, at site half a mile upstream at different datum. May 15, 1919, to Mar. 16, 1934, at present site at datum 3.13 ft higher. Mar. 17, 1934, to Aug. 29, 1941, at present site at datum 4.00 ft higher. Aug. 30, 1941, to Apr. 16, 1942, at present site at datum 2.00 ft higher. Apr. 17, 1942, to Jan. 20, 1943, at site 600 ft downstream at datum 7.50 ft lower.

Average discharge.--51 years, 233 cfs (168,700 acre-ft per year), adjusted for inflow from Jones Pass tunnel and Berthoud Pass ditch 1940-58.

Extremes.--Maximum discharge during year, 1,230 cfs July 27 (gage height, 4.81 ft); maximum gage height, 5.55 ft Jan. 6 (backwater from ice); minimum daily discharge, 30 cfs Feb. 5.

1908-9, 1911-61: Maximum discharge, 5,890 cfs Sept. 9, 1933 (gage height, 11.57 ft, present datum, from floodmarks), from rating curve extended above 2,200 cfs on basis of slope-area measurement of peak flow; minimum daily recorded, 11 cfs Mar. 13, 1954. Maximum discharge known, 8,700 cfs Aug. 1, 1888, from reports of State engineer of Colorado for station 5 $\frac{1}{2}$  miles upstream.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Natural flow affected by minor transmountain diversion from Colorado River basin through Berthoud Pass ditch (see elsewhere in this report), small diversions for irrigation of about 3,000 acres above station, and several small reservoirs above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	29	4.0	490
2.6	60	4.5	870
2.9	118	5.0	1,440
3.5	290		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	76	45	36	34	33	43	113	*798	573	550	256
2	84	70	52	36	33	34	54	130	940	538	514	246
3	82	68	44	36	32	37	61	*166	852	508	502	297
4	82	66	38	37	31	37	71	166	764	485	384	283
5	78	63	36	39	30	35	63	168	732	557	339	294
6	76	60	35	40	*31	34	*57	146	748	490	308	325
7	73	65	36	40	32	34	51	140	740	470	304	322
8	71	62	37	40	33	34	56	138	825	480	*325	328
9	74	*55	39	40	34	*38	46	130	970	440	294	342
10	82	57	41	41	*36	37	46	166	1,010	404	266	346
11	80	70	39	42	37	38	55	213	981	400	253	339
12	80	66	39	43	36	38	50	276	970	380	259	325
13	76	62	*38	43	36	38	56	322	950	346	300	322
14	86	60	37	42	36	41	55	273	*900	328	339	318
15	90	57	36	46	36	41	50	253	880	314	280	*304
16	88	44	36	*39	36	40	55	256	880	304	266	297
17	90	47	36	38	36	40	55	270	920	290	353	311
18	111	60	36	36	32	39	57	*280	920	270	318	294
19	98	59	37	36	32	35	70	328	900	259	283	325
20	92	55	38	37	32	*36	92	400	960	273	266	392
21	*78	57	38	37	*33	35	86	408	920	311	263	368
22	66	56	40	39	35	38	82	432	900	308	263	364
23	65	60	41	40	35	42	90	485	852	259	253	368
24	66	68	43	*36	35	43	92	470	816	243	246	364
25	62	62	42	34	36	43	88	*465	772	240	263	328
26	62	57	38	32	35	41	80	465	724	253	263	328
27	71	57	36	31	34	40	73	526	675	304	253	325
28	74	45	34	32	33	39	78	592	660	270	263	322
29	76	31	33	32	-	38	80	613	*506	276	250	*339
30	57	*41	38	33	-----	41	94	684	592	325	253	322
31	63	-----	36	34	-----	45	-----	732	-----	384	287	-----
Total	2,419	1,756	1,194	1,167	950	1,184	1,995	10,211	25,153	11,287	9,560	9,694
Mean	78.0	58.5	38.5	37.6	33.9	38.2	66.5	329	839	364	308	323
Ac-ft	4,800	3,480	2,370	2,310	1,880	2,350	3,960	20,250	49,900	22,390	18,960	19,230

Calendar year 1960: Max 1,340 Min 31 Mean 229 Ac-ft 166,300  
 Water year 1960-61: Max 1,010 Min 30 Mean 210 Ac-ft 151,900

Peak discharge (base, 1,100 cfs).--June 10 (2 a.m.) 1,110 cfs (4.73 ft); July 27 (5 p.m.) 1,230 cfs (4.81 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 30 to Apr. 3 (no gage-height record Dec. 6-8, 11, 12, Jan. 8-12, 26, Mar. 31 to Apr. 3).

## PLATTE RIVER BASIN

32

6-7200. Clear Creek at mouth, near Derby, Colo.

Location (revised).--Lat 39°49'42", long 104°57'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.36, T.2 S., R.68 W., on right bank 160 ft downstream from bridge on highway to Welby, 0.6 mile upstream from mouth and 2 $\frac{1}{2}$  miles west of Derby.

Drainage area.--575 sq mi.

Records available.--April to November 1914, March 1927 to September 1961. Prior to October 1933 monthly discharge only, published in WSP 1310.

Gage.--Water-stage recorder. Altitude of gage is 5,110 ft (from topographic map). Apr. 1 to Nov. 30, 1914, chain gage at bridge 160 ft upstream at different datum. Feb. 25, 1927, to June 7, 1942, water-stage recorder at several sites within 1,000 ft of present site at various datums. June 8, 1942, to May 30, 1948, water-stage recorder at site 160 ft upstream at datum 4.00 ft higher, May 31, 1948, to Aug. 27, 1956, at datum 2.00 ft higher, and Aug. 28, 1956, to Nov. 14, 1957, at datum 1.00 ft higher. Nov. 15, 1957, to July 15, 1958, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--34 years (1927-61), 89.4 cfs (64,720 acre-ft per year).

Extremes.--Maximum discharge during year, 1,020 cfs June 10 (gage height, 4.10 ft); minimum daily, 8.0 cfs Oct. 1-3, 5-9. 1914, 1927-61: Maximum discharge, 3,650 cfs Sept. 3, 1938 (gage height, 4.04 ft, site and datum then in use), from rating curve extended above 1,300 cfs; minimum daily, 0.4 cfs Mar. 11, 1943.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain diversions (see elsewhere in this report), storage reservoirs, diversions for irrigation of about 77,000 acres above station, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	29	23	23	23	22	23	16	482	350	402	43
2	8	23	30	29	23	22	25	20	750	395	112	127
3	8.0	24	32	31	30	26	21	38	820	234	234	638
4	8.5	23	29	32	29	32	20	45	840	168	33	360
5	8.0	26	26	34	29	28	20	53	730	194	23	185
6	8	27	20	35	30	28	19	33	646	217	22	150
7	8	30	24	35	32	33	24	19	626	214	23	74
8	8	26	30	36	32	29	24	13	770	152	69	64
9	8	23	40	37	30	23	36	17	860	174	41	79
10	9	24	42	33	27	26	44	16	900	59	38	77
11	11	27	38	35	23	24	49	32	810	29	44	68
12	12	23	30	37	27	23	38	92	785	62	53	62
13	14	23	30	34	25	32	25	466	642	37	107	53
14	12	29	30	35	24	33	47	301	630	38	238	55
15	13	30	31	37	24	34	33	66	810	38	87	61
16	15	23	30	36	24	32	32	29	755	43	30	79
17	18	32	29	32	23	27	36	15	653	48	38	108
18	29	32	33	27	23	49	30	20	662	40	75	93
19	23	29	35	33	24	37	25	64	586	40	28	144
20	36	23	33	35	26	35	15	132	614	45	17	426
21	29	29	32	37	24	36	10	350	570	86	14	244
22	26	27	35	39	26	23	12	141	454	224	24	227
23	23	27	36	35	29	25	12	44	300	110	15	280
24	22	29	37	27	24	24	17	44	311	62	16	423
25	20	32	35	24	22	24	32	85	300	31	20	350
26	21	23	32	22	26	25	14	185	297	21	32	360
27	23	24	29	41	23	25	10	162	350	34	36	346
28	24	23	26	41	27	49	9.5	186	402	69	40	314
29	22	22	25	35	-	30	11	273	356	40	26	325
30	21	24	29	35	-----	34	13	404	332	57	32	342
31	25	-----	29	31	-----	29	-----	388	-----	177	110	-----
Total	584.5	816	964	1,038	749	934	729.5	3,759	18,048	3,493	2,079	6,162
Mean	18.9	27.2	31.1	33.5	26.8	30.1	24.3	121	602	113	67.1	205
Ac-ft	1,160	1,620	1,910	2,060	1,490	1,850	1,450	7,460	35,800	6,930	4,120	12,220

Calendar year 1960: Max 724 Min - Mean 95.4 Ac-ft 69,250  
 Water year 1960-61: Max 900 Min 8.0 Mean 108 Ac-ft 78,070

Note.--No gage-height record Oct. 1, 2, 6-12, 16, 17, 22-31, Nov. 2-16, Nov. 18 to Dec. 8, Dec. 13-21, Dec. 23 to Jan. 5, Jan. 7-16, 20-24, 28-31, Feb. 2-5, 7-9, 12-14, 17-19 (stage-discharge relation affected by ice during parts of periods).

## PLATTE RIVER BASIN

33

6-7205. South Platte River at Henderson, Colo.

Location--Lat 39°55'12", long 104°52'18", in NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 34, T.1 S., R.67 W., on left bank 1,200 ft upstream from bridge on State Highway 22 and 0.3 mile west of Henderson.

Drainage area--4,713 sq mi.

Records available--May 1926 to September 1961. Prior to October 1933, monthly discharge only, published in WSP 1310.

Gage--Water-stage recorder. Datum of gage is 5,005.12 ft above mean sea level, datum of 1929. Prior to Apr. 17, 1956, at site 1,240 ft downstream. May 1, 1926, to Apr. 19, 1942, at datum 3.00 ft higher, Apr. 20, 1942, to Sept. 30, 1953, at datum 1.00 ft higher, and Oct. 1, 1953, to Apr. 16, 1956, at present datum. Apr. 17, 1956, to May 31, 1960, at site 840 ft downstream at present datum.

Average discharge--35 years, 325 cfs (235,300 acre-ft per year).

Extremes--Maximum discharge during year, 3,160 cfs July 31 (gage height, 5.40 ft); minimum daily, 47 cfs Apr. 30. 1926-61: Maximum discharge, 14,800 cfs May 9, 1957 (gage height, 11.35 ft), from rating curve extended above 9,500 cfs; minimum daily, 4.4 cfs Apr. 1, 1950.

Remarks--Records good. Discharge measurements generally made at least twice a month. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals, diversions for irrigation of about 253,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 6, 7)

Oct. 1 to Mar. 7

Mar. 8 to Sept. 30

1.6	53	2.4	220	1.5	46	2.3	250	3.5	1,010
1.8	79	2.8	380	1.7	76	2.7	445	4.0	1,480
2.0	116	3.5	880	2.0	142	3.0	620	5.0	2,620

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	95	71	75	63	69	170	120	563	400	725	620
2	60	84	72	63	71	73	162	350	888	776	641	516
3	78	86	73	72	73	110	162	467	1,320	581	816	1,340
4	94	91	93	73	72	190	184	562	1,340	440	250	856
5	93	88	89	76	69	180	282	544	992	445	143	607
6	91	78	73	71	69	178	295	500	896	522	295	365
7	89	76	71	63	69	163	295	450	856	643	538	310
8	89	78	75	72	71	159	290	420	1,210	533	562	277
9	89	82	71	72	71	143	246	400	947	574	450	174
10	75	82	63	72	63	156	153	340	904	500	450	167
11	93	79	72	69	66	143	223	320	800	445	574	191
12	94	81	71	69	65	153	210	375	763	555	472	194
13	91	82	63	69	64	162	90	1,410	607	462	533	162
14	175	82	69	66	63	264	92	1,240	581	420	824	170
15	291	79	69	65	64	254	95	739	840	375	929	159
16	78	82	66	65	63	236	94	776	840	360	697	132
17	61	73	66	82	69	241	93	562	607	325	588	205
18	685	72	66	84	66	380	223	385	600	282	832	263
19	387	69	69	79	65	130	103	335	533	223	711	498
20	121	69	72	71	65	105	109	365	600	213	494	1,330
21	102	65	69	71	63	114	125	1,550	544	542	420	583
22	95	65	63	72	61	103	135	1,170	420	430	473	360
23	86	63	71	72	64	96	174	956	365	295	472	614
24	84	71	71	72	63	100	236	690	489	223	450	1,160
25	79	71	71	72	61	100	456	832	445	205	430	965
26	73	69	63	69	60	93	202	956	410	240	484	792
27	73	69	71	69	64	100	123	641	506	330	506	800
28	81	69	76	72	66	254	63	506	523	420	562	753
29	91	69	75	72	-	183	57	472	473	380	563	725
30	83	71	73	74	-----	191	47	533	425	480	555	690
31	83	-----	73	70	-----	184	-----	533	-----	963	792	-----
Total	3,851	2,301	2,240	2,223	1,853	5,032	5,210	19,499	21,312	13,602	17,245	16,483
Mean	124	76.7	72.3	71.7	66.4	162	174	629	710	439	556	550
Ac-ft	7,640	4,560	4,440	4,410	3,690	9,980	10,330	38,680	42,270	26,980	34,210	32,700

Calendar year 1960: Max 1,810 Min 24 Mean 322 Ac-ft 233,400  
Water year 1960-61: Max 1,840 Min 47 Mean 304 Ac-ft 219,900



## PLATTE RIVER BASIN

6-7225. South St. Vrain Creek near Ward, Colo.

Location.--Lat 40°05'27", long 105°30'50", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.36, T.2 N., R.73 W., on left bank at downstream side of bridge, 1.3 miles north of Ward and  $\frac{3}{2}$  miles downstream from Brainard Lake.

Drainage area.--14.4 sq mi.

Records available.--October 1925 to September 1927, October 1928 to September 1931, September 1954 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder. Altitude of gage is 9,372 ft (from topographic map). May 29, 1926, to Sept. 30, 1927, and May 21, 1929, to Sept. 30, 1931, at site 600 ft downstream at datum 24.37 ft lower.

Average discharge.--12 years, 29.8 cfs (21,570 acre-ft per year).

Extremes.--Maximum discharge during year, 240 cfs June 21 (gage height, 3.83 ft); minimum not determined.

1925-27, 1928-31, 1954-61: Maximum discharge, 462 cfs June 29, 1957; maximum gage height, 4.11 ft June 27, 1957; minimum daily discharge determined, 1 cfs Mar. 20, 1930.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station. Slight regulation by several small lakes above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1 to Dec. 7, Apr. 1 to Sept. 30)

2.4	3.2	3.1	39
2.5	4.7	3.3	57
2.6	7.6	3.5	96
2.7	12	3.7	180
2.9	24	3.9	310

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	6.5	b 2.8					4.6	*130	*123	60	25
2	6.2	6.2	3.1					5.6	150	103	56	23
3	4.8	5.8	3.0					6.2	123	92	59	25
4	4.0	4.3	b 3.1					6.4	87	94	51	25
5	3.5	4.0	b 2.4					5.6	72	100	45	28
6		4.2	b 2.3					5.2	71	90	41	30
7	3.2	4.0	b 2.3					*5.0	*74	88	37	*30
8	3.1	b 4.3	2.3				3.0	5.6	120	110	43	32
9	3.1	b 4.8	2.4					7.0	150	120	43	35
10	3.6	4.5	2.4					19	155	80	39	43
11	4.0	4.2	2.4					32	127	67	35	42
12	4.3	3.5	2.4					37	130	72	*33	37
13	3.6	3.2	2.5	(*)	(*)	(*)	(*)	39	140	54	33	33
14	5.2	3.1	2.5					33	135	52	31	30
15	9.3	3.1	2.4					25	127	52	30	27
16	6.5	b 3.0	2.5	2.2	2.0	3.0		24	116	52	29	25
17	5.8	b 3.2	2.5					25	135	49	33	25
18	7.2	2.7	2.6					31	135	47	33	25
19	8.4	*2.7	2.6					39	127	47	33	33
20	*5.5	2.5	2.4					45	175	47	31	37
21	4.7	2.6	2.4					49	210	59	30	39
22	4.5	2.7	2.4					53	204	54	29	37
23	4.3	2.5	2.5				4.5	60	165	44	27	36
24	4.5	2.4	2.5					62	135	41	25	33
25	4.5	2.5	2.5					64	120	43	25	29
26	4.5	2.4	2.4					60	120	48	30	28
27	4.5	2.5	2.4					74	116	47	27	26
28	4.3	b 2.4	2.3					83	123	47	25	27
29	b 4.7	b 2.5	2.3					94	113	47	23	30
30	5.2	b 2.7	2.4					116	116	47	24	25
31	6.0	-----	2.4					127	-----	52	26	-----
Total	153.7	105.0	77.4	68.2	56.0	93.0	112.5	1242.2	3901	2068	1086	920
Mean	4.96	3.50	2.50	2.2	2.0	3.0	3.75	40.1	130	66.7	35.0	30.7
Ac-ft	305	208	154	135	111	184	223	2,460	7,740	4,100	2,150	1,820

Calendar year 1960: Max 191 Min - Mean 25.1 Ac-ft 18,190  
Water year 1960-61: Max 210 Min - Mean 27.1 Ac-ft 19,590

Peak discharge (base, 170 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-2	4:30p.m.	3.71	186	6-21	11:30p.m.	3.83	240
6-8	11p.m.	3.71	186				

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 8 to May 7 (stage-discharge relation affected by ice during most of period), July 3-15.

## PLATTE RIVER BASIN

35

6-7240. St. Vrain Creek at Lyons, Colo.

Location.--Lat 40°13'05", long 105°15'34", in NW¼NW¼ sec.20, T.3 N., R.70 W., on left bank 75 ft southwest of State Highway 7 and 66 at southeast edge of Lyons, 400 ft upstream from headgate of St. Vrain Supply Canal, and 0.4 mile downstream from confluence of North and South St. Vrain Creeks.

Drainage area.--212 sq mi.

Records available.--August 1887 to September 1891, June 1895 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Published as "near Lyons" 1901, 1903.

Gage.--Water-stage recorder. Altitude of gage is 5,292 ft (from topographic map). Prior to Apr. 6, 1923, staff gages near present site at different datums. Apr. 6, 1923, to Sept. 30, 1956, water-stage recorder at same site at datum 1.00 ft higher.

Average discharge.--70 years, 132 cfs (95,560 acre-ft per year).

Extremes.--Maximum discharge during year, 2,540 cfs June 3 (gage height, 5.73 ft), from rating curve extended above 960 cfs; minimum daily, 0.7 cfs Nov. 17.

1887-91, 1895-1961: Maximum discharge, 10,500 cfs June 22, 1941 (gage height, 8.06 ft, from floodmark), from rating curve extended above 2,100 cfs on basis of slope-area measurement at gage height 7.90 ft; no flow Jan. 19, 20, 1922, Jan. 12, 13, 1950.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Discharge measurements generally made twice a month. Diversions above station for irrigation of about 20,000 acres. Flow partly regulated by small reservoirs above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

1.7	0	2.3	32	3.4	305
1.8	1.4	2.5	60	3.8	500
1.9	4.0	2.7	98	4.3	910
2.0	8.0	3.0	170	4.7	1,310
2.1	14				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	13	9.8	a 6.6	a 3.7	16	43	96	642	440	165	86
2	16	18	14	a 6.5	a 3.4	16	46	92	955	390	173	80
3	16	16	16	a 6.6	a 3.3	17	67	113	1,240	354	154	94
4	16	16	14	a 6.8	a 3.4	17	100	122	946	329	142	82
5	15	13	7.6	a 7.2	a 3.3	a 15	98	125	722	329	130	78
6	14	12	7.6	7.2	3.5	a 14	86	113	698	317	118	86
7	14	13	a 6.8	7.2	3.7	16	73	107	650	333	109	80
8	13	16	a 8.2	7.6	4.0	14	69	105	748	345	125	82
9	13	10	a 11	8.0	4.8	16	60	98	838	228	113	92
10	14	8.6	13	7.6	5.2	15	69	102	919	188	107	109
11	16	16	13	7.2	6.8	13	65	132	784	204	107	100
12	16	18	9.2	7.2	7.2	12	64	162	748	218	100	88
13	16	15	10	6.4	6.4	12	74	260	757	194	113	78
14	19	13	11	6.8	5.6	14	73	277	793	185	120	73
15	21	6.4	9.8	7.2	5.2	16	52	350	757	182	107	67
16	20	1.1	9.2	6.8	5.2	22	50	470	666	173	98	62
17	16	7	9.8	6.8	5.6	28	46	507	698	165	166	62
18	15	1.4	10	6.8	4.8	31	57	458	674	154	152	71
19	16	4.8	10	6.0	a 4.5	31	78	446	610	144	130	111
20	13	1.9	10	6.4	a 4.7	31	111	476	714	144	113	154
21	9.2	1.1	10	6.8	a 5.2	38	102	458	714	200	111	132
22	11	1.4	10	6.8	5.6	39	100	435	674	191	102	162
23	13	1.0	10	6.4	11	40	94	470	602	147	92	214
24	14	5.2	9.8	5.2	10	44	82	452	535	134	84	291
25	13	4.8	9.2	4.4	13	50	74	430	500	132	84	221
26	15	3.0	8.0	4.0	15	47	69	381	435	149	111	185
27	19	13	8.6	a 2.9	15	43	62	420	420	142	102	165
28	18	6.4	7.2	a 3.1	15	42	58	464	430	127	92	152
29	18	2.2	a 6.6	a 3.1	-	38	58	528	420	122	86	185
30	13	3.5	a 6.2	a 3.2	-----	37	65	626	425	118	88	185
31	12	-----	a 6.6	a 3.3	-----	42	-----	658	-----	139	98	-----
Total	471.2	260.5	302.2	188.1	184.1	826	2145	9933	20714	6617	3597	3627
Mean	15.2	8.68	9.75	6.07	6.58	26.6	71.5	320	690	213	116	121
Ac-ft	935	517	599	373	365	1,640	4,250	19,700	41,090	13,120	7,130	7,190

Calendar year 1960: Max 612 Min 0.7 Mean 97.6 Ac-ft 70,830  
 Water year 1960-61: Max 1,240 Min 0.7 Mean 134 Ac-ft 96,910

a No gage-height record.

## PLATTE RIVER BASIN

6-7255. Middle Boulder Creek at Nederland, Colo.

Location.--Lat 39°57'42", long 105°30'14", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.13, T.1 S., R.73 W., on left bank at Nederland just downstream from North Beaver Creek, 1,000 ft upstream from Barker Reservoir.

Drainage area.--36.2 sq mi.

Records available.--June 1907 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder and compound sharp-crested weir. Datum of gage is 8,186.0 ft above mean sea level (Public Service Co. bench mark). Prior to Mar. 18, 1909, at datum 4.0 ft lower. Mar. 18, 1909, to Apr. 23, 1952, at datum 2.5 ft lower than present datum.

Average discharge.--54 years, 54.1 cfs (39,170 acre-ft per year).

Extremes.--Maximum discharge during year, 412 cfs June 2 (gage height, 2.97 ft); minimum daily, 4.7 cfs Jan. 23, Feb. 14, Mar. 7, 8. 1907-61: Maximum discharge, 811 cfs June 2, 1914 (gage height, 5.37 ft, datum then in use), by computation of peak flow over compound weir; minimum daily, 0.8 cfs Jan. 14, 1908.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No diversion above station. Flow regulated at times by Jasper Lake (capacity, 326 acre-ft). North Beaver Creek entered Middle Boulder Creek downstream from station June 1 to Dec. 31, 1907, March 1911 to Dec. 31, 1916.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	3.5	1.5	91
.5	9.5	2.0	188
.8	18	3.0	420
1.1	34		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	14	8.1	6.3	5.5	5.1	6.5	39	*292	204	77	36
2	13	13	7.9	5.9	5.3	5.3	7.3	46	333	180	74	33
3	13	12	7.9	6.3	5.7	5.3	10	49	326	164	83	40
4	12	12	7.9	6.1	5.5	5.1	11	41	255	158	69	40
5	12	12	8.1	5.9	5.3	5.1	8.7	*40	222	154	59	50
6	12	11	7.9	6.1	5.5	5.3	7.7	34	222	140	53	54
7	12	*12	7.9	6.3	*5.5	4.7	*7.5	33	243	146	47	60
8	12	10	7.7	6.3	5.3	4.7	7.3	33	304	140	*52	63
9	12	9.5	7.5	6.3	5.3	5.1	7.1	41	326	130	49	70
10	14	12	7.5	6.3	5.9	5.3	7.5	70	299	114	*46	93
11	14	12	7.3	6.1	6.3	4.9	7.1	106	273	105	42	78
12	14	11	7.3	6.1	6.1	4.9	7.9	124	273	93	44	72
13	13	10	7.1	*6.1	5.3	5.3	8.3	124	273	91	46	70
14	15	10	*6.9	6.1	4.7	5.3	7.3	94	*273	91	45	64
15	14	8.5	6.9	6.3	5.3	6.3	7.7	85	259	89	40	*60
16	16	8.5	6.7	5.9	5.5	7.3	7.1	85	241	86	39	62
17	17	9.5	6.7	5.9	5.5	6.7	8.3	89	266	81	57	64
18	17	10	6.9	5.7	5.1	6.3	12	105	266	80	52	64
19	16	9.5	7.1	5.7	5.1	6.5	18	136	255	77	46	74
20	16	8.9	6.9	5.9	5.9	5.7	*24	168	323	*77	41	83
21	15	9.3	6.9	5.3	*5.1	5.7	22	184	297	93	40	85
22	14	9.5	7.5	4.9	5.3	*6.7	22	202	278	74	36	81
23	14	9.1	7.7	4.7	5.5	6.5	25	216	250	59	34	78
24	14	10	7.5	4.9	5.5	7.3	21	212	228	57	32	77
25	*12	9.1	7.3	5.1	6.1	7.5	19	204	210	59	34	70
26	12	9.1	7.1	5.3	5.3	7.3	18	204	210	66	41	a 64
27	12	7.9	6.9	5.3	5.1	6.5	16	241	206	64	34	a 63
28	12	6.7	6.7	5.5	5.1	6.3	19	246	196	62	*33	*66
29	9.5	*9.5	6.5	5.5	-	6.5	25	262	188	62	31	77
30	7.1	8.9	6.7	5.7	-----	6.5	34	307	*192	63	34	64
31	13	-----	6.5	5.7	-----	6.3	-----	304	-----	77	40	-----
Total	411.6	304.5	225.5	179.5	152.6	183.3	409.3	412.4	778.4	3141	1450	1955
Mean	13.3	10.2	7.27	5.79	5.45	5.91	13.6	133	259	101	46.8	65.2
Ac-ft	816	604	447	356	303	364	812	8,180	15,440	6,220	2,880	3,880

Calendar year 1960: Max 375 Min 4.7 Mean 62.2 Ac-ft 45,130  
 Water year 1960-61: Max 333 Min 4.7 Mean 55.7 Ac-ft 40,310

Peak discharge (base, 280 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-2	8p.m.	2.97	412	6-20	3a.m.	2.81	372
6-8	9p.m.	2.87	388				

\* Discharge measurement made on this day.

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 16, 25-29, Dec. 4, 5, 16-19, 21, 22, Dec. 29 to Jan. 6, Jan. 9, 14-16, 19-23, 27-30, Feb. 5-9, 13-16, 18-22, 24, Mar. 1, 8, 12.

6-7270. Boulder Creek near Orodell, Colo.

Location--Lat 40°00'23", long 105°19'49", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 34, T.1 N., R.71 W., on left bank along State Highway 119, 0.7 mile southwest of old Orodell, 1 mile upstream from Fourmile Creek, and 3 miles southwest of courthouse in Boulder.

Drainage area--102 sq mi.

Records available--August to October 1887, April to October 1888, October 1906 to November 1914, March 1916 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Figures of daily discharge for Feb. 3-10, 17-25, 1912, published in WSP 326, have been found to be unreliable and should not be used. Published as North Boulder Creek, Colorado 1887-88 and as "at Orodell" March 1907 to December 1916.

Gage--Water-stage recorder. Altitude of gage is 5,826 ft (from topographic map). Prior to Sept. 1, 1907, staff gage and Sept. 1, 1907, to May 11, 1917, water-stage recorder, at sites 1 mile downstream, just upstream from Fourmile Creek, at different datums.

Average discharge--53 years (1906-14, 1916-61), 92.5 cfs (66,970 acre-ft per year).

Extremes--Maximum discharge during year, 634 cfs June 20 (gage height, 3.53 ft); minimum daily, 3.2 cfs Nov. 19, 22, 24. 1887-88, 1906-13, 1916-61: Maximum discharge, 2,500 cfs June 6, 1921 (gage height, 4.31 ft), from rating curve extended above 1,200 cfs; minimum daily, 1 cfs Jan. 29, Feb. 1-3, 16-24, 1933.

Remarks--Records good. Flow regulated by Barker Reservoir (capacity, 11,500 acre-ft). Low flow during nonirrigation season regulated by Orodell powerplant 1,500 ft upstream from station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	6.0	4.6	4.1	3.7	3.5	4.8	7.0	1.59	2.94	1.30	6.9
2	4.8	6.3	4.6	3.7	3.4	3.2	2.5	6.1	1.88	2.82	1.32	6.6
3	4.6	5.8	5.1	4.5	4.9	4.6	4.7	6.7	2.10	2.59	1.46	7.0
4	3.2	5.8	4.8	5.4	3.8	2.3	8.8	6.3	1.71	2.37	1.30	8.2
5	1.6	5.6	5.5	4.6	7.7	2.6	6.9	*6.8	2.00	2.30	1.14	8.6
6	1.4	4.6	4.4	5.4	3.5	4.0	7.4	6.4	1.97	2.14	1.04	8.9
7	1.4	*5.8	4.7	5.3	*3.4	3.3	*3.2	5.4	1.96	2.08	.94	8.2
8	1.4	1.4	5.2	4.6	3.3	*3.4	2.3	5.4	2.25	2.04	*8.4	7.6
9	1.4	6.4	5.7	4.4	3.2	3.2	2.3	5.8	2.57	1.92	.80	7.6
10	1.4	5.0	5.3	5.1	6.1	3.6	2.6	5.6	3.24	1.80	.79	8.0
11	1.5	4.4	4.8	5.8	3.0	4.2	2.1	8.8	3.75	*1.74	.76	8.7
12	1.5	4.1	5.8	5.6	7.0	1.5	1.9	8.9	4.04	1.62	.76	9.5
13	*1.5	3.9	5.3	*5.6	4.2	3.6	2.1	1.00	4.46	1.37	.84	8.2
14	1.8	4.1	*5.3	3.7	3.2	2.0	2.0	.95	4.47	1.30	.79	7.3
15	1.8	3.4	5.2	4.1	2.5	2.9	2.2	1.29	*4.49	1.30	.77	*7.3
16	1.6	7.0	5.2	5.8	3.5	3.4	2.1	1.68	3.85	1.22	.71	.78
17	1.6	7.0	5.4	5.3	4.6	5.8	1.7	1.61	3.89	1.19	.77	4.9
18	1.6	3.6	4.5	5.9	2.7	3.7	2.4	1.55	3.97	1.32	.82	7.3
19	1.2	3.2	4.9	4.5	2.7	1.5	3.9	1.65	3.99	1.30	.80	.78
20	1.1	3.6	4.8	5.6	3.4	3.9	*5.1	1.65	4.79	*1.37	.74	1.17
21	1.0	3.6	6.4	4.1	3.0	3.4	6.3	1.67	4.80	1.65	.73	1.48
22	9.0	3.2	4.5	5.0	3.3	*3.6	5.5	1.63	4.48	1.43	.70	1.62
23	9.0	5.8	4.9	5.2	3.7	3.7	5.1	1.51	4.10	1.22	.69	1.52
24	8.6	3.2	5.5	5.2	*3.6	6.4	5.9	1.50	3.73	1.04	.67	1.47
25	*8.0	3.9	5.0	5.2	4.1	4.9	5.5	1.49	3.27	.91	.66	1.45
26	7.5	3.9	4.3	4.3	1.8	1.8	4.8	*1.40	3.06	.96	.76	1.24
27	7.7	3.9	5.0	4.7	3.3	5.6	4.5	1.40	2.52	1.02	.74	1.17
28	7.2	1.2	5.6	3.9	3.0	3.6	4.8	1.30	2.74	.96	*7.4	*1.15
29	7.7	*4.8	4.9	9.0	-	3.3	5.2	1.50	2.82	1.00	.73	1.24
30	5.6	4.3	4.7	3.6	-----	4.1	4.6	1.53	*2.82	1.03	.69	1.40
31	6.5	-----	5.1	3.2	-----	4.4	-----	1.62	-----	1.17	.73	-----
Total	507.8	240.1	1.570	1.443.0	923.7	1.110	1.232	3.585	9.731	4.917	2.653	2.955
Mean	16.4	8.00	50.6	46.5	33.0	35.8	41.1	116	324	159	85.6	98.5
Ac-ft	1,010	476	3,110	2,860	1,830	2,200	2,440	7,110	19,300	9,750	5,260	5,860

Calendar year 1960: Max 625 Min 3.2 Mean 94.4 Ac-ft 68,540  
 Water year 1960-61: Max 480 Min 3.2 Mean 84.6 Ac-ft 61,210

\* Discharge measurement made on this day.



## PLATTE RIVER BASIN

6-7295. South Boulder Creek near Eldorado Springs, Colo.

Location--Lat 39°55'52", long 105°17'43", in SE $\frac{1}{4}$  sec.26, T.1 S., R.71 W., on left bank 0.2 mile downstream from South Draw, 1 mile west of Eldorado Springs, 1 $\frac{1}{2}$  miles downstream from South Boulder diversion canal, 5 miles south of Boulder, and about 6 miles downstream from Gross Reservoir.

Drainage area--109 sq mi.

Records available--April 1888 to October 1892, May 1895 to September 1901, August 1904 to September 1961. No winter records for water years 1889-92, 1900. Monthly discharge only for some periods, published in WSP 1310. Prior to January 1911, published as "at" or "near Marshall"; January 1911 to December 1913 as "at Eldorado Springs." Records for periods June 1900 to September 1901, August 1904 to September 1908, October 1909 to September 1911 are not adjusted for diversions by Community ditch and South Boulder and Coal Creek ditch, all other records contain flow in these ditches.

Gage--Water-stage recorder. Altitude of gage is 6,080 ft (from topographic map). Prior to Sept. 25, 1929, staff gage or water-stage recorder at sites 1 mile downstream at different datums. Sept. 25, 1929, to May 2, 1934, water-stage recorder at site a quarter of a mile downstream at different datum. May 3, 1934, to Sept. 3, 1938, water-stage recorder at site 250 ft upstream at datum 4.00 ft higher than present datum. Sept. 4, 1938, to May 9, 1940, staff gages at site about 300 ft upstream or water-stage recorder at site half a mile downstream at different datums.

Average discharge--55 years (1895-99, 1908-9, 1911-61), 77.8 cfs (56,320 acre-ft per year), adjusted for storage and diversion.

Extremes--Maximum discharge during year, 375 cfs June 21 (gage height, 2.90 ft); minimum not determined.

1888-92, 1895-1901, 1940-61: Maximum discharge, 7,390 cfs Sept. 2, 1938 (gage height, 9.24 ft, from floodmarks, site and datum then in use), from rating curve extended above 600 cfs on basis of slope-area measurement of peak flow; no flow Oct. 15, 1932.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. Many small diversions above station for irrigation. Water is imported above Gross Reservoir from Colorado River basin through Moffat water tunnel (see elsewhere in this report). Flow regulated since May 1, 1955, by Gross Reservoir (capacity, 43,060 acre-ft), about 6 miles above station. Contents Sept. 30, 1961, 42,960 acre-ft. Change in contents during water year 1961, +5,550 acre-ft. City of Denver diverts water 1 $\frac{1}{2}$  miles above station (59,920 acre-ft in water year 1961).

Cooperation--Contents of Gross Reservoir and diversion by City of Denver furnished by State engineer of Colorado.

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	18	8.9			5.7	21	33	*268	229	49	29
2	10	4.3	8.9			30	22	46	289	192	47	30
3	10	4.0	9.3			9.6	26	46	268	146	47	34
4	10	4.0	b 8.9			9.3	30	49	232	158	60	32
5	11	4.0	b 8.0			8.9	30	*50	210	195	78	31
6	10	4.0			7	10	28	49	192	165	78	30
7	10	*4.0			(*)	10	*26	50	175	152	62	29
8	8.6	4.0	7			*10	25	54	178	142	*52	29
9	8.2	4.3				10	24	62	178	155	52	28
10	8.2	8.0				8.9	25	62	178	122	52	29
11	8.8	8.0				9.3	51	60	182	*125	52	31
12	12	6.1		(*)		8.9	20	58	182	130	52	97
13	*9.3	7.8				9.3	85	143	206	98	55	162
14	12	9.6		(*)		9.6	40	213	225	100	54	162
15	14	12				10	34	229	*225	95	52	168
16	14	12	5	7	37	10	34	284	221	85	50	168
17	14	12				11	33	316	225	80	50	168
18	19	12				11	33	307	225	73	50	103
19	16	12				8.9	32	302	236	82	49	49
20	14	12				9.3	*32	298	276	*82	49	57
21	14	12				*54	9.6	32	294	335	49	54
22	19	12				54	*10	31	316	284	49	54
23	24	11				54	11	30	335	280	47	78
24	24	11				54	12	30	256	298	40	103
25	*24	10				54	14	29	202	248	34	100
26	24	10	6			54	13	25	*202	217	34	98
27	24	9.6				55	16	22	199	232	34	95
28	24	8.9				55	21	22	199	217	*34	*95
29	22	*b 9.3				-	21	21	199	202	33	98
30	25	9.3				-----	21	21	202	*229	47	95
31	30	-----				-----	21	-----	225	-----	50	-----
Total	483.1	265.2	195.0	217	87.4	430.6	98.4	534.0	691.3	332.5	150.4	233.6
Mean	15.6	8.84	6.29	7	31.2	13.9	32.8	172	230	107	48.5	77.9
Ac-ft	958	526	387	430	1,730	854	1,950	10,590	13,710	6,600	2,980	4,630

Adjusted for storage in Gross Reservoir and diversion to Denver

Mean	5.99	12.0	13.4	13	10.7	20.5	40.0	252	340	104	45.5	83.6
Ac-ft	367	714	822	794	590	1,260	2,380	15,490	20,250	6,390	2,800	4,970

Observed

Calendar year 1960: Max	430	Min	-	Mean	72.4	Ac-ft	52,590
Water year 1960-61: Max	335	Min	-	Mean	62.6	Ac-ft	45,340

Adjusted

Calendar year 1960: Mean	81.0	Cfsm	In.	Ac-ft	58,860
Water year 1960-61: Mean	78.5	Cfsm	In.	Ac-ft	56,820

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 6 to Feb. 20 (stage-discharge relation affected by ice during most of period), Apr. 13-19.

## PLATTE RIVER BASIN

39

6-7303. Coal Creek near Plainview, Colo.

Location.--Lat 39°52'40", long 105°16'36", in SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.13, T.2 S., R.71 W., on left bank 40 ft upstream from culvert on State Highway 72,  $\frac{1}{4}$  miles south of Plainview, 5 miles downstream from Beaver Creek, and 9 miles north of Golden.

Drainage area.--15.1 sq mi.

Records available.--August 1959 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,540 ft (from topographic map).

Extremes.--Maximum discharge during year, 60 cfs May 17 (gage height, 1.60 ft); no flow Oct. 1-13.

1959-61: Maximum discharge, 164 cfs May 7, 1960 (gage height, 1.92 ft), from rating curve extended above 81 cfs; no flow for many days in each year.

Remarks.--Records good except those for periods of ice effect, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	0	0.8	3.7
.3	.1	1.0	7.5
.4	.2	1.2	14
.5	.6	1.4	29
.6	1.3	1.6	60
.7	2.4		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0	1.2	0.4	0.4	*0.7	*1.1	7.5	*22	13	2.4	3.4	0.7
2	0	1.2	.4	.4	.6	1.2	8.3	21	*1.4	2.0	2.6	.6
3	0	1.2	.4	.4	.6	1.6	11	23	1.4	1.8	4.2	4.7
4	0	1.2	.4	.4	.6	2.4	*15	22	1.4	1.6	*2.5	8.9
5	0	1.1	.3	.4	.6	2.2	15	21	1.4	1.8	2.2	11
6	0	1.0	.3	.4	.6	2.0	13	18	1.4	*1.8	2.0	11
7	0	*1.1	.3	.5	.6	2.3	11	16	1.3	1.5	2.1	9.1
8	0	1.0	.3	.5	.6	2.6	10	*16	1.2	3.4	2.8	*7.3
9	0	.9	.3	.5	.5	2.8	10	16	1.2	3.9	2.0	4.4
10	0	.9	.3	*.5	.7	3.0	10	16	1.0	2.2	1.9	5.3
11	0	.8	.3	.5	1.0	3.2	11	17	9.7	2.4	1.7	4.9
12	0	.7	.3	.5	1.1	3.0	11	20	8.8	2.9	1.5	4.4
13	0	.6	.3	.4	1.0	2.9	12	25	8.0	2.2	1.4	4.0
14	.1	.5	.3	.4	1.0	3.0	11	34	8.6	2.8	3.4	3.7
15	.1	.3	.3	.4	.8	3.0	11	*47	10	2.8	2.1	3.4
16	.1	.4	.3	.4	.9	3.2	11	49	8.3	2.0	1.7	2.9
17	.1	.4	.4	.4	.8	3.3	12	55	7.3	1.6	1.7	2.4
18	2.0	.4	.4	.4	1.1	3.3	14	46	6.5	1.2	3.3	2.2
19	3.9	.4	.3	.5	1.2	3.6	17	37	6.3	1.1	1.9	5.6
20	5.1	.4	.3	.5	1.0	4.7	*23	37	6.9	1.2	1.5	13
21	4.6	.4	.3	.5	1.0	6.1	26	33	5.3	3.2	1.5	10
22	3.3	.3	.4	.4	.7	6.3	26	28	4.7	2.6	1.6	10
23	2.6	.4	.4	.4	.7	7.3	27	27	4.4	1.8	1.1	13
24	2.2	.4	.4	.4	.8	8.6	26	24	4.6	1.5	.9	16
25	1.9	.4	.4	.4	.8	9.4	24	23	4.4	1.3	.7	15
26	1.8	.4	.3	.3	.7	9.0	19	19	3.6	1.2	.7	13
27	1.6	.4	.3	.4	.6	7.8	17	16	3.2	1.1	.5	12
28	1.6	.3	.3	.5	.6	6.9	15	15	3.0	1.0	.5	10
29	1.5	.4	.4	.6	-	7.5	*15	13	2.6	.8	.4	9.4
30	1.3	*.4	.4	.7	-----	6.7	18	13	2.4	1.0	.4	8.3
31	1.2	-----	.4	.7	-----	7.5	-----	12	-----	2.9	1.5	-----
Total	35.0	19.5	10.6	14.1	21.9	137.5	456.8	781	248.6	61.0	55.7	226.2
Mean	1.13	0.65	0.34	0.45	0.78	4.44	15.2	25.2	8.29	1.97	1.80	7.54
Ac-ft	69	39	21	28	43	273	906	1,550	493	121	110	449

Calendar year 1960: Max 105 Min 0 Mean 5.97 Ac-ft 4,340

Water year 1960-61: Max 55 Min 0 Mean 5.67 Ac-ft 4,100

Peak discharge (base, 25 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-22	6p.m.	1.39	28	7-8	7p.m.	1.51	44
5-17	6a.m.	1.60	60	9-19	10p.m.	1.37	26

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 5 to Jan. 9, Jan. 24-29, Feb. 27, 28, Mar. 5-9.

## PLATTE RIVER BASIN

6-7310. St. Vrain Creek at mouth, near Platteville, Colo.

Location.--Lat 40°15'29", long 104°52'45", in SE<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub> sec. 3, T.3 N., R.67 W., on right bank 140 ft downstream from bridge on county road, 1.3 miles upstream from mouth, and 4 miles northwest of Platteville.

Drainage area.--976 sq mi.

Records available.--July 1904 to December 1906, April to December 1915, March 1927 to September 1961. Prior to October 1933, monthly discharge only, published in WSP 1310.

Gage.--Water-stage recorder. Altitude of gage is 4,740 ft (from topographic map). July 1, 1904, to Dec. 31, 1906, and Apr. 1 to Dec. 31, 1915, staff gage at bridge 140 ft upstream at different datums. Feb. 24, 1927, to June 10, 1939, water-stage recorder at bridge 140 ft upstream and June 11, 1939, to Apr. 24, 1960, water-stage recorder at site 180 ft upstream at different datum.

Average discharge.--36 years (1904-6, 1927-61), 194 cfs (140,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,220 cfs June 4 (gage height, 6.50 ft); minimum daily, 57 cfs Jan. 27. 1904-6, 1915, 1927-61: Maximum discharge, 11,300 cfs Sept. 3, 1938 (gage height, 8.93 ft site and datum then in use), from rating curve extended above 4,700 cfs; minimum daily, 12 cfs Apr. 23, 1935.

Remarks.--Records good except those for period of no gage-height record, which are fair. Discharge measurements generally made twice a month. Diversions above station for irrigation of about 177,000 acres. Flow partly regulated by many small reservoirs above station.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 16-25, Nov. 16-30, Mar. 25 to Apr. 4, Sept. 7-19)

Oct. 1 to Nov. 5		Nov. 6 to June 4			June 5 to Sept. 30				
1.5	61	1.4	57	4.0	850	1.4	70	4.0	1,060
2.0	117	1.8	106	5.0	1,550	1.8	144	5.4	2,300
2.5	187	2.4	225	6.5	3,220	2.5	330		
3.0	280	3.0	390			3.0	515		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	105	105	127	127	127	111	200	95	1,020	171	321	129
2	105	105	124	116	117	116	186	96	1,060	198	379	126
3	105	104	124	114	111	124	161	99	a 1,920	157	315	246
4	97	104	135	120	120	136	173	114	a 2,950	120	282	340
5	94	104	148	126	117	126	207	131	3,270	120	243	294
6	94	103	109	120	103	116	197	171	2,120	131	249	255
7	88	103	95	131	108	127	207	138	1,810	120	225	215
8	88	103	102	133	114	117	186	150	1,720	159	215	195
9	88	114	103	133	116	120	171	138	1,800	261	215	188
10	88	117	120	122	117	126	165	124	1,880	198	208	180
11	88	120	124	116	136	135	150	117	1,920	171	212	176
12	88	120	114	116	119	138	133	127	1,830	171	210	178
13	87	120	111	112	103	112	122	334	1,750	151	195	171
14	103	119	111	108	109	114	116	946	1,740	140	228	168
15	138	119	116	105	111	112	109	730	1,700	157	200	166
16	136	119	111	114	106	109	108	710	1,600	168	176	157
17	124	117	112	120	111	109	103	880	1,430	153	131	146
18	140	119	116	119	114	151	99	832	1,390	135	208	140
19	202	120	109	117	103	163	96	898	1,190	122	162	153
20	174	117	114	116	112	159	100	934	1,110	133	157	354
21	157	117	111	124	112	184	103	1,030	1,150	198	159	354
22	147	122	112	126	109	169	103	904	1,070	228	137	291
23	138	124	114	120	112	161	98	892	820	173	137	382
24	134	120	116	122	106	163	96	886	715	159	126	511
25	129	119	114	120	109	175	102	928	605	146	118	560
26	124	116	111	106	112	161	98	964	418	131	116	439
27	118	116	106	57	106	146	89	934	267	225	114	372
28	115	109	103	83	114	190	88	952	148	240	103	348
29	110	109	98	100	-	190	91	952	124	228	96	351
30	106	127	112	117	-----	186	92	1,040	140	235	84	396
31	104	-----	124	120	-----	197	-----	1,110	-----	246	114	-----
Total	3,614	3,431	3,546	3,580	3,154	4,443	3,949	18,356	39,667	5,345	5,835	7,981
Mean	117	114	114	115	113	143	132	592	1,322	172	188	266
Ac-ft	7,170	6,810	7,030	7,100	6,260	8,810	7,830	36,410	78,680	10,600	11,570	15,830

Calendar year 1960: Max 1,060 Min 25 Mean 185 Ac-ft 134,000  
Water year 1960-61: Max 2,950 Min 57 Mean 282 Ac-ft 204,100

a No gage-height record.

## PLATTE RIVER BASIN

41

6-7330. Big Thompson River at Estes Park, Colo.

Location.--Lat 40°22'42", long 105°30'48", in NW¼NW¼ sec.30, T.5 N., R.72 W., on right bank in Estes Park, 600 ft downstream from bridge on State Highway 7 and 66, 900 ft downstream from Black Canyon Creek, and 0.3 mile northwest of Estes powerplant. Station is upstream from Lake Estes.

Drainage area.--137 sq mi.

Records available.--October 1946 to September 1961. Prior to October 1947, published as Thompson River at Estes Park.

Gage.--Water-stage recorder and Parshall flume with overflow weirs. Datum of gage is 7,492.5 ft above mean sea level (levels by Bureau of Reclamation). Prior to May 18, 1949, at site 740 ft downstream at different datum. May 18, 1949, to Mar. 22, 1951, at site 60 ft upstream at datum 1.2 ft higher.

Average discharge.--15 years, 129 cfs (93,030 acre-ft per year), adjusted for inflow from Alva B. Adams tunnel Aug. 10, 1947, to Aug. 2, 1950.

Extremes.--Maximum discharge during year, 955 cfs June 10 (gage height, 5.56 ft); minimum daily, 7.4 cfs Feb. 25, 27.

1946-61: Maximum discharge, 1,660 cfs June 18, 1949 (gage height, 3.16 ft, site and datum then in use); maximum gage height, 6.87 ft June 30, 1957; minimum discharge not determined.

Remarks.--Records good except those for periods of ice effect, which are fair. Discharge measurements generally made twice a month. Diversion from Colorado River basin to Big Thompson River basin above station through Alva B. Adams tunnel began Aug. 10, 1947, and ended Aug. 2, 1950. Small power development and small diversions for irrigation and municipal use above station. Diversions above station from Wind River to Lake Estes (bypassing this station) were 359 acre-ft, May to June 1961.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	5.0	1.2	77	3.0	335
.3	8.4	1.6	123	4.0	531
.4	13	2.0	175	5.0	760
.8	40	2.5	250	6.0	1,160

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	29	18	11	b 8.1	b 8.4	16	50	555	519	246	114
2	35	26	19	9.4	b 8.1	8.4	18	60	740	443	232	102
3	33	28	18	8.1	b 8.1	8.9	22	84	683	392	207	125
4	32	28	18	8.4	b 8.0	b 8.4	25	79	548	364	184	126
5	31	26	15	b 8.4	b 8.0	b 8.4	19	75	477	404	166	135
6	30	25	b 16	b 8.4	b 7.7	b 8.4	18	62	467	383	152	151
7	29	27	b 17	b 8.4	b 7.8	b 8.4	16	56	487	370	156	163
8	30	25	b 17	b 8.4	b 7.8	b 8.9	17	54	655	341	151	164
9	28	23	b 17	b 8.4	b 7.8	8.4	17	55	781	326	145	168
10	31	24	b 16	b 8.4	b 8.0	9.4	17	86	836	292	133	176
11	30	27	b 17	8.4	b 8.0	9.4	15	148	760	275	126	161
12	30	24	b 17	8.9	b 8.2	9.4	16	194	735	246	126	143
13	28	24	b 16	9.4	b 8.4	9.4	20	198	716	225	151	129
14	34	24	b 15	8.9	b 8.6	11	18	170	716	219	148	121
15	37	20	16	8.9	b 8.8	13	18	160	644	216	128	111
16	38	b 18	15	9.4	b 8.9	14	17	168	596	212	130	102
17	43	b 20	15	9.4	9.4	12	18	166	648	206	174	98
18	47	26	b 15	9.9	b 9.2	11	23	182	655	198	172	97
19	43	22	b 14	9.4	b 8.8	11	30	225	658	192	145	107
20	39	23	14	9.4	b 8.6	12	40	295	742	191	131	131
21	36	22	13	9.4	8.9	11	33	328	718	243	126	139
22	34	21	12	9.4	8.9	13	30	353	699	228	119	181
23	33	18	12	9.4	8.4	18	34	415	648	181	109	172
24	32	22	12	9.4	7.7	20	34	389	585	166	101	159
25	32	20	12	9.4	b 7.4	17	32	352	527	166	106	148
26	30	18	12	9.9	7.7	18	29	325	506	168	131	148
27	30	18	11	b 9.4	b 7.4	17	28	383	471	166	126	148
28	30	13	11	b 8.4	b 7.7	13	28	485	455	175	113	155
29	28	17	12	b 8.1	-	15	30	603	453	170	107	216
30	24	20	12	b 7.7	-----	18	39	711	479	167	101	190
31	26	-----	11	b 8.1	-----	16	-----	690	-----	232	114	-----
Total	1,019	678	455	277.9	230.4	374.2	718	7,501	18,740	8,076	4,456	4,280
Mean	32.9	22.6	14.7	8.96	8.23	12.1	23.9	245	625	261	144	143
Ac-ft	2,020	1,340	902	551	457	742	1,420	15,080	37,170	16,020	8,840	8,490

Calendar year 1960: Max 769 Min 10 Mean 116 Ac-ft 84,350  
 Water year 1960-61: Max 836 Min 7.4 Mean 129 Ac-ft 93,030

Peak discharge (base, 600 cfs)

b Stage-discharge relation affected by ice.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-31	1a.m.	5.28	846	6-10	2:30a.m.	5.56	955
6-2	4a.m.	5.15	805	6-21	1a.m.	5.37	878



6-7355. Big Thompson River near Estes Park, Colo.

Location.--Lat 40°22'35", long 105°29'10", in sec.29, T.5 N., R.72 W., on right bank 100 ft upstream from Dry Creek, 500 ft downstream from Olympus Dam, and 1½ miles east of Estes Park.

Drainage area.--156 sq mi.

Records available.--July 1930 to September 1961. Prior to October 1933 monthly discharge only, published in WSP 1310. Published as Thompson River near Estes Park 1934-47.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 7,422.5 ft above mean sea level (levels by Bureau of Reclamation). Prior to Jan. 29, 1934, staff gage on highway bridge  $1\frac{1}{2}$  miles downstream at different datum. Jan. 29, 1934, to Mar. 21, 1951, water-stage recorder at site 0.4 mile downstream at datum 10.5 ft lower.

Extremes.--Maximum discharge during year, 469 cfs June 9 (gage height, 3.70 ft); minimum daily, 6.7 cfs Jan. 4. 1930-61: Maximum discharge observed, 2,800 cfs June 20, 1933, from rating curve extended above 460 cfs (site and datum then in use); maximum gage height, 5.71 ft June 30, 1957; minimum daily discharge, 4.4 cfs Dec. 12, 1940, but may have been less during periods of no gage-height record.

Remarks.--Records excellent. Discharge measurements generally made twice a month. Low flow regulated by Lake Estes since Nov. 30, 1948. Diversion from Colorado River to Big Thompson River basin above station through Alva B. Adams tunnel began Aug. 10, 1947 (see elsewhere in this report for diversion during water year 1961); this imported water was diverted from Lake Estes through Olympus tunnel and bypassed this station. Since May 17, 1955, part of the natural flow of Big Thompson River (55,570 acre-ft in 1961) has also been diverted through Olympus tunnel and returned to the river below the station at mouth of canyon, near Drake. Small power developments and small diversions for irrigation and municipal use above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.2	5.0	0.7	58	2.0	175
.3	8.4	1.0	58	2.5	250
.5	19	1.5	111	3.0	335

Discharge, in cubic feet per second, water year October 1960 to September 1961

Discharge, in cubic feet per second, water year October 1900 to September, 1901												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	33	18	13	12	12	18	53	147	212	147	85
2	39	28	20	11	11	11	20	65	221	134	128	70
3	37	30	20	8.4	11	11	25	89	143	111	118	93
4	36	31	20	6.7	11	11	29	87	120	104	118	93
5	36	28	18	9.4	11	11	22	81	108	143	102	86
6	34	26	24	10	11	11	21	70	118	124	111	81
7	33	30	23	16	11	11	17	64	139	130	115	89
8	33	27	22	17	11	11	19	63	240	104	112	92
9	32	25	20	20	11	11	19	63	263	109	107	90
10	35	26	20	20	11	11	19	93	292	104	96	102
11	35	30	20	14	11	12	17	138	214	113	111	89
12	34	27	20	10	11	12	17	142	181	95	113	70
13	33	27	20	11	11	12	21	140	165	105	136	56
14	38	26	20	11	11	12	20	114	162	118	125	62
15	41	23	17	11	11	12	20	107	110	118	109	58
16	41	22	16	12	11	15	20	117	94	131	114	62
17	46	34	16	12	11	16	20	119	118	125	129	65
18	51	28	18	12	11	16	26	142	120	118	115	64
19	46	26	18	12	11	16	33	166	104	112	108	68
20	43	26	16	12	11	17	43	212	161	112	121	63
21	40	25	14	12	11	16	33	164	189	143	119	66
22	38	24	13	11	11	19	31	144	161	119	111	74
23	38	24	13	11	12	22	34	179	136	100	104	53
24	38	25	13	11	12	24	35	121	89	106	96	54
25	38	22	14	11	12	20	35	98	89	106	114	62
26	34	20	13	11	12	21	32	102	89	112	125	53
27	33	20	13	11	11	19	31	166	126	107	113	62
28	33	15	13	11	11	16	33	211	145	118	102	73
29	32	18	12	11	-	18	33	234	145	115	97	89
30	26	20	13	11	-	20	43	228	171	109	90	75
31	28	-----	13	11	-----	18	-----	117	-----	156	104	-----
Total	1,142	766	530	370.5	313	464	786	3,890	4,565	3,718	3,510	2,199
Mean	36.8	25.5	17.1	12.0	11.2	15.0	26.2	125	152	120	113	73.3
Ac-ft	2,270	1,520	1,050	735	621	920	1,560	7,720	9,050	7,370	6,960	4,360

Calendar year 1960:	Max	225	Min	9.9	Mean	60.7	Ac-ft	44,050
Water year 1960-61:	Max	292	Min	6.7	Mean	61.0	Ac-ft	44,140

6-7380. Big Thompson River at mouth of canyon, near Drake, Colo.

Location.--Lat 40°25'20", long 105°13'35", in NW¼ sec.10, T.5 N., R.70 W., on right bank at mouth of canyon, 500 ft upstream from Handy Ditch diversion dam and 6 miles east of Drake.

Drainage area.--304 sq mi.

Records available.--August 1887 to September 1892, May 1895 to September 1903, October 1926 to September 1933 (no winter records prior to October 1932, except water years 1927-28), April 1938 to September 1949, March 1951 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Published as Big Thompson Creek at Arkins 1887-92, Big Thompson Creek near Arkins 1901-3, Thompson River at mouth of canyon, near Drake 1927-30, 1938-47.

Gage.--Water-stage recorder. Datum of gage is 5,297.47 ft above mean sea level (Bureau of Reclamation bench mark). Aug. 25, 1887, to Sept. 30, 1892, and Apr. 1, 1899, to Sept. 21, 1903, staff gages at sites within half a mile downstream below Handy Ditch diversion dam, at different datums. May 9, 1895, to Mar. 31, 1899, staff gage at site 1½ miles downstream and 600 ft downstream from Home Supply Ditch diversion dam, at different datum. Oct. 1 to Dec. 31, 1926, staff gage at site 6½ miles upstream at different datum. Jan. 1, 1927, to Sept. 30, 1933, water-stage recorder at site 1 mile upstream at different datum. Apr. 19, 1938, to Sept. 30, 1949, water-stage recorder at site 50 ft downstream at datum 1.45 ft lower.

Extremes.--Maximum discharge during year, 1,140 cfs June 3 (gage height, 4.31 ft); minimum daily, 9.0 cfs Nov. 29. 1887-92, 1895-1903, 1926-33, 1938-49, 1951-61: Maximum discharge, 7,600 cfs July 19, 1945 (gage height, 7.55 ft, site and datum then in use), from rating curve extended above 2,200 cfs; minimum daily recorded, 3.2 cfs Nov. 12, 1959.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions above station for irrigation. Diversion from Colorado River to Big Thompson River basin above station through Alva B. Adams tunnel began Aug. 10, 1947 (see elsewhere in this report for diversion for water year 1961); this imported water was diverted through Olympus tunnel and bypassed this station. Part of the natural flow of Big Thompson River has also been diverted through Olympus tunnel since May 17, 1955 (55,570 acre-ft in 1961), and Dille tunnel since Apr. 20, 1959 (21,790 acre-ft in 1961), and returned to the river just below this station.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	8.0	1.5	50	2.5	286
1.1	13	1.7	80	3.0	486
1.3	28	2.0	146	3.5	725

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	40	25	16	19	18	35	80	283	286	158	101
2	45	40	28	13	17	20	36	51	364	227	138	91
3	43	37	30	11	18	21	44	61	560	168	91	108
4	*40	38	26	*12	16	20	53	63	408	141	84	114
5	39	38	15	12	17	18	*51	*61	239	179	112	106
6	39	34	16	11	*14	18	40	53	213	187	114	*112
7	39	*37	16	11	15	20	39	53	171	171	126	101
8	39	38	17	12	15	*17	36	48	276	141	114	101
9	38	31	*26	16	16	19	34	45	400	141	110	97
10	38	32	27	21	18	20	42	53	451	*134	*103	106
11	42	39	31	23	19	20	39	66	376	136	121	103
12	42	37	25	28	20	19	42	77	308	134	119	91
13	40	31	19	17	16	19	42	77	322	134	154	84
14	40	33	20	16	18	21	46	50	318	141	156	88
15	54	31	25	15	19	22	38	53	251	151	101	90
16	50	18	24	18	17	22	45	108	*202	138	112	84
17	63	35	19	17	19	30	46	90	200	134	146	90
18	69	31	19	17	17	30	42	84	194	124	138	91
19	*61	35	25	17	17	26	*53	106	236	110	117	103
20	54	27	19	17	*19	27	69	154	315	112	119	108
21	51	34	18	17	19	*28	67	283	360	164	121	91
22	48	*31	18	17	19	30	63	260	333	141	114	119
23	46	30	19	*16	19	34	64	221	311	110	108	112
24	34	31	18	15	16	40	58	*202	248	114	103	86
25	26	29	17	17	20	40	30	168	242	*117	112	61
26	25	26	14	16	19	36	63	187	233	121	126	*72
27	22	24	18	17	16	35	58	230	248	117	128	66
28	22	14	14	18	17	34	58	245	227	124	*114	67
29	23	9.0	15	19	-	34	60	337	194	134	108	75
30	29	15	18	17	-----	35	67	315	208	141	99	49
31	33	-----	17	18	-----	35	-----	273	-----	202	103	-----
Total	1,282	925.0	638	507	491	808	1,460	4,154	8,691	4,574	3,669	2,767
Mean	41.4	30.8	20.6	16.4	17.5	26.1	48.7	134	290	148	118	92.2
Ac-ft	2,540	1,830	1,270	1,010	974	1,600	2,900	8,240	17,240	9,070	7,280	5,490

Calendar year 1960: Max 341 Min 9.0 Mean 67.7 Ac-ft 49,160  
 Water year 1960-61: Max 560 Min 9.0 Mean 82.1 Ac-ft 59,440

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 28 to Mar. 8.

## PLATTE RIVER BASIN

6-7420. Little Thompson River near Berthoud, Colo.

Location.--Lat 40°15'30", long 105°12'15", in NW¼ sec.2, T.3 N., R.70 W., on left bank at mouth of canyon, 7½ miles southwest of Berthoud.

Drainage area.--101 sq mi.

Records available.--May 1929 to September 1930, April 1947 to September 1961 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 5,220 ft (from topographic map). Prior to Apr. 22, 1947, at site a quarter of a mile upstream at different datum.

Extremes.--Maximum discharge during year, 2,380 cfs June 3 (gage height, 6.55 ft); minimum not determined.  
1929-30, 1947-61: Maximum discharge, 4,000 cfs May 9, 1957; maximum gage height, 9.3 ft June 6, 1949, from floodmark; no flow at times in 1948-49, 1951, 1953-55.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. One small diversion above station. Inflow from Colorado-Big Thompson project above station from May 16, 1953, to Apr. 25, 1957.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 13 to Apr. 20)

Oct. 1 to June 10                      June 11 to Sept. 30

1.4	1.8	2.4	84	2.0	2.7
1.5	4.5	2.8	145	2.1	8.0
1.6	8.0	3.2	225	2.3	22
1.7	14	3.6	320	2.6	53
1.9	28	4.1	500	2.9	97
2.1	47	4.6	730	3.2	155

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						4.5	2.0	3.9	7.0	2.1	1.0	8.0
2						5.0	2.2	4.0	2.50	2.2	9.4	6.9
3	0.3					5.2	2.9	4.0	7.00	*1.8	8.0	1.0
4						5.4	3.5	4.8	1.80	1.6	6.4	1.3
5						5.2	3.5	5.0	1.50	1.7	5.9	1.2
6					0.5	5.0	3.2	5.1	1.20	*1.8	5.4	1.2
7						5.0	3.0	*4.9	1.00	2.2	4.3	*1.1
8	.5					5.0	2.9	4.8	1.10	3.8	4.8	8.7
9						5.2	2.7	*4.5	1.20	5.1	*5.4	7.5
10						5.4	3.0	4.4	1.20	2.6	5.4	6.4
11						5.0	*3.2	4.2	1.10	2.2	*7.5	6.4
12				(*)		4.6	3.3	4.1	1.00	2.4	7.5	5.9
13					(*)	4.5	3.5	8.1	9.4	2.1	8.7	5.9
14						4.2	3.5	1.12	9.6	1.8	1.2	5.9
15						2.6	3.2	1.85	*9.8	1.6	1.5	5.9
16		0.6	0.8	0.8		4.0	3.2	2.72	8.3	1.7	1.4	5.4
17						5.0	3.1	2.75	6.6	*1.4	2.4	5.4
18						8.0	3.1	2.50	5.8	1.1	2.7	*5.4
19		(*)				1.0	3.2	2.21	7.6	1.0	1.9	6.9
20	(*)				.9	1.2	3.7	2.09	7.7	8.7	1.6	2.2
21	.7					1.3	4.2	2.09	5.3	1.7	1.3	1.4
22						1.5	4.2	1.73	4.3	2.0	1.2	2.1
23						1.5	4.2	*1.53	4.0	1.5	9.4	7.0
24						1.5	4.1	1.33	3.8	1.0	8.7	1.51
25						2.1	4.1	1.28	3.6	8.0	8.0	1.08
26						1.9	4.2	1.22	3.2	6.9	8.0	7.7
27						1.9	4.0	1.02	3.0	6.9	8.0	6.0
28						2.0	3.9	9.0	2.6	6.9	8.0	5.4
29						1.7	3.8	8.5	2.5	6.4	6.9	4.8
30						*1.7	3.9	8.4	2.1	6.4	6.9	5.1
31						1.9		7.4		*8.0	8.7	
Total	18.7	18.0	24.8	24.8	16.2	300.8	1.025	3.495	3.122	522.2	313.3	824.6
Mean	0.60	0.6	0.8	0.8	0.58	9.70	34.2	113	104	16.8	10.1	27.5
Ac-ft	37	36	49	49	32	597	2,030	6,930	6,190	1,040	621	1,640

Calendar year 1960: Max 136 Min - Mean 8.19 Ac-ft 5,950  
Water year 1960-61: Max 700 Min - Mean 26.6 Ac-ft 19,250

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-17	4a.m.	3.53	302	7-8	9:30p.m.	3.64	255
6-2	3:30p.m.	4.62	742	8-17	7p.m.	3.12	135
6-3	4p.m.	6.55	2,380	9-24	6a.m.	3.42	198
6-19	8p.m.	3.42	198				

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1 to Mar. 12, Mar. 16-24, June 2-15.

## Reservoirs in South Platte River basin

- 6-6955. Elevenmile Canyon Reservoir near Lake George.--Lat  $38^{\circ}54'19''$ , long  $105^{\circ}28'30''$ , in  $N\frac{1}{2}SW\frac{1}{4}$  sec.20, T.13 S., R.72 W., at north end of dam on South Platte River, 8 miles southwest of Lake George. Records available, October 1932 to September 1961. Prior to September 1938, published in WSP 1310. Staff gage read twice daily. Datum of gage is at mean sea level (datum of Denver Board of Water Commissioners). Maximum contents observed during year, 99,560 acre-ft Aug. 1 (elevation, 8,597.52 ft); minimum observed, 97,010 acre-ft Oct. 14 (elevation, 8,596.77 ft). Maximum contents observed during period 1932-60, 103,400 acre-ft Mar. 29, 1960 (elevation, 8,598.62 ft); no contents at times in 1935.
- Reservoir is formed by concrete arch dam completed by Denver Board of Water Commissioners in November 1932. Spillway built 5.00 ft higher Aug. 1, 1957. Storage began in October 1932. Capacity, 97,780 acre-ft between elevations 8,488.25 (invert of outlet pipe) and 8,597.00 ft (crest of spillway). Dead storage is negligible. Records given herein represent total contents. Water is for municipal use by city of Denver. Records furnished by Denver Board of Water Commissioners.
- 6-7010. Cheesman Lake near Deckers.--Lat  $39^{\circ}12'26''$ , long  $105^{\circ}16'18''$ , in  $NW\frac{1}{4}SW\frac{1}{4}$  sec.6, T.10 S., R.70 W., at dam on South Platte River, 4 miles southwest of Deckers. Records available, September 1900 to December 1901, September 1902 to September 1961. Prior to October 1938, published in WSP 1310. Staff gage read twice daily. Datum of gage is 6,622.91 ft above mean sea level (datum of Denver Board of Water Commissioners). Maximum contents observed during year, 77,240 acre-ft Sept. 30 (gage height, 209.90 ft); minimum observed, 56,250 acre-ft Mar. 24, 25 (gage height, 183.15 ft). Maximum contents observed during 1900-1901, 1902-61, 80,820 acre-ft June 23, 1918, and June 7, 1921 (gage height, 214.00 ft); minimum observed since appreciable storage was attained, 3,650 acre-ft Apr. 20, 1933 (gage height, 55.02 ft).
- Reservoir is formed by masonry dam completed about October 1902. Capacity, 79,060 acre-ft at gage height 212 ft (spillway crest) above sill of lowest gate. No dead storage. Records given herein represent total contents. Water is for municipal use by City of Denver. Records furnished by Denver Board of Water Commissioners.
- 6-7375. Horsetooth Reservoir near Fort Collins.--Lat  $40^{\circ}36'00''$ , long  $105^{\circ}10'10''$ , in  $SW\frac{1}{4}$  sec.6, T.7 N., R.69 W., on right bank near abutment of Horsetooth Dam on tributaries of Cache la Poudre River, 5 miles west of Fort Collins. Records available, April 1951 to September 1961. Staff gage read at irregular intervals varying from 1 to 10 days. Datum of gage is 5,270.00 ft above mean sea level (levels by Bureau of Reclamation). Gage readings have been reduced to elevations above mean sea level. Maximum contents observed during year, 141,100 acre-ft June 23, 25 (elevation, 5,428.75 ft); minimum observed, 50,940 acre-ft Oct. 1 (elevation, 5,368.75 ft). Maximum contents observed during period 1951-61, that of June 23, 25, 1961; minimum observed, 3,040 acre-ft Sept. 23, 1954 (elevation, 5,302.20 ft); no storage prior to Apr. 18, 1951.
- Reservoir is formed by earth- and rock-fill dike and dams closing openings in a subsequent valley between hogbacks. Dams completed July 21, 1949; storage began Jan. 10, 1951; dead storage pools filled Apr. 18, 1951. Usable capacity, 143,500 acre-ft above elevations 5,320 ft (invert of channel from Spring Canyon Dam), 5,310 ft (invert of channel from Dixon Canyon Dam), 5,270 ft (trashrack sill of outlet at Soldier Canyon Dam), and below maximum water surface elevation 5,430 ft (6 ft below crest of Satanka Dike). Dead storage, 8,270 acre-ft. Reservoir is used for storage of water diverted from Colorado River basin through Alva B. Adams tunnel for supplemental irrigation supply to Cache la Poudre River basin as part of the Colorado-Big Thompson project. Figures given herein represent usable contents. Records furnished by Bureau of Reclamation.
- 6-7425. Carter Lake near Berthoud.--Lat  $40^{\circ}19'30''$ , long  $105^{\circ}12'45''$ , in  $SE\frac{1}{4}$  sec.10, T.4 N., R.70 W., in hoist house 293 ft from right abutment of Carter Lake Dam on Dry Creek, 7 miles west of Berthoud, and 8 miles upstream from mouth. Records available, March 1954 to September 1961. Electric tape gage read at irregular intervals varying from 1 to 13 days. Datum of gage is 5,618.00 ft above mean sea level (levels by Bureau of Reclamation). Gage readings have been reduced to elevations above mean sea level. Maximum contents observed during year, 106,500 acre-ft June 20 (elevation, 5,756.85 ft); minimum observed, 16,990 acre-ft Oct. 3 (elevation, 5,657.35 ft). Maximum contents observed during period 1954-61, that of June 20, 1961; minimum observed since appreciable storage was attained, 960 acre-ft Oct. 25, 1954 (elevation, 5,621.40 ft).
- Reservoir is formed by earth- and rock-fill dam and dikes enlarging the natural basin of Carter Lake. Storage began in February 1954 and dead storage pool was filled Mar. 5, 1954. Usable capacity, 113,500 acre-ft between elevations 5,618.00 (trashrack sill at Carter Lake Dam outlet) and 5,763.00 ft (maximum water surface, 6 ft below crest of dam). Dead storage, 3,310 acre-ft. Water diverted from Colorado River basin through Alva B. Adams tunnel is pumped from Platiron Reservoir into Carter Lake for supplemental irrigation supply to Little Thompson River, St. Vrain Creek, and Boulder Creek basins. Water above elevation 5,620 ft may be released for return to Platiron Reservoir where pump turbines can operate in reverse to generate power and water can be used for irrigation in Big Thompson or Cache la Poudre River basins. It is part of the Colorado-Big Thompson project. Figures given herein represent usable contents. Records furnished by Bureau of Reclamation.



## PLATTE RIVER BASIN

## Reservoirs in South Platte River basin--Continued

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)	Gage height (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Elevenmile Canyon Reservoir			Cheesman Lake			
Sept. 30.....	8,596.81	97,140	-	187.06	59,070	-
Oct. 31.....	8,597.00	97,780	+640	185.57	57,990	-1,080
Nov. 30.....	8,597.05	97,950	+170	186.10	58,370	+380
Dec. 31.....	8,597.21	98,500	+550	187.33	59,270	+900
Calendar year 1960...	-	-	+30	-	-	+700
Jan. 31.....	8,597.10	98,120	-380	189.62	60,960	+1,690
Feb. 28.....	8,597.17	98,360	+240	187.92	57,700	-3,260
Mar. 31.....	8,597.09	98,090	-270	183.72	56,660	-1,040
Apr. 30.....	8,597.08	98,050	-40	193.46	63,860	+7,200
May 31.....	8,597.00	97,780	-270	196.08	65,890	+2,030
June 30.....	8,597.25	98,640	+860	199.13	68,300	+2,410
July 31.....	8,597.09	98,090	-550	186.98	59,010	-9,290
Aug. 31.....	8,596.93	97,540	-550	186.58	58,720	-290
Sept. 30.....	8,597.08	98,050	+510	209.90	77,240	+18,520
Water year 1960-61...	-	-	+910	-	-	+18,170
Horsetooth Reservoir			Carter Lake			
Sept. 30.....	5,368.35	50,480	-	5,657.47	17,060	-
Oct. 31.....	5,373.00	55,930	+5,450	5,671.98	26,600	+9,540
Nov. 30.....	5,381.00	65,910	+9,980	5,690.40	40,740	+14,140
Dec. 31.....	5,390.23	78,310	+12,400	5,703.41	51,970	+11,230
Calendar year 1960...	-	-	+8,610	-	-	-210
Jan. 31.....	5,397.75	89,160	+10,850	5,715.60	63,200	+11,230
Feb. 28.....	5,404.05	98,760	+9,600	5,726.68	74,100	+10,900
Mar. 31.....	5,412.35	112,200	+13,440	5,737.82	85,620	+11,520
Apr. 30.....	5,416.70	119,500	+7,300	5,746.00	94,400	+8,780
May 31.....	5,425.85	133,900	+14,400	5,748.45	97,080	+2,680
June 30.....	5,428.70	141,000	+7,100	5,756.56	106,100	+9,020
July 31.....	5,422.30	129,300	-11,700	5,741.23	89,240	-16,860
Aug. 31.....	5,408.50	105,800	-23,500	5,720.23	67,680	-21,560
Sept. 30.....	5,400.30	93,140	-12,660	5,706.16	54,390	-13,290
Water year 1960-61...	-	-	+42,660	-	-	+37,330

† Elevation or gage height at 5 p.m.

6-7440. Big Thompson River at mouth, near La Salle, Colo.

Location.--Lat 40°21'00", long 104°47'04", in SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 33, T.5 N., R.66 W., on left bank just southeast of gage on Evans Town ditch, 0.7 mile upstream from highway bridge, 1.6 miles upstream from mouth, and 4 miles west of La Salle.

Drainage area.--828 sq mi.

Records available.--April 1914 to October 1915, March 1927 to September 1961. Prior to October 1933 monthly discharge only, published in WSP 1310. Published as Thompson River at mouth, near La Salle 1934-47.

Gage.--Water-stage recorder. Altitude of gage is 4,680 ft (from topographic map). Apr. 1, 1914, to Oct. 31, 1915, staff gage and Mar. 1, 1927, to Sept. 30, 1951, water-stage recorder, at bridge 0.7 mile downstream at different datums.

Extremes.--Maximum discharge during year, 2,050 cfs June 4 (gage height, 6.68 ft); minimum daily, 10 cfs May 11. 1914-15, 1927-61: Maximum discharge, 6,100 cfs Aug. 4, 1951 (gage height, 7.80 ft, site and datum then in use), from rating curve extended above 4,500 cfs; maximum gage height, 8.22 ft May 9, 1957; no flow at times in 1934-35, 1948.

Remarks.--Records good. Discharge measurements generally made three or more times a month. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, diversions for irrigation of about 95,000 acres above station, and return flow from irrigated areas.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 22 to Nov. 20)

Oct. 1 to Nov. 20		Nov. 21 to Sept. 30	
0.5	35	0.1	10
1.0	94	.5	51
1.5	167	1.0	113
		1.5	189
		2.0	287
		3.0	542
		5.0	1,300
		6.5	1,970

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	102	79	74	59	51	77	22	274	83	257	70
2	47	102	81	70	56	51	75	21	274	90	141	64
3	49	103	77	70	56	55	71	21	1,160	75	154	91
4	49	103	94	73	53	57	69	35	1,780	65	100	112
5	45	100	94	65	51	53	68	22	1,380	61	65	112
6	51	103	79	70	50	53	67	15	1,050	68	59	110
7	44	106	80	71	51	52	67	13	1,120	73	52	108
8	43	103	82	69	50	53	64	13	1,060	109	50	100
9	46	102	81	70	52	57	67	12	1,090	95	44	88
10	44	97	85	70	53	55	62	15	1,080	100	45	85
11	46	95	83	69	56	57	63	10	1,070	91	46	79
12	53	94	82	69	56	58	57	11	920	86	46	58
13	59	91	79	69	53	56	57	125	760	68	46	63
14	70	90	80	68	55	56	55	382	694	53	46	68
15	90	88	80	70	55	55	51	252	603	63	52	64
16	90	84	75	70	56	55	53	165	524	73	51	69
17	90	84	75	69	58	56	52	144	451	59	64	65
18	110	86	79	67	55	68	51	149	438	51	83	69
19	145	88	79	64	51	70	49	228	361	52	79	87
20	117	85	82	68	57	69	46	216	527	55	68	165
21	106	86	85	65	55	65	46	283	542	80	58	120
22	113	85	83	70	52	62	44	230	504	95	56	109
23	106	85	85	67	52	59	41	194	464	74	108	178
24	104	86	83	65	48	58	40	187	402	57	117	216
25	102	86	83	59	52	58	37	159	361	53	125	218
26	99	85	83	53	50	58	35	165	289	53	128	176
27	100	83	81	43	51	61	31	152	181	50	122	168
28	97	79	81	48	51	74	29	140	109	51	113	167
29	94	81	75	50	-	74	21	134	73	49	109	175
30	97	83	79	52	-----	71	23	476	77	49	109	191
31	93	-----	77	55	-----	74	-----	459	-----	58	86	-----
Total	2,459	2,745	2,522	2,012	1,494	1,851	1,569	4,450	19,618	2,139	2,680	3,445
Mean	79.3	91.5	81.4	64.9	53.4	59.7	52.3	144	654	69.0	86.5	115
Ac-ft	4,880	5,440	5,000	3,990	2,960	3,670	3,110	8,830	38,910	4,240	5,320	6,830

Calendar year 1960: Max 231 Min 2.4 Mean 61.0 Ac-ft 44,240  
Water year 1960-61: Max 1,780 Min 10 Mean 129 Ac-ft 93,180

## PLATTE RIVER BASIN

6-7475. Cache la Poudre River near Rustic, Colo.

Location.--Lat 40°41'45", long 105°41'10", in SE $\frac{1}{4}$  sec. 33, T.9 N., R.74 W., on right bank 20 ft downstream from trail bridge, 100 ft downstream from unnamed tributary, 500 ft south of State Highway 14, 5.8 miles west of Rustic, 8 $\frac{1}{2}$  miles downstream from outlet of Laramie-Poudre tunnel, and 33 miles west of Fort Collins.

Drainage area.--199 sq mi.

Records available.--August 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,610 ft (from topographic map).

Average discharge.--5 years, 269 cfs (194,700 acre-ft per year).

Extremes.--Maximum discharge during year, 2,000 cfs June 10 (gage height, 5.66 ft); minimum not determined.  
1956-61: Maximum discharge, 3,610 cfs June 29, 1957 (gage height, 7.12 ft); minimum daily, 11 cfs Feb. 2, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by transbasin and transmountain diversions (see elsewhere in this report), storage reservoirs, and a few small diversions for irrigation.

Rating table, water year, 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 29 to June 1)

1.6	12	2.5	98	4.0	620
1.7	16	2.8	168	4.5	920
1.8	22	3.1	256	5.0	1,280
2.0	36	3.5	390	6.0	2,320
2.2	54				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	20	18				13	26	1,350	948	348	268
2	38	23	18				14	30	1,260	748	320	259
3	36	24	19				15	42	1,070	682	280	280
4	34	26	19				16	45	850	*660	256	286
5	34	24	17				15	43	796	724	247	293
6	32	21	16				14	*121	796	700	277	*330
7	32	26	16				13	87	1,040	655	303	317
8	30	23	15				13	47	1,220	600	*293	313
9	30	18	15				12	52	*1,530	535	293	310
10	34	19	16				*12	69	1,890	493	286	313
11	34	22	16			(*)	12	147	1,640	457	283	289
12	34	20	17	(*)	(*)		12	268	1,480	448	289	265
13	34	21	17				12	334	1,340	390	320	256
14	37	21	18				13	226	1,300	376	303	250
15	37	21	17				13	220	1,290	372	277	247
16	37	20	17	18	15	13	12	185	1,240	355	280	244
17	44	17	18				12	142	1,240	352	414	250
18	*44	*19	19				14	174	1,170	344	362	250
19	31	20	19				20	214	1,140	330	324	262
20	27	17	18				27	306	1,220	306	289	277
21	27	18	18				23	386	1,260	372	293	289
22	25	19	19				21	488	1,210	372	286	277
23	26	20	20				24	570	1,100	310	283	127
24	26	21	21				23	550	1,020	262	283	116
25	26	22	21				20	550	1,020	247	306	100
26	24	18	21				19	625	1,020	253	310	116
27	24	17	20				20	766	983	274	303	113
28	24	17	20				18	871	990	313	313	124
29	23	14	21				20	1,070	955	271	271	183
30	16	17	22				24	1,360	941	280	259	122
31	14	-----	23				-----	*1,310	-----	286	268	-----
Total	956	605	571	558	420	403	496	11,324	35,361	13,715	9,219	7,136
Mean	30.8	20.2	18.4	18	15	13	16.5	365	1,179	442	297	238
Ac-ft	1,900	1,200	1,130	1,110	833	799	984	22,460	70,140	27,200	18,290	14,130

Calendar year 1960: Max 1,800 Min 14 Mean 267 Ac-ft 193,600

Water year 1960-61: Max 1,890 Min - Mean 221 Ac-ft 160,200

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 1, 9-14, 16-18, 20, 21, 23, Nov. 29 to Dec. 2, Dec. 5 to Jan. 21. No gage-height record Jan. 22 to Apr. 3 (stage-discharge relation affected by ice during most of period).

## PLATTE RIVER BASIN

49

6-7482. Fall Creek near Rustic, Colo.

Location.--Lat 40°33'06", long 105°37'35", in NW¼ sec.30, at line of sec.19, T.7 N., R.73 W., on left bank on upstream side of bridge, 1.5 miles upstream from mouth, 11 miles southwest of Rustic, and 29 miles west of Fort Collins.

Drainage area.--3.64 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,765 ft (from topographic map).

Extremes.--Maximum discharge during year, 48 cfs June 8 (gage height, 2.35 ft); minimum daily, 0.3 cfs Mar. 22.

Remarks.--Records excellent except those for period of ice effect, which are fair. No diversion above station.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	0.3	1.1	5.7
.5	.6	1.4	11
.6	1.0	1.7	17
.8	2.1	2.0	30
.9	3.0	2.3	45

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	1.2	0.9	0.6	0.5	0.4	0.4	1.7	*31	26	17	7.3
2	2.6	1.2	.9	.8	.5	.4	.4	2.0	26	24	15	7.5
3	2.6	1.2	.9	.8	.5	.4	.5	2.5	23	*21	13	8.0
4	2.6	1.2	.9	.8	.5	.4	.5	2.0	19	20	12	8.0
5	2.5	1.2	.9	.8	.5	.4	.5	1.6	18	22	11	8.5
6	2.4	1.2	.9	.8	.5	.4	.5	1.3	18	20	10	*9.0
7	2.3	1.2	.9	.8	.5	.4	.5	1.0	25	19	*10	9.2
8	2.3	1.3	.9	.9	.5	.4	.5	1.0	*36	19	10	8.8
9	2.3	1.3	.9	.9	.5	.4	.5	1.7	36	18	10	9.0
10	2.3	1.3	.9	.9	.5	.4	.5	3.5	35	16	9.5	8.7
11	2.2	1.3	.8	.9	.5	.4	.5	5.4	33	16	9.2	8.2
12	2.2	1.3	.8	1.0	.5	.4	.5	7.6	34	14	14	7.6
13	2.1	1.3	.8	1.0	.5	.4	.5	5.7	32	13	16	7.3
14	2.1	1.3	.8	1.0	.5	*.4	.5	3.0	*32	13	14	7.0
15	2.1	1.3	.8	.9	.5	.4	.5	2.9	29	12	12	6.8
16	3.0	*1.4	.8	.9	.5	.4	.5	2.8	28	12	12	6.7
17	4.4	1.4	.8	*.9	.5	.4	.5	3.3	30	12	14	6.5
18	4.4	1.4	.8	.9	.5	.4	*.6	3.5	30	12	13	6.7
19	4.2	1.3	.8	.8	.5	.4	.8	4.9	30	11	12	7.1
20	4.4	1.1	.6	.7	.5	.4	.8	6.0	34	11	11	7.6
21	2.7	1.0	.6	.6	.5	.4	.6	6.8	35	14	10	8.2
22	2.0	1.0	.6	.6	.5	.3	.6	11	35	12	9.9	8.5
23	2.4	1.0	.6	.6	.5	.4	.7	*12	31	11	9.2	8.3
24	2.4	1.0	.6	.6	.4	.4	.5	10	30	9.9	9.9	7.3
25	2.4	1.0	.6	.6	.4	.4	.5	9.9	28	9.7	9.5	8.3
26	2.0	1.0	.6	.6	.4	.4	.4	11	*24	9.4	9.0	8.0
27	2.0	1.0	.6	.6	.4	.4	.4	14	24	9.7	8.5	7.1
28	1.6	1.0	.6	.6	.4	.4	.5	18	27	10	8.2	8.0
29	1.5	1.0	.6	.6	-	.4	.8	27	29	12	8.0	8.7
30	1.2	1.0	.6	.6	-----	.4	1.4	31	29	15	8.0	8.2
31	1.5	-----	.6	.6	-----	.4	-----	30	-----	15	8.0	-----
Total	77.3	35.4	23.4	23.7	13.5	12.3	16.9	244.1	871	458.7	342.9	236.1
Mean	2.49	1.18	0.75	0.76	0.48	0.40	0.56	7.87	29.0	14.8	11.1	7.87
Ac-ft	153	70	46	47	27	24	34	484	1,730	910	680	468

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 36 Min 0.3 Mean 6.45 Ac-ft 4,670

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 25 to Jan. 1.



## PLATTE RIVER BASIN

6-7485.1 Little Beaver Creek near Idylwilde, Colo.

Location.--Lat 40°38'20", long 105°39'40", in NW $\frac{1}{4}$  sec.26, T.8 N., R.74 W., on left bank 4.5 miles south of Idylwilde and 8 miles upstream from mouth.

Drainage area.--0.89 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder and Parshall flume or V-notch sharp-crested weir. Altitude of gage is 10,000 ft (from topographic map).

Extremes.--Maximum discharge during year, 14 cfs June 21 (gage height, 0.91 ft); minimum daily, 0.01 cfs Apr. 25 to May 14.

Remarks.--Records excellent except those for periods of no gage-height record, which are fair.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 18,  
Aug. 8 to Sept. 30

Apr. 19 to Aug. 7

0.6	0	0	0
.7	.04	.1	.39
.8	.11	.2	1.3
.9	.23	.3	2.4
1.0	.41	.4	3.8
1.1	.66	.5	5.4
1.2	.97	.7	9.1
1.3	1.4	.8	11

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.23	0.19	0.12	0.10	0.05	0.04	0.02	a 0.01	3.9	6.4	1.7	0.63
2	.23	.19	.12	.10	.05	.05	.02	a.01	4.2	6.0	1.6	.60
3	.23	*.19	.12	.10	.05	.05	.02	a.01	3.5	5.4	1.5	.60
4	.22	.16	.12	.10	.05	.05	.03	a.01	3.3	*5.1	a1.5	.60
5	.22	.15	.12	.10	.05	.05	.03	a.02	3.5	4.7	a1.4	.66
6	.22	.15	.12	.10	.05	.05	.03	a.02	4.2	4.1	a1.3	.71
7	.22	.14	.11	.09	.05	.05	.03	a.02	5.9	3.9	*a1.0	.77
8	.20	.14	.11	.09	.05	.04	.03	a.02	*7.9	3.6	1.0	.74
9	.20	.13	.11	.09	.05	.04	.03	a.02	8.5	3.5	1.0	.71
10	.20	.12	.11	.09	.05	.04	.03	a.02	8.7	3.2	.97	.66
11	.20	.12	.11	.09	.06	.04	.03	a.03	8.3	3.2	.94	.58
12	.20	.12	.11	.09	.06	.04	.03	.03	9.1	2.8	1.1	.52
13	.20	.12	.11	.09	.06	.03	.03	.03	10	2.6	1.0	.52
14	.19	.12	.11	.09	.06	.03	.03	.03	*9.2	2.4	.97	.52
15	.18	.12	.10	.09	.06	.03	.02	.03	8.3	2.3	.90	.52
16	.19	.12	.10	.09	.06	.03	.02	.03	8.5	2.2	.90	.52
17	.20	*.13	.10	.08	.06	.03	.02	.03	9.1	1.9	.97	.52
18	.20	.14	.10	*.08	.05	.03	.03	.03	9.3	1.7	.84	.55
19	*.19	.14	.10	.07	.05	.03	.03	.03	9.5	1.7	.77	.58
20	.20	.13	.10	.07	.05	.03	.03	.06	9.7	1.6	.74	.58
21	.19	.13	.10	.06	.05	.03	.03	.11	11	2.0	.74	.58
22	.19	.13	.10	.06	.04	.02	a.03	.11	11	1.8	.71	.63
23	.19	.13	.10	.05	.04	.02	a.02	.17	8.7	1.6	.68	.58
24	.19	.13	.10	.05	.04	.02	a.02	.24	8.9	1.5	.68	.55
25	.19	.13	.10	.05	.04	.02	a.01	.24	8.7	1.4	.71	.52
26	.19	.13	.10	.05	.04	.02	a.01	.31	7.5	1.4	.68	.52
27	.19	.13	.10	.05	.04	.02	a.01	.63	*7.9	1.5	.66	.52
28	.19	.13	.10	.05	.04	.02	a.01	.80	7.3	1.5	.66	.55
29	.19	.13	.10	.05	-	.02	a.01	1.4	7.2	1.5	.66	.58
30	.18	.12	.10	.05	-----	.02	a.01	2.5	7.3	1.8	.66	.55
31	.18	-----	.10	.05	-----	.02	-----	*3.6	-----	1.9	.66	-----
Total	6.19	4.11	3.30	2.37	1.40	1.01	0.70	10.60	230.1	86.2	29.60	17.67
Mean	0.200	0.137	0.106	0.076	0.050	0.033	0.023	0.342	7.67	2.78	0.955	0.589
Ac-ft	12	8.2	6.5	4.7	2.8	2.0	1.4	21	456	171	59	35

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 11 Min 0.01 Mean 1.08 Ac-ft 780

\* Discharge measurement made on this day.  
 a No gage-height record.

## PLATTE RIVER BASIN

51

6-7485.3 Little Beaver Creek near Rustic, Colo.

Location.--Lat 40°37'23", long 105°33'52", in N½ sec.34, T.8 N., R.73 W., on left bank 2.6 miles upstream from mouth and 5.5 miles south of Rustic.

Drainage area.--11.4 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 8,350 ft (from topographic map).

Extremes.--Maximum discharge during year, 92 cfs June 9 (gage height, 1.55 ft); minimum daily, 1.0 cfs Mar. 3-12.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. No diversion above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.6	0.7	10
.3	1.4	.9	21
.4	2.9	1.1	37
.5	4.8	1.3	58
.6	7.0	1.5	85

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	b1.7	1.4	1.4	1.7	1.1	1.2	3.3	5.4	3.1	1.4	3.5
2	1.8	2.0	1.4	1.4	1.8	1.1	1.2	3.7	5.9	2.7	1.1	3.3
3	1.8	2.2	1.4	1.2	1.6	1.0	1.6	3.7	6.3	*2.6	8.8	4.2
4	2.0	*2.2	1.4	1.2	1.3	1.0	1.7	3.3	6.1	2.5	7.9	4.2
5	2.0	2.2	1.6	1.2	1.3	1.0	1.6	3.1	6.3	2.4	7.6	5.2
6	2.0	2.2	1.6	1.2	1.3	1.0	2.2	2.9	5.6	2.2	6.8	5.5
7	2.0	2.2	1.6	1.2	1.2	1.0	1.2	2.8	6.1	2.1	*6.1	5.2
8	1.8	2.0	1.6	1.2	1.2	1.0	1.2	2.8	*6.2	1.9	5.9	5.0
9	1.8	1.8	1.4	1.2	1.2	1.0	1.2	3.7	6.6	1.8	5.9	4.6
10	1.8	2.0	1.4	1.3	1.2	1.0	1.2	5.2	7.9	1.7	5.5	4.0
11	1.7	2.2	1.4	1.3	1.2	1.0	1.2	7.0	7.7	1.7	5.2	3.5
12	1.7	2.0	1.4	1.3	1.2	1.0	1.2	7.3	7.2	1.6	5.7	3.3
13	1.7	1.8	1.4	1.3	1.2	*1.1	1.2	5.0	6.3	1.5	6.3	3.1
14	1.8	1.8	1.4	1.3	1.2	1.2	b1.2	6.8	*6.3	1.5	6.3	3.3
15	1.8	1.8	1.4	1.3	*1.1	1.2	1.2	7.0	6.1	1.4	5.2	3.4
16	2.0	*1.8	1.4	1.3	1.1	1.2	1.6	7.6	5.6	1.3	5.0	3.1
17	2.2	1.7	1.4	1.2	1.1	1.2	*1.7	8.8	5.6	1.2	5.7	3.1
18	2.2	1.7	1.4	1.2	1.1	1.2	2.0	1.2	5.6	1.1	4.8	3.5
19	2.0	1.7	1.4	1.2	1.1	1.2	2.9	1.9	5.6	1.0	4.6	4.2
20	2.0	1.7	1.4	1.2	1.1	1.1	3.1	2.7	6.1	1.0	4.2	4.2
21	2.0	1.6	1.4	1.2	1.1	1.2	2.4	3.3	5.9	1.6	4.2	4.6
22	2.0	1.6	1.4	1.2	1.1	1.2	2.6	*3.2	5.8	1.3	4.0	5.2
23	1.8	1.4	1.4	1.2	1.1	1.2	2.4	3.2	5.0	1.0	3.8	5.0
24	1.8	1.4	1.4	1.2	1.1	1.2	1.8	3.1	4.9	9.4	4.2	4.8
25	1.8	1.4	1.4	1.2	1.1	1.2	2.0	3.2	4.6	9.1	4.4	4.6
26	1.8	1.4	1.4	1.2	1.1	1.2	2.2	3.2	*3.9	9.1	4.2	4.8
27	2.0	1.4	1.4	1.2	1.1	1.2	2.2	3.4	3.9	9.1	3.7	4.8
28	2.0	1.4	1.4	1.2	1.1	1.2	2.3	3.6	3.6	1.0	3.5	5.0
29	1.7	1.4	1.4	1.2	-	1.2	2.8	3.7	3.4	9.4	3.3	6.1
30	b1.6	1.4	1.4	1.2	-----	1.2	3.5	4.8	3.3	1.0	3.5	5.5
31	b1.5	-----	1.4	1.2	-----	1.2	-----	5.4	-----	1.2	3.5	-----
Total	57.9	53.1	44.2	38.3	34.0	34.8	55.8	54.3	169.2	480.1	174.8	129.5
Mean	1.87	1.77	1.43	1.24	1.21	1.12	1.86	17.5	56.4	15.5	5.64	4.32
Ac-ft	115	105	88	76	67	69	111	1,080	3,360	952	347	257

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 79 Min 1.0 Mean 9.14 Ac-ft 6,630

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 17-20, Jan. 3-18, Apr. 15-17.

## PLATTE RIVER BASIN

6-7486, South Fork Cache la Poudre River near Rustic, Colo.

Location.--Lat 40°38'30", long 105°29'30", in SW $\frac{1}{4}$  sec.20, T.8 N., R.72 W., on left bank 5.7 miles upstream from mouth, 6 miles southeast of Rustic, and 22 miles west of Fort Collins.

Drainage area.--90.3 sq mi.

Records available.--August 1956 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 7,596.86 ft above mean sea level (Bureau of Reclamation bench mark).

Average discharge.--5 years, 69.5 cfs (50,320 acre-ft per year).

Extremes.--Maximum discharge during year, 538 cfs June 12 (gage height, 3.76 ft); minimum not determined.  
1956-61: Maximum discharge, 1,120 cfs June 29, 1957 (gage height, 4.70 ft); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.  
Slight regulation by small reservoirs and lakes.

Rating table, water year 1960-61, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	10	2.7	123
1.8	13	3.1	230
1.9	19	3.5	405
2.1	35	3.8	560
2.3	60		

Discharge, in cubic feet per second, water year October 1960 to September 1961																						
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.										
1	14						10	23	*445	221	140	51										
2	12											11	24	500	209	125	51					
3	12											11	28	465	*200	109	59					
4	12											12	27	405	200	105	52					
5	12											12	25	365	215	112	56					
6	12						11	*22	346	209	109	*57										
7	12											11	22	328	203	105	56					
8	12											10	22	*400	188	*105	59					
9	11											10	22	445	182	100	59					
10	12											10	29	460	170	91	77					
11	12																					
12	12																					
13	12																					
14	14																					
15	13																					
16	14	11		10		8		8														
17	15																					
18	*17																					
19	15																					
20	13																					
21	12						15	194	415	110	70	52										
22	11											15	197	420	97	68	64					
23	11											17	203	395	83	64	60					
24	11											13	194	365	82	64	55					
25	11											14	200	337	84	70	56					
26	10						12	197	301	83	64	57										
27	10											13	209	265	88	60	58					
28	10											13	254	254	97	57	60					
29	10											16	314	213	99	55	60					
30	9											20	380	234	118	54	60					
31	8	-----			-----		-----	410	-----	123	54	-----										
Total	371	330	310	310	224	248	377	3835	11888	4166	2549	2010										
Mean	12.0	11	10	10	8	8	12.6	124	396	134	82.2	67.0										
Ac-ft	736	655	615	615	444	492	748	7,610	23,580	8,260	5,060	3,990										

Calendar year 1960: Max 360 Min - Mean 51.3 Ac-ft 37,230

Water year 1960-61: Max 500 Min - Mean 72.9 Ac-ft 52,800

Peak discharge (base, 250 cfs)--June 2 (10 p.m.) 532 cfs (3.75 ft); June 12 (11:50 p.m.) 538 cfs (3.76 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 18 to Dec. 3, Apr. 12-15. No gage-height record Oct. 18 to Nov. 17, Dec. 4 to Apr. 11 (stage-discharge relation affected by ice during most of periods), Sept. 25-30.

Transbasin diversions from North Platte River basin to  
Cache la Poudre River basin in Colorado

The following seven diversions, which are equipped with water-stage recorders, divert water from tributaries of the North Platte River to the Cache la Poudre River or its tributaries. Records furnished by State engineer.

6-7455. Cameron Pass ditch diverts water from tributaries of Michigan River in sec.10, T.6 N., R.76 W., to Joe Wright Creek (tributary to Cache la Poudre River) in sec.2, T.6 N., R.76 W.

6-7460. Michigan ditch diverts water from Michigan River and many small tributaries in sec.12, T.6 N., R.76 W., to Joe Wright Creek (tributary to Cache la Poudre River) in sec.2, T.6 N., R.76 W.

6-7465. Skyline ditch diverts water from West Branch Laramie River (tributary to Laramie River), headgate in sec.14, T.8 N., R.76 W., to Chambers Lake (tributary to Cache la Poudre River) in sec.31, T.8 N., R.75 W.

6-7470. Laramie-Poudre tunnel diverts water from Laramie River in sec.7, T.8 N., R.75 W., and Rawah Creek (tributary to Laramie River) in sec.14, T.9 N., R.76 W., to Cache la Poudre River in sec.9, T.8 N., R.75 W.

6-7472. Bob Creek ditch diverts water from Nunn Creek (tributary to Laramie River) in sec.9, T.9 N., R.75 W., to Roaring Creek (tributary to Cache la Poudre River) in sec.11, T.9 N., R.75 W.

6-7500. Columbine ditch diverts water from Nunn Creek (tributary to Laramie River) in sec.3, T.9 N., R.75 W., to North Fork Cache la Poudre River (tributary to Cache la Poudre River) in sec.25, T.10 N., R.75 W.

6-7505. Wilson supply ditch diverts water from Sand Creek in sec.22, T.11 N., R.75 W., and at times includes water diverted from tributaries of Deadman Creek in sec.9, T.10 N., R.75 W. Diversion is from the Laramie River basin to Sheep Creek (tributary to North Fork Cache la Poudre River) in sec.13, T.11 N., R.75 W., in the Cache la Poudre River basin. Records herein represent total flow diverted from the Laramie River basin by Wilson supply ditch.

Diversions, in acre-feet, water year October 1960 to September 1961

Month	Cameron Pass ditch	Michigan ditch	Skyline ditch	Laramie- Poudre tunnel	Bob Creek ditch	Columbine ditch	Wilson supply ditch	Total
October.....	0	0	0	0	0	0	0	0
November.....	0	0	0	0	0	0	0	0
December.....	0	0	0	0	0	0	0	0
January.....	0	0	0	0	0	0	0	0
February.....	0	0	0	0	0	0	0	0
March.....	0	0	0	0	0	0	0	0
April.....	0	0	0	0	0	0	0	0
May.....	0	0	0	198	0	0	902	1,100
June.....	0	127	353	1,320	0	0	80	1,880
July.....	0	0	952	5,610	0	0	169	6,730
August.....	0	0	0	2,860	0	0	0	2,860
September.....	0	0	0	411	0	0	0	411
Water year 1960-61.....	0	127	1,300	10,400	0	0	1,150	12,980



## PLATTE RIVER BASIN

6-7515. North Fork Cache la Poudre River near Livermore, Colo.

Location---Lat 40°42'15", long 105°14'10", in sec.33, T.9 N., R.70 W., on right bank a quarter of a mile upstream from mouth, a quarter of a mile downstream from Milton Seaman Reservoir, and 6 miles southeast of Livermore.

Drainage area---568 sq mi.

Records available---May 1929 to September 1931, May 1947 to September 1961. Published as "at Livermore" 1929-31.

Gage---Water-stage recorder. Altitude of gage is 5,380 ft (from topographic map). May 24, 1929, to Sept. 30, 1931, chain gage on highway bridge at Livermore 9 miles upstream at datum 5,715.03 ft above mean sea level, datum of 1929.

Average discharge---15 years, 45.8 cfs (33,160 acre-ft per year).

Extremes---Maximum discharge during year, 1,590 cfs May 17 (gage height, 6.78 ft); no flow Feb. 7 to Mar. 3, Mar. 10 to Apr. 9. 1929-31, 1947-61: Maximum discharge, 6,800 cfs May 31, 1930 (gage height, 9.82 ft, from floodmarks, site and datum then in use), from rating curve extended above 390 cfs on basis of slope-area measurement of peak flow; no flow Feb. 7 to Mar. 3, Mar. 10 to Apr. 9, 1961.

Maximum flood known, 20,000 cfs (estimated) May 20, 1904.

Remarks---Records good. Natural flow of stream affected by transbasin diversions (see elsewhere in this report), storage reservoirs, and diversions for irrigation.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 13

June 14 to Sept. 30

2.4	0	3.4	26	2.7	1.5	3.6	51
2.5	.1	3.7	51	2.8	2.5	3.9	90
2.6	.3	4.0	88	2.9	4.8	4.3	180
2.7	.7	4.3	150	3.1	11	4.7	320
2.8	1.7	4.6	235	3.3	22	5.2	580
2.9	3.4	5.0	400				
3.0	5.4	6.0	960				
3.2	14	6.8	1,610				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	12	3.6	10	35	0	0	104	818	170	122	8.6
2	20	12	3.4	10	51	0	0	108	824	128	204	15
3	19	12	3.4	13	36	0	0	123	860	*126	90	21
4	18	12	3.4	18	26	65	0	155	848	87	53	29
5	16	12	3.4	18	26	130	0	168	848	78	54	31
6	15	9.5	3.2	18	12	128	0	*172	812	106	49	31
7	12	7.9	3.2	18	0	123	0	168	788	114	45	*31
8	12	7.9	3.2	18	0	121	0	138	*740	59	*17	31
9	12	7.4	3.2	15	0	40	0	110	662	49	4.6	31
10	12	6.6	3.1	11	0	0	*11	92	560	61	2.0	31
11	12	6.6	3.1	11	*0	*0	50	104	540	63	9.5	31
12	12	5.8	3.1	*11	0	0	53	140	436	54	22	31
13	11	5.8	3.1	11	0	0	53	193	400	38	26	31
14	15	5.8	3.1	11	0	0	62	324	410	31	26	31
15	19	5.8	3.1	11	0	0	64	923	*445	28	26	31
16	21	5.8	3.1	11	0	0	80	1,240	550	27	29	31
17	22	5.8	2.9	11	0	0	101	1,450	388	27	40	31
18	29	*5.8	2.7	9.1	0	0	104	1,410	347	27	43	31
19	*4.2	5.8	2.0	7.9	0	0	104	1,360	347	26	43	32
20	41	5.0	2.0	7.9	0	0	112	1,330	324	15	28	41
21	32	3.8	1.9	8.3	0	0	175	1,420	308	14	9.5	48
22	32	3.8	1.9	8.3	0	0	208	1,290	300	14	14	43
23	29	3.8	1.9	8.3	0	0	202	1,210	231	30	14	43
24	21	3.8	3.2	8.3	0	0	175	1,190	189	37	14	60
25	21	3.8	10	8.3	0	0	158	1,170	183	37	14	60
26	21	3.8	10	7.9	0	0	152	*1,150	225	37	14	85
27	22	3.8	10	7.9	0	0	130	1,060	160	25	14	122
28	16	3.8	10	7.4	0	0	110	911	106	8.9	14	128
29	12	3.8	10	7.4	-	0	101	*782	172	8.9	12	155
30	12	3.8	10	7.4	-----	0	102	728	198	8.9	9.8	155
31	12	-----	10	7.4	-----	0	-----	770	-----	9.2	3.6	-----
Total	610	195.3	140.2	337.8	186	608	2307	21,494	14,019	15,439	10,660	14,796
Mean	19.7	6.51	4.52	10.9	6.64	19.6	76.9	693	467	49.8	34.4	49.3
Ac-ft	1,210	387	278	670	369	1,210	4,580	42,630	27,810	3,060	2,110	2,930

Calendar year 1960: Max 304 Min 1.8 Mean 32.7 Ac-ft 23,730

Water year 1960-61: Max 1,450 Min 0 Mean 121 Ac-ft 87,240

\* Discharge measurement or observation of no flow made on this day.

PLATTE RIVER BASIN

55

6-7520. Cache la Poudre River at mouth of canyon, near Fort Collins, Colo.

Location.--Lat 40°39'55", long 105°13'10", in sec.15, T.8 N., R.70 W., on left bank at mouth of canyon, three-quarters of a mile upstream from Lewstone Creek and 8½ miles northwest of Fort Collins.

Drainage area.--1,055 sq mi.

Records available.--June to August 1881, May to July 1883, October 1883 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Records for Mar. 23 to Apr. 30 and July 4 to Aug. 20, 1883, published in WSP 9, have been found to be unreliable and should not be used. Prior to 1902, published as Cache la Poudre Creek or River at or near Fort Collins.

Gage.--Water-stage recorder. Altitude of gage is 5,240 ft (from topographic map).

Average discharge.--78 years (1883-1961), 399 cfs (288,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,960 cfs June 10 (gage height, 5.17 ft); minimum daily, 7.8 cfs Nov. 30. 1881, 1883-1961: Maximum discharge not determined, occurred May 20, 1904; minimum daily, 1.6 cfs Nov. 20, 28, 1948, caused by diversion of Poudre Valley Canal half a mile upstream. Flood of June 9, 1891, caused by failure of Chambers Lake Dam, given in State report as 21,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Natural flow of stream affected by transbasin and transmountain diversions (see elsewhere in this report), diversions for irrigation, and diversions for municipal use.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	12	3.0	690
1.4	30	3.5	1,080
1.6	54	4.0	1,550
1.8	98	5.0	2,740
2.2	222	5.1	2,870
2.6	430		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	27	12	39	32	19	26	191	2,250	1,300	620	188
2	50	33	b17	40	55	19	28	205	2,390	1,120	711	182
3	44	37	b24	41	52	22	37	231	2,280	934	538	212
4	40	40	b23	42	47	94	51	282	2,060	846	448	227
5	40	37	b22	43	42	169	58	297	1,860	894	394	222
6	39	29	b21	44	39	159	48	297	1,850	886	327	278
7	37	35	20	44	36	159	37	418	1,950	816	332	273
8	38	37	20	43	33	150	38	282	2,160	697	332	250
9	38	28	19	41	31	69	38	227	2,450	683	338	215
10	36	18	20	40	15	25	47	215	2,800	788	321	219
11	39	30	20	38	20	21	96	263	2,660	753	231	240
12	37	40	21	37	32	18	98	430	2,360	711	227	205
13	38	35	22	35	34	14	104	718	2,190	613	297	182
14	46	31	23	38	36	16	112	718	2,120	442	306	156
15	58	27	24	38	38	22	112	1,120	2,150	430	259	175
16	53	28	25	39	40	26	129	1,410	2,100	406	236	195
17	51	18	25	40	42	28	150	1,780	2,000	370	354	185
18	73	29	24	40	35	34	153	1,800	1,920	302	382	153
19	93	39	24	41	24	27	162	1,820	1,760	268	343	156
20	86	28	25	41	22	26	191	1,880	1,860	240	263	172
21	64	21	26	42	20	26	245	2,150	1,890	278	227	96
22	58	37	27	37	18	24	268	1,930	1,950	400	219	104
23	53	22	28	33	17	23	263	1,880	1,860	287	205	126
24	48	25	29	28	15	28	245	1,780	1,650	222	208	126
25	46	32	30	25	14	30	231	1,760	1,640	172	208	120
26	41	31	32	25	13	30	227	1,740	1,510	162	219	188
27	40	b26	33	26	14	30	219	1,750	1,370	182	205	236
28	38	b20	34	27	14	31	195	1,780	1,320	208	215	215
29	33	b9	35	28	-	24	182	1,740	1,260	208	188	282
30	28	7.8	36	30	-----	24	182	2,060	1,280	208	150	316
31	24	-----	38	31	-----	27	-----	2,250	-----	292	159	-----
Total	1,510	8,568	779	1,136	830	1,414	3,972	35,404	58,900	16,118	9,462	5,894
Mean	48.7	28.6	25.1	36.6	29.6	45.6	132	1,142	1,963	520	309	196
Ac-ft	3,000	1,700	1,550	2,250	1,650	2,800	7,880	70,220	116,800	31,970	18,770	11,690

Calendar year 1960: Max 2,060 Min 5 Mean 279 Ac-ft 202,300  
Water year 1960-61: Max 2,800 Min 7.8 Mean 373 Ac-ft 270,300

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 7 to Feb. 24 (stage-discharge relation affected by ice during most of period).

## PLATTE RIVER BASIN

6-7525. Cache la Poudre River near Greeley, Colo.

Location.--Lat 40°25'04", long 104°38'22", in NW¼ sec. 11, T.5 N., R.65 W., on right bank 25 ft downstream from highway bridge, 3 miles east of courthouse in Greeley, and 3 miles upstream from mouth.

Drainage area.--1,877 sq mi.

Records available.--March to October 1903, August to November 1904, January 1914 to December 1919, June 1924 to September 1961. Monthly discharge only for some periods, published in WSP 1310.

Gage.--Water-stage recorder. Altitude of gage is 4,610 ft (from topographic map). Prior to Apr. 4, 1916, staff gage and Apr. 4, 1916, to Dec. 17, 1919, water-stage recorder, at sites within 2 miles downstream at different datums. May 27, 1924, to Dec. 13, 1933, at present site at datum 0.51 ft higher.

Average discharge.--42 years (1914-19, 1924-61) 93.5 cfs (67,690 acre-ft per year).

Extremes.--Maximum discharge during year, 2,870 cfs June 11 (gage height, 7.86 ft); minimum daily, 5.8 cfs Apr. 30. 1903-4, 1914-19, 1924-61: Maximum daily discharge, 4,220 cfs June 24, 26, 1917; minimum daily, 0.8 cfs Oct. 3, 1946.

Remarks.--Records good. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain and transbasin diversions, storage reservoirs, power developments, diversion for municipal supply, diversions above station for irrigation of about 250,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 14, 15, Apr. 20-25)

Oct. 1 to Mar. 15			Mar. 16 to Sept. 30		
2.7	28		2.2	4.0	4.0
3.0	57		2.3	7.0	5.0
3.7	148		2.5	17	6.0
			2.7	33	7.0
			3.0	75	8.0
			3.5	167	

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	108	101	75	84	75	126	6.4	1,010	84	258	52
2	32	106	97	74	76	75	119	6.7	1,060	126	339	53
3	34	102	99	82	75	78	114	12	1,700	92	157	80
4	37	101	109	83	76	79	106	18	2,230	78	119	99
5	37	100	105	76	88	79	101	23	2,400	73	72	110
6	36	101	97	76	87	76	94	18	2,220	55	35	119
7	42	102	96	79	88	75	96	22	2,100	39	25	121
8	34	106	97	78	87	70	101	21	1,970	69	46	108
9	51	102	95	82	87	75	99	11	2,020	56	59	106
10	61	102	95	83	90	78	94	6.7	2,250	105	64	181
11	67	102	93	97	90	79	90	6.7	2,670	165	46	141
12	69	102	91	100	88	80	87	7.5	2,790	295	43	89
13	67	102	91	102	86	80	82	167	2,210	157	37	77
14	80	104	90	95	87	80	77	397	1,660	134	28	80
15	83	105	88	91	88	80	72	159	1,390	128	31	89
16	102	106	83	92	86	77	65	103	1,420	117	29	132
17	105	101	86	93	82	77	67	272	1,460	90	49	87
18	125	104	88	95	80	96	64	865	1,400	56	43	61
19	130	104	88	91	78	101	64	1,140	1,270	38	46	75
20	118	101	91	86	82	101	58	1,220	952	38	45	159
21	117	105	90	86	82	96	53	1,260	840	48	84	177
22	106	100	86	80	80	94	61	1,670	754	49	78	207
23	104	100	84	79	80	90	64	1,700	654	32	32	292
24	106	99	83	80	74	87	65	1,730	358	27	23	295
25	105	99	83	79	78	87	70	1,220	220	27	21	214
26	108	95	80	73	79	90	39	952	143	24	13	202
27	108	95	83	58	78	97	15	1,030	103	25	20	173
28	106	95	80	73	73	119	6.4	1,030	59	32	19	179
29	106	102	78	75	-	115	6.4	744	38	23	23	179
30	104	104	74	73	-----	110	5.8	686	33	20	30	225
31	105	-----	75	78	-----	114	-----	900	-----	51	45	-----
Total	2,519	3,055	2,776	2,564	2,309	2,710	2,161.6	7,404.0	3,938.4	2,353	1,964	4,162
Mean	81.3	102	89.5	82.7	82.5	87.4	72.1	561	1,313	75.9	63.4	139
Ac-ft	5,000	6,060	5,510	5,090	4,580	5,380	4,290	34,320	78,120	4,670	3,900	8,260

Calendar year 1960: Max 163 Min 8.5 Mean 70.6 Ac-ft 51,220  
Water year 1960-61: Max 2,790 Min 5.8 Mean 228 Ac-ft 165,400

## PLATTE RIVER BASIN

57

6-7540. South Platte River near Kersey, Colo.

Location.--Lat 40°24'44", long 104°33'46", in NW¼SW¼ sec.9, T.5 N., R.64 W., on downstream side of bridge on State Highway 37, 1.9 miles north of railroad in Kersey, and 2½ miles downstream from Cache la Poudre River.

Drainage area.--9,598 sq mi.

Records available.--May 1901 to December 1903, March 1905 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Published as "at Kersey" 1901-3.

Gage.--Water-stage recorder since July 8, 1919. Datum of gage is 4,575.77 ft above mean sea level, datum of 1929. Prior to July 8, 1919, staff or chain gages at former bridge 150 ft downstream at different datum. July 8, 1919, to Sept. 7, 1921, at site 450 ft downstream from present site at different datum. Sept. 8, 1921, to Sept. 12, 1923, at site 750 ft downstream from present site at different datum. Sept. 13, 1923, to July 2, 1935, at site 200 ft downstream from present site at present datum.

Average discharge.--58 years, 728 cfs (527,100 acre-ft per year).

Extremes.--Maximum discharge during year, 11,200 cfs June 5 (gage height, 8.35 ft); minimum daily, 84 cfs May 12. 1901-3, 1905-61: Maximum daily discharge, 31,000 cfs June 7, 1921, from rating curve extended above 17,000 cfs by logarithmic plotting; minimum daily, 28 cfs Apr. 30, 1955.

Remarks.--Records good except those for period of no gage-height record, which are fair. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain and transbasin diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation of about 888,000 acres, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 19-26, June 26 to Aug. 2, Aug. 12 to Sept. 3, Sept. 11-19)

1.9	80	4.0	1,090
2.3	165	5.0	2,440
2.7	300	6.0	4,400
3.0	440	8.0	10,100

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	320	544	480	568	526	514	790	180	2,710	268	760	520
2	312	538	480	574	526	514	802	132	2,840	550	1,320	532
3	308	538	475	556	520	532	760	106	5,730	324	899	688
4	304	508	502	550	508	568	694	140	9,050	279	920	2,190
5	244	485	520	556	520	598	706	272	10,100	254	520	1,920
6	279	465	502	568	514	604	754	290	8,990	195	304	1,660
7	265	460	480	556	496	598	796	340	8,540	162	248	1,320
8	240	445	475	562	502	586	820	279	8,060	279	254	1,140
9	248	440	490	562	502	580	802	183	8,210	268	308	976
10	272	435	520	562	508	580	766	140	8,150	350	296	920
11	286	435	550	556	502	592	700	92	8,600	598	a 280	796
12	300	435	550	550	520	592	688	84	8,510	748	a 350	682
13	312	435	532	544	520	598	676	459	7,250	508	a 360	604
14	385	425	538	538	514	562	616	3,600	6,000	445	a 370	568
15	574	420	538	532	520	604	568	3,280	5,170	420	a 390	574
16	736	415	520	526	514	652	556	2,260	5,250	400	316	592
17	712	470	502	538	514	646	556	2,490	5,040	345	445	520
18	742	485	526	544	514	652	544	2,980	4,730	254	360	450
19	944	490	526	538	514	706	574	3,090	4,230	180	450	450
20	1,040	485	532	538	496	724	574	3,260	3,840	177	455	976
21	754	490	556	538	508	688	550	3,710	3,600	192	420	2,100
22	664	480	562	532	508	664	544	5,300	3,220	258	336	1,700
23	616	480	568	532	502	640	538	4,520	2,570	293	282	2,040
24	598	475	568	538	502	616	544	4,230	1,890	192	272	2,680
25	580	475	568	520	502	610	574	3,420	1,310	162	244	3,220
26	574	470	574	514	502	604	688	3,300	976	158	220	2,760
27	568	470	574	465	508	616	574	3,340	670	155	216	2,440
28	568	460	568	415	514	652	450	2,980	440	189	258	2,310
29	562	465	544	445	-	724	360	2,440	286	183	258	2,160
30	550	470	544	470	-----	754	251	2,570	240	180	286	2,200
31	550	-----	568	490	-----	760	-----	3,000	-----	237	316	-----
Total	15,407	14,088	16,432	16,477	14,296	19,330	18,815	62,467	146,202	9,203	12,713	41,688
Mean	497	470	530	532	511	624	627	2,015	4,873	297	410	1,390
Ac-ft	30,560	27,940	32,590	32,680	28,360	38,340	37,320	123,900	290,000	18,250	25,220	82,690

Calendar year 1960: Max 3,310 Min 75 Mean 640 Ac-ft 464,600  
Water year 1960-61: Max 10,100 Min 84 Mean 1,061 Ac-ft 767,800

a No gage-height record.



## PLATTE RIVER BASIN

6-7576. Kiowa Creek at K-79 Reservoir, near Eastonville, Colo.

Location.--Lat 39°04'00", long 104°34'55", in SE 1/4 sec. 29, T.11 S., R.64 W., in reservoir area, 140 ft upstream and 250 ft from left end of earth-fill dam on Kiowa Creek and 1.2 miles west of Eastonville.

Drainage area.--3.20 sq mi.

Records available.--August 1955 to September 1961 (no winter records).

Gage.--Water-stage recorder and concrete drop-inlet control structure. Datum of gage is 7,287.14 ft above mean sea level (Soil Conservation Service bench mark).

Extremes.--Maximum outflow during year, 3.4 cfs Aug. 17 (gage height, 5.94 ft); no flow for many days. Maximum inflow, 17 cfs (average for 5-minute interval) Aug. 17, computed from outflow and change in reservoir contents; no rainfall on reservoir surface during time of peak inflow.

1955-61: Maximum outflow, 1,480 cfs July 30, 1957 (gage height, 22.79 ft), from rating curve extended above 68 cfs on basis of slope-area measurement of peak flow in spillway and theoretical flow in outlet tube; no flow for many days in each year. Maximum inflow, 5,250 cfs (average for 5-minute interval) July 30, 1957, computed from outflow and change in reservoir contents; no rainfall on reservoir surface during time of peak inflow.

Remarks.--Records fair prior to May 20 and good thereafter.

Records of daily discharge are outflow from reservoir, determined from stage-discharge relation for outlet structure. Reservoir is formed by earth dam, 755 ft long, with grass sodded emergency spillway section at gage height 20.1 ft; dam completed in June 1955. Outlet is a 3-foot square uncontrolled drop-inlet structure covered with an anti-vortex baffle, with two 12-inch square uncontrolled portholes on upstream face and two on right face. Crest of drop inlet is at gage-height 10.84 ft; inverts of portholes on upstream face are at gage heights 2.90 and 6.87 ft and inverts of portholes on right face are at 4.87 and 8.85 ft. Drop inlet structure connects to a 24-inch diameter outlet pipe at base of dam. Reservoir capacity based on 1959 survey, 125 acre-ft at spillway crest, 23.1 acre-ft at crest of drop inlet, and 12.6, 4.75, 0.83, and 0.00 acre-ft at inverts of portholes. No dead storage. Dam constructed by U. S. Soil Conservation Service as part of the Kiowa Creek Watershed Protection Project.

Cooperation.--Reservoir capacity table furnished by U. S. Soil Conservation Service.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0.2		0.1		0.05	
2		(*)					.2	(*)0.08	.4	0.01	.2	0.05
3						(*)	.2		.7	.01	.2	
4							.2	.1	.4	0		
5							.4	.1	*.1	.02		.1
6							.2		.1		.03	
7							.2		.1	.1		(*)
8							.2		.1		.6	
9	0.05				(*)		.2	.06	.1		.3	
10							.2					
11							.2		.05			
12							.1	.2			.05	.04
13							.1	.15	.08			
14							.1	.1	.1	(*)		(*)
15							.2					
16							.1	.2	(*)			
17							.1	.2			.8	
18	.4						.1	.2			*.2	
19	.3						.1	.2		.02		
20	.1						.1	*.09				.1
21						(*)	.1	0				
22							.1	0	.04		.02	.05
23								0				
24								0				.1
25								.01				
26	.05						.07				.04	.05
27								.04			.08	
28												
29									(*)		.05	
30										(*)		
31												
Total	2.20	-	-	-	-	-	4.26	2.80	3.08	0.73	3.25	1.66
Mean	0.07	-	-	-	-	-	0.14	0.09	0.10	0.02	0.10	0.06
(+)	0.01	-	-	-	-	-	0.01	0.85	0.87	0.87	0.91	0.90
(++)	1.00	-	-	-	-	-	0.28	0.39	3.07	1.29	2.72	1.02

\* Discharge measurement made on this day.

(+) Contents, in acre-feet, at end of month, in reservoir.

(++) Precipitation, in inches, during month, at rain gage at reservoir.

6-7580. Kiowa Creek at Elbert, Colo.

Location.--Lat 39°12'35", long 104°32'00", in SE 1/4 sec. 3, T.10 S., R.64 W., on right bank a quarter of a mile southeast of Elbert and half a mile upstream from West Kiowa Creek.

Drainage area.--28.6 sq mi.

Records available.--May 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,740 ft (from topographic map).

Average discharge.--6 years, 0.24 cfs (174 acre-ft per year).

Extremes.--Maximum discharge during year, 48 cfs Aug. 16 (gage height, 3.61 ft); no flow most of year.

1955-61: Maximum discharge, 305 cfs Aug. 27, 1955 (gage height, 4.40 ft), from rating curve extended above 61 cfs; no flow most of each year.  
Maximum flood known occurred May 30-31, 1935; discharge at site about 1 mile downstream, 43,500 cfs, by slope-area measurement of peak flow. Most of the water is believed to have passed this station. For discussion of this flood, see WSP 997.

Remarks.--Records poor. Floodflows decreased by a series of retarding dams on Kiowa Creek and tributaries above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	0		0	0	**0
2							0	*0		0	0	0
3		(*)	(*)			(*)	0	0	(*)	0	0	0
4							*0	0		0	0	0
5							0	0		0	0	0
6				(*)			0	0		0	0	0
7							0	0		0	0	0
8							0	0		0	0	0
9					(*)		0	0		0	0	0
10							1	0		0	0	0
11							1	0		0	0	0
12							1	0		0	0	0
13							1	0		0	0	0
14							0	0		0	0	0
15							0	*1		*0	0	*0
16							0	1	(**)	0	*2.3	0
17							0	0		0	1	0
18							0	0		0	*0	0
19							0	0		0	0	0
20							*0	0		0	0	0
21							0	0		0	0	0
22							0	0		0	0	0
23						(*)	0	0		0	0	0
24							0	0		0	0	1
25							*1	0		0	0	0
26							1	0		0	0	0
27							1	0		0	0	0
28							0	0		*1	0	0
29							0	0		0	0	0
30							0	0	(*)	0	0	0
31		-----			-----		-----	0	-----	0	0	-----
Total	0	0	0	0	0	0	0.7	0.2	0	0.2	2.4	0.2
Mean	0	0	0	0	0	0	0.02	0.006	0	0.006	0.08	0.007
Ac-ft	0	0	0	0	0	0	1.4	0.4	0	0.4	4.8	0.4

Calendar year 1960: Max 114 Min 0 Mean 1.18 Ac-ft 858

Water year 1960-61: Max 2.3 Min 0 Mean 0.01 Ac-ft 7.4

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Nov. 2 to Mar. 3.

## PLATTE RIVER BASIN

6-7582. Kiowa Creek at Kiowa, Colo.

Location.--Lat 39°20', long 104°29', in SW $\frac{1}{4}$  sec.20, T.8 S., R.63 W., on left bank 0.7 mile upstream from bridge on State Highway 86 and 0.7 mile south of Kiowa.

Drainage area.--111 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,350 ft (estimated from nearby bench mark).

Average discharge.--6 years, 3.78 cfs (2,740 acre-ft).

Extremes.--Maximum discharge during year, 592 cfs July 28 (gage height, 5.07 ft); no flow for many days.

1955-61: Maximum discharge, 5,980 cfs July 20, 1957 (gage height, 6.62 ft, from floodmark), from rating curve extended above 2,200 cfs by logarithmic plotting; no flow for many days in each year.

Maximum flood known occurred May 30-31, 1935; discharge at Elbert about 9 $\frac{1}{2}$  miles upstream, 43,500 cfs, and at site about 12 miles downstream 110,000 cfs, by slope-area measurement of peak flow. For discussion of this flood see WSP 997.

Remarks.--Records poor. Little or no diversion above station. Floodflow regulated to some extent by a series of retarding dams on Kiowa Creek and tributaries above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0					*3.3	2.1	0.2	3.8	0	*6.6	5.9
2	0					6.3	2.3	*1	5.6	0	9.5	5.2
3	0	(*)	(*)			*3.0	2.5	.2	7.5	0	*9.0	7.5
4	0					5.9	*2.7	.2	10	0	4.1	8.0
5	0					4.1	3.0	.4	*6.3	0	1.9	4.5
6	0				(**)	3.2	2.3	.2	7.5	0	.8	3.2
7	0					*2.7	2.1	1.0	9.5	1.0	*.5	*2.5
8	0		0			3.2	1.9	1.0	10	2.5	1.2	2.5
9	0				(*)	2.5	3.8	.6	6.3	.2	2.7	2.7
10	0					2.7	2.5	.7	5.9	0	2.3	2.3
11	0					3.0	1.9	.4	5.2	*60	2.7	2.5
12	0					2.7	2.5	.2	3.8	*38	3.9	2.3
13	0					2.7	2.7	.6	3.3	13	4.8	2.1
14	0					3.0	*2.7	13	2.3	7.5	3.0	1.6
15	0					3.0	2.5	*8.0	3.0	*1.4	*1.4	*1.4
16	0			0.2	1.5	3.2	2.5	6.6	*1.9	1.0	3.0	1.2
17	0					4.5	2.7	6.3	1.1	.6	*7.0	1.1
18	0					5.6	2.7	6.3	.6	.5	1.9	1.0
19	3.6	(*)				3.8	2.5	4.5	.8	.3	.8	1.1
20	3					3.2	2.7	3.2	1.6	.5	.4	1.9
21	0					3.4	2.7	4.1	.1	.8	.4	1.4
22	0		.1			*2.7	1.6	4.1	0	1.0	.4	1.4
23	0					3.4	1.2	3.4	0	.2	.1	2.5
24	0					3.8	*1.9	3.4	0	0	0	4.1
25	0					4.1	2.3	4.5	0	0	0	3.2
26	0					3.8	*1.2	3.8	0	.3	0	2.7
27	0					3.4	.2	3.8	0	*2.1	0	2.3
28	0					4.1	.2	3.4	0	*4.7	0	2.5
29	0					3.2	.2	3.4	0	101	0	2.3
30	0					1.6	.1	3.0	*0	80	*8.7	2.1
31	0					2.1		3.4		22	*12	
Total	3.9	0	1.6	6.2	42.0	112.2	62.2	94.0	96.1	380.9	89.1	85.0
Mean	0.13	0	0.05	0.2	1.5	3.62	2.07	3.03	3.20	12.3	2.87	2.83
Ac-ft	7.7	0	3.2	12	83	223	123	186	191	756	177	169

Calendar year 1960: Max 568 Min 0 Mean 8.09 Ac-ft 5,880

Water year 1960-61: Max 101 Min 0 Mean 2.67 Ac-ft 1,930

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Nov. 3 to Mar. 1 (stage-discharge relation affected by ice during most of period).

## PLATTE RIVER BASIN

61

6-7583. Kiowa Creek at Bennett, Colo.

Location.--Lat 39°44'54", long 104°24'46", in NW<sup>1</sup>/<sub>4</sub> sec.35, T.3 S., R.63 W., on left bank about a quarter of a mile downstream from U. S. Highway 36, 40, and 287 relocated, and 1 mile east of Bennett.

Drainage area.--236 sq mi.

Records available.--March 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,430 ft (from topographic map). Prior to Oct. 1, 1960, at datum 0.15 ft higher.

Extremes.--Maximum discharge during year, 1,770 cfs July 11 (gage height not determined), by critical-depth measurement of peak flow; no flow for most of time.  
1960-61: Maximum discharge, that of July 11, 1961; no flow for many days in each year.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Little or no diversion above station.  
Floodflow regulated to some extent by a series of retarding dams on Kiowa Creek and tributaries above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		(*)			0	*3.0	2.4	0	*0	0	5.3	0
2					0	*5	4.1	0	1.2	0	3.9	0
3			(*)		0	*12	*5.2	0	2.3	0	3.0	1.4
4	(*)			(*)	0	8.8	4.1	0	*2.8	0	5.1	6.8
5					0	8.1	4.4	0	1.8	0	0	3.0
6					*0	1.0	*4.9	0	2.0	0	0	.2
7					0	*9.0	4.8	1.6	2.2	0	0	0
8					0	5.1	2.8	4.1	2.3	0	0	0
9					0	*16	4.1	1.4	1.4	0	0	0
10					0	1.5	1.3	0	4.6	0	1.9	0
11					0	1.2	8.8	0	.3	*8.4	*4.5	0
12					0	1.1	5.2	0	0	*21.6	0	0
13					0	1.0	*4.8	*4.7	0	2.4	0	0
14					0	*3.2	1.7	4.5	.1	*1.7	*4.0	*0.
15					0	4.1	0	*4.7	0	0	0	0
16					0	1.8	1.0	*1.9	6.2	0	0	0
17					0	3.0	2.7	1.0	1.9	0	0	0
18					0	1.5	2.0	6.8	0	0	0	0
19		(*)		(*)	0	2.2	1.0	*3.0	0	0	0	0
20					0	*11	0	4.1	0	0	0	0
21					1.0	6.8	0	8.1	0	0	*0	0
22					2.0	8.8	0	6.2	0	0	0	0
23					.8	8.8	0	2.7	0	0	0	0
24					0	5.5	0	2.9	0	0	0	2.7
25					0	*2.0	4.3	1.2	0	0	0	1.3
26					0	1.6	6.8	1.8	0	0	0	5.5
27					0	1.0	2.4	1.1	0	0	0	.3
28					0	1.8	0	.1	0	0	0	.2
29					-	1.4	0	1.0	0	*6.3	0	0
30					-----	1.2	0	.1	0	2.8	0	0
31		-----			-----	1.6	-----	0	-----	8.0	0	-----
Total	0	0	0	0	3.8	216.6	90.5	171.9	162.3	496.7	159.6	57.4
Mean	0	0	0	0	0.14	6.99	3.02	5.55	5.41	16.0	5.15	1.91
Ac-ft	0	0	0	0	7.5	430	180	341	322	985	317	114

Calendar year 1960: Max 597 Min 0 Mean - Ac-ft -  
Water year 1960-61: Max 216 Min 0 Mean 3.72 Ac-ft 2,700

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Oct. 1 to Mar. 3, Mar. 6, 7, 22-25, Mar. 27 to Apr. 13, July 11, Aug. 12-14.



## PLATTE RIVER BASIN

6-7585. South Platte River near Weldona, Colo.

Location.--Lat 40°19'20", long 103°55'15", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec. 7, T.4 N., R.58 W., on left bank 400 ft (revised) downstream from bridge on State Highway 144, 2.8 miles southeast of Weldona, and 4.2 miles upstream from Bijou Creek.

Drainage area.--13,245 sq mi.

Records available.---October 1952 to September 1961.

Gage.---Water-stage recorder. Datum of gage is 4,307.80 ft above mean sea level, datum of 1929.

Average discharge.---9 years, 422 cfs (305,500 acre-ft per year).

Extremes.---Maximum discharge during year, 7,740 cfs June 6 (gage height, 8.22 ft); minimum daily, 48 cfs May 4, 5.  
1952-61: Maximum discharge, 14,200 cfs May 11, 1957 (gage height, 9.92 ft); minimum daily, 43 cfs Dec. 9, 1952.

Remarks.---Records good. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain and transbasin diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 19 to Sept. 22)

2.5	40	3.5	345	6.0	2,660
2.6	52	4.0	640	7.0	4,500
2.7	70	4.5	1,020	8.1	7,380
3.0	155	5.0	1,510		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	332	134	105	120	418	384	394	80	1,850	118	200	288
2	332	127	105	134	384	389	430	75	1,700	120	478	418
3	327	127	108	148	322	418	478	54	1,750	356	550	562
4	327	127	115	197	236	448	389	48	3,070	378	250	661
5	223	127	115	204	200	490	309	48	5,110	318	183	1,220
6	148	124	112	208	169	544	296	61	7,230	309	110	948
7	110	124	113	183	158	568	300	105	5,510	284	118	745
8	85	124	115	166	148	562	322	256	5,550	246	268	544
9	78	124	115	148	141	568	340	272	4,990	236	314	424
10	134	124	118	115	138	574	345	190	5,110	236	304	389
11	222	120	118	100	141	586	362	155	5,300	318	280	478
12	260	124	118	95	144	592	322	118	5,600	460	340	418
13	296	124	118	90	148	604	250	204	5,710	562	350	367
14	272	120	118	88	152	610	228	550	5,080	406	378	362
15	250	120	115	92	152	580	225	1,790	4,280	362	356	232
16	322	120	115	92	144	562	204	1,390	3,590	314	336	242
17	394	118	112	92	138	586	228	868	3,470	239	384	280
18	276	115	108	92	144	628	246	812	3,300	172	406	250
19	276	108	112	90	134	628	232	900	2,720	134	280	204
20	372	110	115	80	155	696	232	972	2,310	108	356	260
21	314	110	112	90	194	675	232	1,410	2,070	134	389	424
22	197	108	112	78	250	610	194	1,840	1,830	138	340	948
23	169	105	115	78	264	598	204	2,720	1,510	155	288	1,370
24	155	105	115	80	264	574	246	2,920	1,080	176	232	1,730
25	144	108	118	82	268	538	253	2,950	675	250	276	2,070
26	141	108	115	82	336	484	246	2,510	332	228	246	2,290
27	144	110	115	92	378	484	288	2,400	345	236	232	2,100
28	152	110	110	98	384	532	280	2,470	424	239	225	1,940
29	148	105	115	197	-	520	242	2,200	276	228	228	1,830
30	141	105	115	378	-----	550	130	1,810	176	228	272	1,710
31	141	-----	112	367	-----	484	-----	1,810	-----	268	318	-----
Total	6,887	3,515	3,529	4,156	6,104	17,066	8,447	33,988	92,948	7,956	9,287	25,704
Mean	222	117	114	134	218	551	282	1,096	3,098	257	300	857
Ac-ft	13,660	6,970	7,000	8,240	12,110	33,850	16,750	67,410	184,400	15,780	18,420	50,980

Calendar year 1960: Max 1,710 Min 78 Mean 385 Ac-ft 279,300  
Water year 1960-61: Max 7,230 Min 48 Mean 602 Ac-ft 455,600

6-7600. South Platte River at Balzac, Colo.

Location--Lat 40°24'24", long 103°27'58", in NE $\frac{1}{4}$  sec.13, T.5 N., R.55 W., on right bank just upstream from highway bridge at Balzac siding, 2.8 miles northeast of Union.

Drainage area--16,852 sq mi.

Records available--October 1916 to September 1961. Prior to October 1933 monthly discharge only, published in WSP 1310.

Gage--Water-stage recorder. Datum of gage is 4,091.06 ft above mean sea level, datum of 1929. Prior to Oct. 18, 1935, chain gage or water-stage recorder at various sites near present site at different datums. Oct. 18 to Dec. 16, 1935, staff gage and Dec. 17, 1935, to Aug. 20, 1947, water-stage recorder, at site 250 ft upstream at present datum. Since Oct. 1, 1936, supplementary water-stage recorder on secondary channel 600 ft to the left at datum 1.69 ft lower.

Average discharge--45 years, 359 cfs (259,900 acre-ft per year).

Extremes--Maximum discharge during year, 7,770 cfs June 7 (gage height, 8.76 ft); minimum daily, 9.2 cfs Nov. 30, Dec. 1. 1917-61: Maximum gage height, 11.43 ft May 31, 1935 (discharge not determined); minimum daily discharge, 1.3 cfs Jan. 25, 1947. Flood of June 11, 1921, reached a daily discharge of 31,200 cfs.

Remarks--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain and transbasin diversions, storage reservoirs, power developments, ground-water withdrawals, diversions above station for irrigation of about 1,065,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 21-26, May 6-14, Aug. 3-6, Sept. 5-28)

Oct. 1 to June 20

June 21 to Sept. 30

2.2	6.0	4.0	530	2.7	111
2.3	10	6.0	1,780	3.0	172
2.4	16	7.0	2,700	3.5	326
2.5	25	7.5	3,510	4.0	550
2.6	37	8.0	4,810	6.0	1,780
2.8	75	8.8	7,940		
3.3	210				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	201	12	9.2	b13	19	15	23	222	1,920	165	287	195
2	213	12	10	b12	31	16	22	207	1,880	182	271	226
3	216	12	11	b13	20	19	22	210	2,050	195	408	349
4	234	12	11	b14	18	17	22	210	2,440	277	198	409
5	240	12	11	b15	16	18	20	192	3,690	290	162	331
6	207	12	b10	b15	19	18	20	186	5,840	248	232	239
7	180	12	b9.6	b15	18	33	19	177	7,520	226	229	150
8	150	12	9.6	b14	b17	20	20	138	7,020	220	182	131
9	125	12	9.6	13	13	20	20	216	5,960	215	212	131
10	88	11	9.6	12	12	23	23	225	5,430	220	188	144
11	35	12	11	12	13	26	23	198	5,650	258	204	146
12	40	12	12	12	13	30	24	165	5,800	322	220	153
13	46	12	b11	12	14	29	26	177	6,080	388	268	131
14	51	11	12	b12	13	30	25	315	6,040	441	294	121
15	60	11	12	13	12	29	24	420	5,180	372	297	159
16	60	11	b11	14	12	25	24	560	3,900	326	271	185
17	98	12	b11	13	13	29	23	142	3,050	277	248	172
18	115	13	14	13	b15	32	282	80	2,980	239	287	170
19	78	12	12	b13	b15	31	485	142	2,370	204	277	140
20	49	12	12	b12	12	27	440	540	1,770	180	255	180
21	25	12	11	b12	12	40	261	1,150	1,410	150	271	206
22	19	12	b11	b13	14	26	36	1,670	1,060	140	268	284
23	15	11	12	b14	14	22	29	2,370	795	129	242	336
24	14	10	12	15	13	24	22	2,860	545	122	218	450
25	13	11	12	b14	12	25	19	2,990	308	131	212	790
26	12	10	12	b14	12	25	15	2,880	180	167	223	1,100
27	11	10	12	b13	15	23	40	2,240	322	195	218	1,240
28	11	b9.6	b12	b13	15	32	120	2,240	392	193	212	1,140
29	11	b9.6	b11	b14	-	26	153	2,390	384	195	182	1,030
30	11	9.2	b12	b16	-----	26	148	2,150	255	209	165	932
31	12	-----	b12	b18	-----	27	-----	1,800	-----	268	180	-----
Total	2,640	3,414	3,476	4,18	4,22	7,83	2,430	29,462	9,222	7,144	7,381	11,370
Mean	85.2	11.4	11.2	13.5	15.1	25.3	81.0	950	3,074	230	238	379
Ac-ft	5,240	677	689	829	837	1,550	4,820	58,440	182,900	14,170	14,640	22,550

Calendar year 1960: Max 1,670 Min 9.2 Mean 203 Ac-ft 147,100  
Water year 1960-61: Max 7,520 Min 9.2 Mean 425 Ac-ft 307,300

b Stage-discharge relation affected by ice.

## PLATTE RIVER BASIN

6-7640. South Platte River at Julesburg, Colo.

Location (revised).--Lat 40°58'46", long 102°15'15", in NE¼ sec.33, T.12 N., R.44 W., on left bank 215 ft downstream from bridge on U. S. Highway 385, 0.9 mile southeast of Julesburg, 3 miles upstream from Colorado-Nebraska State line, and 8 miles downstream from Lodgepole Creek.

Drainage area.--23,138 sq mi.

Records available.--April 1902 to September 1961. Monthly discharge only for some periods, published in WSP 1310. Published as "near Julesburg" 1903-8, 1915-16 and as "at Ovid" 1922-24.

Gage.--Water-stage recorder. Datum of gage is 3,446.76 ft above mean sea level, datum of 1929. Apr. 1, 1902, to May 10, 1922, staff or chain gages, and Oct. 1, 1924, to Sept. 30, 1956, water-stage recorder on channel 1,600 ft to right at several sites within 1,800 ft of present site at various datums. May 11, 1922, to Sept. 30, 1924, water-stage recorder and supplemental chain gages at site about 8½ miles upstream at Ovid at different datum. Oct. 1, 1956, to Dec. 10, 1958, water-stage recorder at site 135 ft downstream at present datum (used as an auxiliary gage Oct. 1, 1941, to Sept. 30, 1956). Since Oct. 1, 1956, supplemental water-stage recorder on channel 1,600 ft to right at site 85 ft downstream.

Average discharge.--59 years, 458 cfs (331,600 acre-ft per year).

Extremes.--Maximum discharge during year, 7,120 cfs June 10; minimum daily, 22 cfs Oct. 1.  
1902-61: Maximum discharge, 31,300 cfs June 2, 1935, from rating curve extended above 16,000 cfs; no flow Aug. 18-20, 1902, July 25 to Aug. 7, 1903.

Remarks.--Records good except those for periods of ice effect or no gage-height record on channel 2, which are fair. Discharge measurements generally made at least five times each month. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals, diversions for irrigation of about 1,220,000 acres above station, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	106	72	206	287	141	231	107	2,310	243	241	34
2	23	104	96	208	218	133	257	101	1,980	292	212	36
3	24	99	124	165	188	155	259	99	2,070	218	181	35
4	24	98	150	172	211	139	260	102	2,460	168	174	34
5	29	101	149	174	245	137	271	93	2,680	134	169	33
6	32	98	172	182	225	160	284	92	2,570	117	182	35
7	33	99	186	224	234	215	199	87	3,020	109	192	44
8	34	98	192	246	250	220	199	75	3,990	124	146	89
9	41	95	212	265	280	237	157	70	3,470	235	101	120
10	43	102	213	283	273	253	193	69	6,750	218	75	126
11	42	102	220	286	268	258	297	62	5,930	179	61	137
12	41	100	233	278	270	272	322	58	5,120	169	55	145
13	50	97	236	270	262	278	360	60	5,050	149	64	139
14	63	96	243	270	246	283	358	106	5,080	129	46	120
15	81	96	256	274	246	286	324	181	5,440	115	45	134
16	83	94	249	269	250	278	318	150	5,330	97	45	135
17	84	95	252	264	250	283	316	150	4,880	85	50	129
18	86	94	257	246	243	289	306	162	4,190	73	46	116
19	86	99	253	235	234	279	264	204	3,540	67	44	131
20	96	96	239	221	232	285	251	204	3,110	64	43	159
21	127	100	239	230	231	276	304	268	2,410	66	43	156
22	122	101	167	245	231	277	397	740	1,810	64	40	165
23	110	97	167	248	231	277	397	1,010	1,440	57	37	195
24	104	99	228	234	231	272	334	1,250	1,120	52	38	236
25	99	97	288	240	230	269	290	1,610	800	52	37	285
26	103	95	269	223	196	242	278	2,040	630	62	36	352
27	100	95	252	188	165	186	225	2,420	458	104	34	407
28	102	66	238	201	157	166	146	2,620	299	121	34	585
29	102	52	178	194	-	153	120	2,400	203	131	33	797
30	99	60	167	270	-----	144	106	2,500	165	151	33	866
31	105	-----	188	333	-----	158	-----	2,540	-----	253	36	-----
Total	2,190	2,831	6,385	7,344	6,584	7,001	8,023	21,630	90,305	4,098	2,573	5,975
Mean	70.6	94.4	206	237	235	226	267	698	3,010	132	83.0	199
Ac-ft	4,340	5,620	12,660	14,570	13,060	13,890	15,910	42,900	179,100	8,130	5,100	11,850

Calendar year 1960: Max 1,500 Min 12 Mean 258 Ac-ft 187,300  
Water year 1960-61: Max 6,750 Min 22 Mean 452 Ac-ft 327,100

Note.--Stage-discharge relation affected by ice on channel 2 Jan. 27 to Feb. 10. No gage-height record on channel 2 Feb. 18-26, Mar. 13-24, Apr. 6-10, 14-26, June 2-14, 16-19, July 3-7, 10-14, 16-18, 26-30, Aug. 1, 2, 6, 8, 10-13.

6-8250. South Fork Republican River near Idalia, Colo.

Location.--Lat 39°37'00", long 102°14'30", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.13, T.5 S., R.44 W., on left bank 0.7 mile east of State Highway 51, 1 $\frac{1}{2}$  miles upstream from Landsman Creek, 4 miles upstream from Bonny Dam, and 6 $\frac{1}{2}$  miles southeast of Idalia.

Drainage area.--1,300 sq mi, approximately.

Records available.--May 1950 to September 1961.

Gage.--Water-stage recorder. Prior to Aug. 10, 1951, at site 4 miles upstream at different datum. Aug. 10, 1951, to Sept. 30, 1955, at site 2 $\frac{1}{2}$  miles upstream at different datum.

Average discharge.--11 years, 34.6 cfs (25,050 acre-ft per year).

Extremes.--Maximum discharge during year, 2,960 cfs May 13 (gage height, 8.40 ft), from rating curve extended above 46 cfs on basis of slope-area measurement of peak flow; no flow Aug. 7-10.

1950-61: Maximum discharge, 14,300 cfs May 16, 1957 (gage height, 9.64 ft); no flow at times in 1952-54, 1959-61.

Maximum flood known since at least 1865, 103,000 cfs May 31, 1935, by slope-area measurement three-quarters of a mile upstream.

Remarks.--Records poor. Discharge measurements generally made two or more times a month. Diversions above station for irrigation.

Cooperation.--Thirty-five discharge measurements furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	33	26	28	31	30	35	34	22	3.2	0.3	3.2
2	8.1	30	28	29	31	31	34	30	30	4.8	.2	1.6
3	9.5	31	28	25	29	31	32	31	37	4.8	.1	9.5
4	11	32	27	24	28	33	32	44	41	3.6	.1	20
5	8.1	31	25	29	29	34	31	37	37	4.4	.1	16
6	8.1	30	24	30	28	35	32	36	36	6.0	.1	14
7	8.8	32	24	30	29	36	36	34	31	4.4	0	12
8	8.8	33	25	27	30	33	41	27	29	4.8	0	12
9	5.6	34	26	26	27	31	35	26	26	4.8	0	11
10	5.2	34	29	26	26	29	38	26	23	4.8	0	12
11	12	32	33	29	25	30	36	25	21	4.8	.1	14
12	12	32	29	29	26	31	35	23	19	6.0	23	15
13	15	31	30	28	24	31	36	326	17	4.8	113	15
14	15	30	30	27	24	32	36	82	16	26	32	15
15	22	27	32	28	25	32	36	44	19	27	27	15
16	22	26	27	31	25	32	38	48	21	15	25	15
17	23	27	26	31	26	37	36	50	19	8.1	16	15
18	32	28	27	33	23	41	32	48	17	4.4	15	10
19	35	28	28	27	22	36	30	47	18	3.2	13	12
20	25	29	30	25	30	32	29	48	19	6.0	15	26
21	24	28	28	25	29	30	29	51	12	12	10	24
22	24	27	27	24	30	30	25	47	9.5	8.8	9.5	22
23	25	29	25	24	30	31	24	44	8.1	7.4	8.1	24
24	25	28	27	24	30	31	23	45	12	6.0	6.7	29
25	25	29	29	24	31	34	27	41	10	1.8	6.0	27
26	27	29	31	24	30	34	27	37	8.8	.4	5.6	25
27	27	29	30	23	31	32	26	32	4.8	.4	5.2	23
28	29	27	27	23	31	35	26	30	3.6	15	6.0	23
29	29	25	24	23	-	36	27	28	4.4	8.8	2.0	24
30	30	23	28	23	-----	36	27	29	2.8	8.1	1.7	26
31	31	-----	29	27	-----	35	-----	29	-----	2.4	3.2	-----
Total	588.2	884	859	826	780	1,021	951	1,479	574.0	222.0	344.0	510.3
Mean	19.0	29.5	27.7	26.6	27.9	32.9	31.7	47.7	19.1	7.16	11.1	17.0
Ac-ft	1,170	1,750	1,700	1,640	1,550	2,030	1,890	2,930	1,140	440	682	1,010

Calendar year 1960: Max 563 Min 0 Mean 30.2 Ac-ft 21,910  
 Water year 1960-61: Max 326 Min 0 Mean 24.8 Ac-ft 17,930

Peak discharge (base, 1,000 cfs).--May 13 (7:40 p.m.) 2,960 cfs (8.40 ft).

Note.--Stage-discharge relation affected by ice Nov. 28 to Dec. 2, Dec. 7-9, 16-19, 21-25, 28, 29, Jan. 3, 4, Jan. 19 to Feb. 9, Feb. 18, 19.



## KANSAS RIVER BASIN

6-8255. Landsman Creek near Hale, Colo.

Location--Lat 39°34'40", long 102°14'50", in SW $\frac{1}{4}$  sec. 36, T.5 S., R.44 W., on right bank 300 ft downstream from bridge on State Highway 51, 3 miles upstream from mouth, 5 miles southwest of Bonny Dam, and 7 miles southwest of Hale.

Drainage area--450 sq mi, approximately.

Records available--May 1950 to September 1961.

Gage--Water-stage recorder and Parshall flume. Altitude of gage is 3,720 ft (from topographic map). Prior to Oct. 21, 1950, and June 6 to Aug. 10, 1951, at datum 0.68 ft lower. Oct. 21, 1950, to June 5, 1951, at datum 0.79 ft higher.

Average discharge--11 years, 4.66 cfs (3,370 acre-ft per year).

Extremes--Maximum discharge during year, 576 cfs May 13 (gage height, 4.69 ft); minimum daily, 0.3 cfs for many days.  
1950-61: Maximum discharge, 4,570 cfs July 24, 1957 (gage height, 8.84 ft), from rating curve extended above 940 cfs on basis of slope-area measurement at gage height 7.69 ft; no flow Aug. 20-28, 1955.  
Maximum stage known, about 10 ft, May 30, 31, 1935, present datum, from information by local resident.

Remarks--Records poor. Discharge measurements generally made two or more times a month. Small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.8	1.0	1.3	a 1.2	1.3	1.5	2.8	1.5	0.6	0.5	0.3
2	.4	.8	1.2	1.1	a 1.5	1.4	1.5	2.1	1.8	.6	.5	.3
3	.3	.8	1.4	1.0	a 1.4	1.5	1.5	2.1	2.2	.5	.5	.4
4	.4	.8	1.7	1.0	a 1.4	1.6	1.4	5.3	7.3	.5	.4	.4
5	.4	.8	1.1	1.2	a 1.4	1.7	1.2	3.8	3.6	.5	.4	.4
6	.4	.8	.9	1.1	a 1.4	1.6	1.3	3.7	2.9	.5	.5	.3
7	.4	.8	1.2	1.2	1.4	1.6	1.3	2.8	2.2	.5	.4	.3
8	.4	.8	1.6	1.3	1.4	1.6	1.9	2.3	1.8	.6	.4	.3
9	.3	.8	1.6	1.4	1.4	1.7	2.6	2.2	1.5	.5	.4	.3
10	.3	.8	1.5	1.6	1.5	1.8	2.8	1.9	1.3	.5	.5	.3
11	.4	.9	1.6	1.5	1.5	1.9	2.6	1.8	1.1	.6	.5	.4
12	.3	.9	1.5	1.5	1.5	1.8	2.2	1.6	1.0	.5	.5	.4
13	.4	1.0	1.4	1.6	1.4	1.8	2.2	7.6	1.0	.5	.5	.4
14	.4	1.0	1.6	1.6	1.4	1.8	1.9	1.8	1.0	.6	.5	.4
15	.4	.9	1.3	1.7	1.4	1.8	1.7	5.6	1.0	.5	.5	.4
16	.4	.9	1.2	1.7	1.5	1.8	1.8	4.5	1.1	.5	.5	.3
17	.4	1.0	1.2	1.6	1.2	1.7	1.8	3.7	1.0	.5	.5	.3
18	.8	1.0	1.6	1.5	1.2	2.0	1.6	3.0	.9	.5	.5	.3
19	.8	1.0	1.6	1.3	1.4	1.8	1.5	2.9	.8	.5	.5	.3
20	.5	1.0	1.1	1.3	1.3	1.7	1.4	3.6	.8	.6	.4	.4
21	.6	1.2	1.2	1.4	1.2	1.6	1.5	5.9	.7	.6	.4	.4
22	.6	1.2	1.2	1.5	1.4	1.4	1.6	4.0	.6	1.9	.4	.3
23	.8	1.1	1.7	1.4	1.2	1.4	1.4	3.4	.6	.8	.4	.4
24	1.3	1.2	1.6	1.1	1.2	1.4	1.4	2.8	.6	.5	.4	.5
25	1.3	1.3	1.4	a 1.0	1.2	1.4	1.8	2.4	.6	.4	.4	.5
26	1.3	1.2	1.2	a 1.0	1.3	1.4	1.6	2.2	.6	.4	.4	.4
27	1.2	1.1	.9	a .9	1.2	1.4	1.6	2.2	.5	.4	.4	.4
28	1.2	.7	1.3	a .9	1.2	1.5	1.5	1.9	.5	.5	.4	.5
29	1.4	.8	1.2	a .9	-	1.8	1.5	1.8	.5	.4	.3	.4
30	1.2	1.0	1.2	a 1.0	-----	1.7	1.5	1.7	.6	.4	.3	.4
31	.9	-----	1.3	a 1.0	-----	1.6	-----	1.6	-----	.4	.4	-----
Total	20.3	28.4	41.5	39.6	37.7	50.5	51.1	179.6	41.6	17.3	13.6	11.1
Mean	0.65	0.95	1.34	1.28	1.35	1.63	1.70	5.79	1.39	0.56	0.44	0.37
Ac-ft	40	56	82	79	75	100	101	356	83	34	27	22

Calendar year 1960: Max 76 Min 0.2 Mean 2.25 Ac-ft 1,630

Water year 1960-61: Max 76 Min 0.3 Mean 1.46 Ac-ft 1,060

Peak discharge (base, 350 cfs)--May 13 (6 p.m.) 576 cfs (4.69 ft).

a No gage-height record.

6-8260. Bonny Reservoir near Hale, Colo.

Location.--Lat 39°38'00", long 102°10'40", in SE<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec.9, T.5 S., R.43 W., in stair well to outlet conduit of Bonny Dam on South Fork Republican River, 2 miles west of Hale and 3 miles downstream from Landsman Creek.

Records available.--October 1950 to September 1961.

Gage.--Mercury manometer gage. Datum of gage is at mean sea level (levels by Bureau of Reclamation).

Extremes.--Maximum contents observed during year, 40,280 acre-ft Mar. 10, 11 (elevation, 3,671.48 ft); minimum observed, 32,590 acre-ft Oct. 15-17 (elevation, 3,667.40 ft).

1950-61: Maximum contents observed, 55,030 acre-ft May 17, 1957 (elevation, 3,678.10 ft); minimum observed since appreciable contents was attained, 22,520 acre-ft Oct. 6-14, 1952 (elevation, 3,661.20 ft).

Remarks.--Reservoir is formed by earth-fill dam. Storage began July 6, 1950; dam completed May 4, 1951. Capacity of reservoir, 170,200 acre-ft below elevation 3,710 ft (crest of spillway), of which 128,800 acre-ft is for flood control and 39,900 acre-ft for irrigation. Dead storage, 1,420 acre-ft below elevation 3,635.50 ft (sill of trashrack at outlet conduit). Figures given herein represent total contents.

Cooperation.--Records furnished by Bureau of Reclamation.

Capacity table, water year 1960-61 (elevation, in feet, and total contents, in acre-ft)  
(Furnished by Bureau of Reclamation)

3,665.0	28,460
3,670.0	37,390
3,675.0	47,760

Contents, in acre-feet, between 5 and 7 a.m., water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,322.0	3,322.0	3,458.0	3,654.0	3,825.0	3,971.0	3,739.0	3,741.0	3,754.0	3,684.0	3,582.0	3,458.0
2	3,322.0	3,331.0	3,467.0	3,654.0	3,833.0	3,975.0	3,739.0	3,741.0	3,745.0	3,680.0	3,576.0	3,454.0
3	3,313.0	3,331.0	3,467.0	3,654.0	3,844.0	3,979.0	3,739.0	3,739.0	3,747.0	3,672.0	3,573.0	3,443.0
4	3,313.0	3,331.0	3,486.0	3,663.0	3,844.0	3,984.0	3,739.0	3,749.0	3,751.0	3,667.0	3,565.0	3,438.0
5	3,313.0	3,340.0	3,486.0	3,672.0	3,844.0	3,992.0	3,739.0	3,760.0	3,758.0	3,661.0	3,561.0	3,438.0
6	3,304.0	3,340.0	3,486.0	3,672.0	3,844.0	4,000.0	3,739.0	3,768.0	3,758.0	3,655.0	3,556.0	3,436.0
7	3,304.0	3,349.0	3,486.0	3,682.0	3,857.0	4,008.0	3,739.0	3,779.0	3,758.0	3,652.0	3,546.0	3,434.0
8	3,295.0	3,349.0	3,504.0	3,692.0	3,862.0	4,012.0	3,739.0	3,775.0	3,756.0	3,646.0	3,543.0	3,431.0
9	3,295.0	3,358.0	3,513.0	3,692.0	3,868.0	4,018.0	3,749.0	3,774.0	3,752.0	3,650.0	3,537.0	3,429.0
10	3,286.0	3,367.0	3,524.0	3,701.0	3,882.0	4,028.0	3,758.0	3,770.0	3,749.0	3,654.0	3,532.0	3,423.0
11	3,286.0	3,385.0	3,532.0	3,701.0	3,894.0	4,028.0	3,758.0	3,766.0	3,741.0	3,648.0	3,526.0	3,412.0
12	3,277.0	3,385.0	3,532.0	3,724.0	3,896.0	4,014.0	3,758.0	3,762.0	3,739.0	3,661.0	3,522.0	3,409.0
13	3,277.0	3,394.0	3,541.0	3,730.0	3,898.0	3,994.0	3,768.0	3,749.0	3,737.0	3,655.0	3,541.0	3,400.0
14	3,268.0	3,394.0	3,541.0	3,735.0	3,898.0	3,982.0	3,768.0	3,864.0	3,728.0	3,655.0	3,559.0	3,396.0
15	3,259.0	3,394.0	3,550.0	3,739.0	3,900.0	3,969.0	3,768.0	3,878.0	3,720.0	3,655.0	3,558.0	3,394.0
16	3,259.0	3,394.0	3,550.0	3,743.0	3,908.0	3,943.0	3,768.0	3,876.0	3,716.0	3,654.0	3,550.0	3,392.0
17	3,259.0	3,394.0	3,559.0	3,749.0	3,909.0	3,923.0	3,768.0	3,874.0	3,722.0	3,650.0	3,544.0	3,392.0
18	3,268.0	3,403.0	3,569.0	3,754.0	3,913.0	3,913.0	3,768.0	3,870.0	3,724.0	3,648.0	3,535.0	3,392.0
19	3,295.0	3,403.0	3,578.0	3,758.0	3,921.0	3,898.0	3,764.0	3,860.0	3,724.0	3,636.0	3,530.0	3,389.0
20	3,304.0	3,412.0	3,578.0	3,762.0	3,927.0	3,884.0	3,764.0	3,857.0	3,722.0	3,629.0	3,524.0	3,383.0
21	3,304.0	3,412.0	3,578.0	3,764.0	3,933.0	3,874.0	3,762.0	3,857.0	3,722.0	3,631.0	3,521.0	3,385.0
22	3,304.0	3,422.0	3,578.0	3,768.0	3,941.0	3,855.0	3,760.0	3,855.0	3,722.0	3,627.0	3,508.0	3,382.0
23	3,313.0	3,422.0	3,588.0	3,775.0	3,945.0	3,839.0	3,758.0	3,849.0	3,714.0	3,625.0	3,502.0	3,376.0
24	3,313.0	3,431.0	3,597.0	3,777.0	3,949.0	3,822.0	3,756.0	3,837.0	3,709.0	3,620.0	3,497.0	3,376.0
25	3,313.0	3,431.0	3,606.0	3,779.0	3,953.0	3,806.0	3,754.0	3,833.0	3,705.0	3,612.0	3,491.0	3,380.0
26	3,322.0	3,440.0	3,616.0	3,781.0	3,957.0	3,787.0	3,752.0	3,816.0	3,705.0	3,608.0	3,487.0	3,382.0
27	3,322.0	3,440.0	3,616.0	3,783.0	3,963.0	3,774.0	3,749.0	3,808.0	3,705.0	3,603.0	3,484.0	3,383.0
28	3,322.0	3,449.0	3,625.0	3,785.0	3,967.0	3,758.0	3,747.0	3,800.0	3,699.0	3,608.0	3,478.0	3,380.0
29	3,322.0	3,449.0	3,625.0	3,806.0	-	3,745.0	3,747.0	3,791.0	3,695.0	3,606.0	3,473.0	3,382.0
30	3,322.0	3,458.0	3,635.0	3,806.0	-----	3,739.0	3,743.0	3,781.0	3,692.0	3,601.0	3,464.0	3,382.0
31	3,322.0	-----	3,644.0	3,818.0	-----	3,739.0	-----	3,766.0	-----	3,589.0	3,456.0	-----
(†)	3,667.75	3,668.50	3,669.50	3,670.41	3,671.17	3,670.00	3,670.02	3,670.14	3,669.75	3,669.21	3,668.49	3,668.08
(*)	0	+1,360	+1,860	+1,740	+1,490	-2,280	+40	+230	-740	-1,030	-1,330	-740

Calendar year 1960..... \* -570

Water year 1960-61..... \* +600

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

## KANSAS RIVER BASIN

6-8265. South Fork Republican River near Hale, Colo.

Location.--Lat 39°37'25", long 102°09'45", in SW 1/4 sec. 15, T.5 S., R.43 W., on right bank half a mile downstream from Bonny Dam and 1 mile west of Hale.

Records available.--October 1946 to September 1948, May 1951 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,610 ft (from topographic map). Oct. 1, 1946, to Sept. 30, 1948, at site 4 miles downstream at different datum.

Average discharge.--10 years (1951-61), 26.4 cfs (19,110 acre-ft per year).

Extremes.--Maximum discharge during year, 117 cfs Mar. 12 (gage height, 4.60 ft); minimum daily, 5.8 cfs Oct. 1-4, Jan. 17-19, Aug. 9, 11, 14, 27-30.

1946-48, 1951-61: Maximum discharge, 3,790 cfs May 28, 1947; maximum gage height, 4.87 ft Apr. 28, 1947, site and datum then in use; no flow Aug. 11-13, 1947.

Greatest flood known occurred May 13, 1935, stage and discharge not determined. A discharge of 103,000 cfs was determined at a site near Newton, 5½ miles upstream, with a drainage area of approximately 1,270 sq mi.

Remarks.--Records good. Discharge measurements generally made twice a month. Flow regulated by Bonny Reservoir since July 6, 1950 (see preceding page). Many diversions above station for irrigation. Water diverted by Hale ditch from Bonny Reservoir bypasses station (2,650 acre-ft diverted in 1961).

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

3.9	3.2	4.3	35
4.0	6.5	4.5	80
4.1	12	4.6	112
4.2	21		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.8	6.5	6.5	6.5	6.5	6.5	3.5	3.9	8.6	7.0	6.5	6.5
2	5.8	6.5	6.5	6.5	6.5	6.2	3.5	3.9	5.0	6.5	6.5	6.2
3	5.8	6.5	6.5	6.5	6.5	6.2	3.5	3.7	3.5	6.2	6.2	7.0
4	5.8	6.5	7.0	6.5	6.5	6.2	3.5	3.9	3.4	6.2	6.2	6.5
5	6.2	6.5	6.2	6.5	6.5	6.2	3.5	4.8	4.6	6.5	6.2	6.2
6	6.2	6.5	6.2	6.5	6.5	6.2	3.5	4.8	5.0	6.5	6.2	6.2
7	6.5	6.5	6.2	6.5	6.5	6.5	3.4	5.6	4.8	6.5	6.2	6.2
8	6.5	6.5	6.2	6.5	6.5	6.2	3.1	5.8	4.8	7.6	6.2	6.2
9	6.5	6.5	6.2	6.5	6.5	6.2	3.1	5.8	4.8	7.0	5.8	6.2
10	6.5	6.5	6.2	6.5	6.5	1.6	3.7	5.8	4.6	6.5	6.2	6.2
11	6.2	6.5	6.5	6.5	6.5	7.3	3.9	5.8	2.9	3.2	5.8	7.0
12	6.2	6.5	6.2	6.5	6.5	1.02	3.9	5.8	2.2	7.6	6.2	6.2
13	6.2	6.5	6.2	6.5	6.5	1.09	3.9	6.1	2.2	7.0	6.2	6.2
14	6.2	6.5	6.2	6.2	6.5	1.09	3.9	6.3	1.2	7.0	5.8	6.2
15	6.2	7.6	6.2	6.2	6.5	1.09	3.9	5.5	6.2	7.0	6.2	6.2
16	6.2	6.5	6.2	6.2	6.2	1.09	3.9	6.1	6.2	6.5	6.2	6.2
17	6.2	6.5	6.2	5.8	6.2	1.09	3.9	7.3	6.2	6.5	6.2	6.2
18	7.6	6.5	6.2	5.8	6.2	1.09	3.9	8.6	6.2	6.5	6.2	6.2
19	7.0	6.5	6.2	5.8	6.2	1.09	3.9	8.6	6.2	6.5	6.2	6.5
20	6.5	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.2	6.5	6.2	7.0
21	6.5	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.2	6.5	6.2	6.2
22	6.5	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.2	6.5	6.2	6.2
23	6.5	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.2	6.2	6.2	6.5
24	6.5	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.2	6.2	6.2	7.0
25	7.0	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.2	6.2	6.2	6.2
26	7.0	6.5	6.2	6.2	6.2	1.09	3.9	8.6	6.5	6.2	6.2	6.2
27	7.0	7.0	6.2	6.2	6.2	1.09	3.9	8.6	6.5	6.5	5.8	6.2
28	7.0	7.0	6.2	6.2	6.2	1.09	3.9	8.6	6.5	6.5	5.8	6.2
29	7.6	7.0	6.2	6.2	-	8.3	3.9	8.6	6.2	6.2	5.8	6.5
30	7.6	7.0	6.2	6.5	-----	4.8	3.9	9.0	6.2	6.5	5.8	6.2
31	7.6	-----	6.2	6.5	-----	3.5	-----	9.0	-----	6.5	6.2	-----
Total	202.9	198.1	194.2	195.5	178.1	2157.4	1123	2126	676.1	205.8	190.0	190.7
Mean	6.55	6.60	6.26	6.31	6.36	69.6	37.4	68.6	22.5	6.64	6.13	6.36
Ac-ft	402	393	385	388	353	4,280	2,230	4,220	1,340	408	377	378

Calendar year 1960: Max 144 Min 5.2 Mean 25.1 Ac-ft 18,210

Water year 1960-61: Max 109 Min 5.8 Mean 20.9 Ac-ft 15,150

7-820. Lake Fork above Sugar Loaf Reservoir, Colo.

Location--Lat 39°16'10", long 106°23'40", in sec.13, T.9 S., R.81 W., on left bank 1,000 ft upstream from high-water line of Sugar Loaf Reservoir and 6 miles west of Leadville.

Drainage area--18 sq mi.

Records available--May 1946 to September 1961. Monthly discharge only for some periods, published in WSP 1241 and 1311.

Gage--Water-stage recorder. Altitude of gage is 9,800 ft (from topographic map).

Average discharge--15 years, 41.0 cfs (29,680 acre-ft per year).

Extremes--Maximum discharge during year, 310 cfs June 1 (gage height, 3.40 ft); minimum not determined.

1946-61: Maximum discharge, 610 cfs June 28, 1957 (gage height, 5.22 ft), from rating curve extended above 320 cfs; minimum daily recorded, 1.0 cfs Sept. 10-15, 1959.

Remarks--Records good except those for period of no gage-height record, which are poor. No diversions above station. Transmountain diversions from Colorado River basin to Busk Creek above station through Busk-Ivanhoe tunnel (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	5.0	2.0	110
.7	7.5	3.0	250
1.0	21	3.2	280
1.3	39		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	8.7							270	78	42	16
2	7.5	7.5							253	76	38	14
3	7.2	7.9							205	70	34	20
4	7.2	8.3							184	66	31	20
5	7.2	7.9							194	66	28	27
6	7.2	7.5							199	64	24	*33
7	7.2	8.3							216	59	22	43
8	7.5	8.3							*241	51	*22	52
9	7.9	8.3							253	42	22	63
10	9.9	9.1							260	39	19	63
11	9.1	9.1						50	262	37	18	46
12	8.3	9.1							258	35	17	38
13	6.2	9							246	33	16	32
14	8.3	9							235	33	14	28
15	9.1	8.5							222	33	10	26
16	9.9	8	4.5	4	3.5	3.5	10		223	31	12	26
17	9.9	8							220	*30	18	26
18	10	7.5							212	28	17	*25
19	11	8							211	27	15	31
20	11	8.5							202	30	13	33
21	11	8						170	187	41	20	35
22	10	8						*190	147	40	16	39
23	9.9	8						216	99	38	*14	44
24	9.9	8						238	94	36	12	45
25	9.5	8						223	94	36	20	57
26	*9.5	7.5						236	87	37	27	116
27	9.1	7						248	84	38	20	110
28	8.7	6.5						246	*95	39	18	100
29	9.5	6						229	82	38	16	96
30	7.5	6.5						266	79	33	15	42
31	9.9	-----						268	-----	45	17	-----
Total	273.6	240.0	139.5	124	98.0	108.5	300	3530	5614	1349	627	1346
Mean	8.83	8.00	4.5	4	3.5	3.5	10	114	187	43.5	20.2	44.9
Ac-ft	543	476	277	246	194	215	595	7,000	11,140	2,680	1,240	2,670

Calendar year 1960: Max 332 Min - Mean 35.2 Ac-ft 25,560

Water year 1960-61: Max 270 Min - Mean 37.7 Ac-ft 27,280

Peak discharge (base, 320 cfs)--No peak above base.

\* Discharge measurement made on this day.

Note--No gage-height record Nov. 13 to May 21 (stage-discharge relation affected by ice during most of period).



## ARKANSAS RIVER BASIN

7-830. Halfmoon Creek near Malta, Colo.

Location.--Lat 39°11'10", long 106°22'55", in NW¼ sec.18, T.10 S., R.80 W., on right bank 118 ft upstream from culvert, 2 miles upstream from mouth and 3½ miles southwest of Malta. Prior to Dec. 1, 1960, at site 185 ft downstream.

Drainage area.--23 sq mi.

Records available.--July 1946 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,740 ft (from topographic map). Prior to Dec. 1, 1960, at site 185 ft downstream; at datum 3.18 ft lower prior to May 13, 1948, and 3.00 ft lower thereafter.

Average discharge.--15 years, 29.4 cfs (21,280 acre-ft per year).

Extremes.--Maximum discharge during year, 222 cfs June 9 (gage height, 3.86 ft), from rating curve extended above 93 cfs; minimum not determined.  
1946-61: Maximum discharge, 450 cfs June 30, 1957 (gage height, 3.48 ft, site and datum then in use); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 30

Dec. 1 to Sept. 30

1.8	4.5	2.4	10
1.9	6.5	2.6	20
2.0	9.5	2.9	45
2.1	14	3.3	89
		3.6	140

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11		(*)					13	120	62	67	32
2	10							*15	100	58	67	30
3	9.2							20	75	54	62	33
4	*8.9						(*)	20	69	52	52	32
5	8.6							20	78	51	45	36
6	7.1							18	*84	50	43	*41
7	5.9					(*)		18	90	49	46	47
8	5.9				(*)			18	115	47	*40	55
9	7.4							18	138	42	38	70
10	7.7			(*)				18	138	40	34	73
11	7.4							26	117	*38	32	64
12	6.1							32	113	36	32	57
13	6.8							32	113	34	31	53
14	6.8							26	113	33	27	48
15	8.0							22	112	32	26	45
16	7.1	7	4	3	3	4	7	21	115	30	26	43
17	8.0							24	113	28	32	43
18	*8.9							30	108	27	29	42
19	8.3							39	105	26	26	*46
20	8.0							43	*105	27	26	45
21	7.4							40	106	32	35	43
22	6.8	(*)						64	99	26	29	44
23	6.5							*84	90	23	26	43
24	6.8							93	87	22	27	40
25	6.8							100	81	24	40	40
26	6.8							103	75	27	43	39
27	6.1							113	72	26	38	37
28	6.0							112	70	28	34	38
29	6.0							102	66	28	32	37
30	6.1							105	64	40	33	32
31	6.3							110	-----	63	33	-----
Total	228.7	210	124	93	84	124	210	1,499	2,931	1,155	1,151	1,328
Mean	7.38	7	4	3	3	4	7	48.4	97.7	37.3	37.1	44.3
Ac-ft	454	417	246	184	167	246	417	2,970	5,810	2,290	2,280	2,650

Calendar year 1960: Max 236 Min - Mean 28.6 Ac-ft 20,740  
Water year 1960-61: Max 138 Min - Mean 25.0 Ac-ft 18,110

Peak discharge (base, 150 cfs).--May 31 (8 p.m.) 156 cfs (3.63 ft); June 9 (9 p.m.) 222 cfs (3.86 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 28 to May 2 (stage-discharge relation affected by ice during most of period).

ARKANSAS RIVER BASIN

71

7-845. Lake Creek above Twin Lakes Reservoir, Colo.

Location--Lat 39°03'45", long 106°24'20", in sec.26, T.11 S., R.81 W., on left bank 1.5 miles upstream from high-water line of Twin Lakes Reservoir and 2 miles southwest of village of Twin Lakes.

Drainage area--75 sq mi.

Records available--April 1946 to September 1958, October 1959 to September 1961. Monthly discharge only for some periods, published in WSP 1241 and 1311.

Gage--Water-stage recorder. Altitude of gage is 9,300 ft (from topographic map). Prior to May 20, 1950, at site 190 ft downstream at different datum. May 20, 1950, to Apr. 7, 1953, at site 10 ft upstream at present datum.

Average discharge--14 years, 156 cfs (112,900 acre-ft per year).

Extremes--Maximum discharge during year, 1,320 cfs June 9 (gage height, 4.33 ft); minimum not determined.

1946-58, 1959-61: Maximum discharge, 3,150 cfs June 10, 1952 (gage height, 5.74 ft), from rating curve extended above 1,400 cfs; minimum not determined.

Note--The maximum discharge for the period of record was shown in WSP 1711 as being that for June 8, 1947 (2,580 cfs) instead of that for June 10, 1952.

Remarks--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Records include inflow from Roaring Fork in Colorado River basin through Twin Lakes tunnel (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 19-26)

0.8	18	2.0	175
1.0	31	2.5	310
1.2	48	3.0	500
1.4	70	4.0	1,040
1.7	118	5.0	1,950

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	21						37	1,050	334	192	114
2	33	23						53	920	310	218	109
3	33	25						86	734	310	222	125
4	32	24						134	532	310	188	127
5	32	24						123	552	286	161	136
6	30	22						107	595	274	142	*155
7	30	23						69	665	277	140	190
8	30	23						*58	*884	262	*146	242
9	30	23						48	1,020	248	146	348
10	30	22						100	1,030	222	129	436
11	30						14	102	986	195	122	388
12	28							159	962	155	122	345
13	26							195	932	*129	116	317
14	25							171	902	149	107	292
15	24							157	848	147	100	268
16	28		15	14	13	13		146	920	138	100	259
17	28							146	866	131	129	253
18	28							188	776	125	127	*256
19	28							283	722	120	116	298
20	28							408	716	122	109	286
21	28	19						15	396	698	138	125
22	28							16	*528	655	132	277
23	27							18	635	605	113	*104
24	26							18	704	536	104	280
25	25							16	818	520	100	271
26	*22							16	974	504	109	142
27	21							16	1,050	*432	107	125
28	21							16	1,030	396	102	111
29	21							18	980	370	116	102
30	19							26	1,000	352	159	107
31	20							1,020		210	122	
Total	845	610	465	434	364	403	455	11905	21680	5634	4108	7729
Mean	27.3	20.3	15	14	13	13	15.2	384	723	182	133	258
Ac-ft	1,680	1,210	922	861	722	799	902	23,610	43,000	11,170	8,150	15,330

Calendar year 1960: Max 1,470 Min - Mean 177 Ac-ft 128,700  
Water year 1960-61: Max 1,050 Min - Mean 150 Ac-ft 108,400

\* Discharge measurement made on this day.

Note--No gage-height record Nov. 11 to Apr. 21 (stage-discharge relation affected by ice during most of period).

## ARKANSAS RIVER BASIN

7-860. Arkansas River at Granite, Colo.

Location.--Lat 39°02'38", long 106°15'55", in SW  $\frac{1}{4}$  sec. 31, T.11 S., R.79 W., on right bank at Granite, a short distance east of U. S. Highway 24, 100 ft downstream from bridge, and 200 ft upstream from Cache Creek. Prior to Oct. 27, 1960, at site 168 ft downstream.

Drainage area.--427 sq mi.

Records available.--April to October 1895, May to December 1897, August to September 1898, March to October 1899, April to May 1901 (gage heights and discharge measurements only in 1895, 1899, and 1901), April 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 8,914.86 ft above mean sea level, datum of 1929. Prior to Apr. 6, 1910, staff gages near present site at different datums. Apr. 6, 1910, to Oct. 25, 1917, water-stage recorder or staff gage at site 832 ft upstream at different datum. Oct. 26, 1917, to Oct. 26, 1960, water-stage recorder at site 168 ft downstream at present datum.

Average discharge.--51 years (1910-61), 350 cfs (253,400 acre-ft per year).

Extremes.--Maximum discharge during year, 1,530 cfs June 10 (gage height, 4.22 ft), from rating curve extended above 1,100 cfs; minimum daily, 62 cfs Feb. 8.

1895, 1897-99, 1910-61: Maximum discharge, 5,360 cfs June 28, 1957 (gage height, 7.20 ft); minimum not determined.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions above station for irrigation of about 5,150 acres. Sugar Loaf and Twin Lakes Reservoirs are on tributaries above station (combined capacity, 70,680 acre-ft). Transmountain diversions from Colorado River basin to Arkansas River basin enter above this station (see elsewhere in this report).

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-26

Oct. 27 to Sept. 30

3.2	92	1.9	96	3.5	840
3.4	149	2.4	228	4.0	1,310
		3.0	480	4.2	1,510

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	117	118	85	78	73	72	73	198	1,350	558	849	670
2	123	114	88	78	74	72	84	213	1,340	498	867	577
3	114	114	88	76	70	72	90	231	1,110	455	867	328
4	114	114	84	76	72	72	94	238	460	450	813	360
5	109	114	80	76	70	72	90	292	440	570	804	405
6	112	107	78	76	66	72	88	332	660	552	678	420
7	134	109	78	76	64	72	88	266	921	564	670	395
8	106	111	78	78	62	72	90	259	1,020	558	694	420
9	109	b95	80	78	64	72	96	245	1,230	522	734	470
10	112	b90	80	78	66	72	100	245	1,450	498	710	504
11	106	b88	78	76	70	72	98	273	1,290	455	686	582
12	103	b88	78	76	72	72	100	308	1,180	308	621	614
13	103	b90	78	78	72	72	103	332	1,140	296	628	614
14	106	b90	76	78	72	74	105	300	1,170	380	546	516
15	114	b90	76	78	72	74	105	289	1,180	312	266	420
16	117	b82	74	78	72	74	110	245	839	255	238	516
17	123	b84	76	78	72	72	115	530	607	238	292	876
18	137	88	80	78	72	72	123	686	588	228	308	867
19	137	88	82	78	72	70	152	768	750	213	308	885
20	140	90	80	76	70	70	180	885	885	216	281	912
21	137	90	80	76	70	72	147	903	813	328	289	769
22	132	88	80	78	70	b74	137	1,010	840	304	273	470
23	129	88	80	78	70	b75	160	975	849	262	252	522
24	129	86	80	82	72	b76	147	1,030	777	468	312	516
25	129	86	80	84	72	76	130	1,110	768	582	694	486
26	129	88	78	84	70	74	123	1,150	678	576	734	470
27	114	84	78	80	70	74	120	1,310	425	614	718	465
28	125	80	76	78	70	74	132	1,320	734	628	670	445
29	123	82	76	78	-	74	152	1,130	694	621	642	445
30	116	84	76	80	-----	76	171	1,070	642	614	642	440
31	116	-----	76	80	-----	76	-----	1,220	-----	678	670	-----
Total	3,715	2,820	2,458	2,422	1,966	2,264	3,508	1,9363	2,6830	13,801	17,756	16,379
Mean	120	94.0	79.3	78.1	70.2	73.0	117	625	894	445	573	546
Ac-ft	7,370	5,590	4,880	4,800	3,900	4,490	6,960	38,410	53,220	27,370	35,220	32,490

Calendar year 1960: Max 2,190 Min 70 Mean 393 Ac-ft 285,000

Water year 1960-61: Max 1,450 Min 62 Mean 310 Ac-ft 224,700

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 18 to Mar. 21, Mar. 25 to Apr. 12 (stage-discharge relation affected by ice during most of periods), Apr. 14-17.

## 7-865. Clear Creek above Clear Creek Reservoir, Colo.

Location.--Lat 39°01'05", long 106°16'55", in S $\frac{1}{2}$  sec. 12, T.12 S., R.80 W., on left bank 0.5 mile upstream from water line (elevation 8,875 ft) of Clear Creek Reservoir and 2 miles southwest of Granite.

Drainage area.--59 sq mi.

Records available.--May 1946 to September 1961. Monthly discharge only for some periods, published in WSP 1241 and 1311.

Gage.--Water-stage recorder. Datum of gage is 8,889 ft above mean sea level (river-profile survey). Prior to Apr. 21, 1954, at site 200 ft downstream at datum 2.19 ft lower.

Average discharge.--15 years, 71.1 cfs (51,470 acre-ft per year).

Extremes.--Maximum discharge during year, 557 cfs June 8 (gage height, 2.93 ft), from rating curve extended above 350 cfs; minimum not determined.

1946-61: Maximum daily discharge, 1,300 cfs June 29, 1957; maximum gage height recorded, 4.34 ft June 16, 1952 (site and datum then in use); minimum discharge not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 250 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	11	1.4	102
.6	20	2.0	234
.9	44	3.0	585

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	24						23	369	126	63	49
2	27	24						28	341	118	76	46
3	27	24						33	302	108	113	53
4	26	23						39	240	104	82	53
5	27	23						37	237	101	70	58
6	25	23						32	265	102	62	*59
7	26	23						29	299	101	60	65
8	25	23					8.5	*26	*394	95	*60	76
9	26	b 23						30	445	88	58	118
10	26	b 24						36	408	83	55	153
11	26	*b 24						47	362	78	53	136
12	25	24						57	348	75	58	113
13	26	24						66	327	72	59	102
14	26	24						53	311	71	59	92
15	26	23						47	305	68	57	84
16	26	23	13	11	9	8		8.6	44	317	65	82
17	27	22						8.6	44	320	*62	73
18	29	22						9.2	50	302	59	*79
19	28	22						10	65	276	58	73
20	27	22						11	91	276	58	66
21	27	22						12	91	268	63	64
22	26	22						13	*153	254	60	98
23	26	22						13	211	234	55	*57
24	26	22						14	208	218	51	54
25	25	21						13	296	196	51	55
26	*25	21						14	327	196	50	59
27	25	20						14	314	*165	51	55
28	24	18						15	327	156	55	50
29	25	17						16	296	145	59	46
30	25	*16						18	330	140	57	46
31	24	-----						338	-----	60	50	-----
Total	808	665	403	341	252	248	316.9	3,768	8,416	2,304	1,936	2,550
Mean	26.1	22.2	13	11	9	8	10.6	122	281	74.3	62.5	85.0
Ac-ft	1,600	1,320	799	676	500	492	629	7,470	16,690	4,570	3,840	5,060

Calendar year 1960: Max 481 Min - Mean 64.7 Ac-ft 46,980

Water year 1960-61: Max 445 Min - Mean 60.3 Ac-ft 43,650

Peak discharge (base, 400 cfs).--June 1 (1 a.m.) 418 cfs (2.58 ft); June 8 (12 p.m.) 557 cfs (2.93 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 12 to Apr. 21 (stage-discharge relation affected by ice during most of period), May 9-12.



# ARKANSAS RIVER BASIN

74

7-890. Cottonwood Creek below Hot Springs, near Buena Vista, Colo.

Location.--Lat 38°48'46", long 106°13'18", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.21, T.14 S., R.79 W., on left bank a quarter of a mile downstream from Cottonwood Hot Springs, 1 mile downstream from confluence of Middle Cottonwood and South Cottonwood Creeks, 3 miles upstream from North Cottonwood Creek, and  $\frac{5}{2}$  miles southwest of Buena Vista.

Drainage area.--65 sq mi.

Records available.--October 1910 to September 1923, August 1949 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 8,532 ft (river-profile survey). Prior to Oct. 1, 1923, staff gage near present site at different datum.

Average discharge.--25 years, 58.9 cfs (42,640 acre-ft per year).

Extremes.--Maximum discharge during year, 305 cfs June 1 (gage height, 2.30 ft); minimum 13 cfs Mar. 8; minimum gage height, 1.24 ft May 1.

1910-23, 1949-61: Maximum discharge, 1,180 cfs July 1, 1957 (gage height, 4.52 ft, from floodmarks), from rating curve extended above 690 cfs; minimum observed, 10 cfs Mar. 20-23, 25, Apr. 9, 19, 1914.

Remarks.--Records good. Several small diversions above station for irrigation.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 9-18)

Oct. 1 to Apr. 18				Apr. 19 to Sept. 30			
1.4	15	1.3	20	1.7	66		
1.5	22	1.5	38	1.9	126		
1.6	31	1.6	49	2.2	250		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	26	22	20	17	16	17	26	235	83	54	48
2	27	25	21	20	17	16	17	28	230	77	64	45
3	26	25	20	19	17	16	18	*30	188	72	80	54
4	*27	24	22	20	17	16	19	33	143	66	64	47
5	26	23	22	20	17	16	*19	28	160	66	58	48
6	27	24	*22	20	17	16	18	26	160	72	51	*61
7	26	24	22	20	17	*16	19	25	*180	72	51	66
8	26	24	22	20	*17	17	19	24	200	74	52	72
9	26	24	22	20	18	17	18	24	215	77	*46	94
10	26	23	22	*20	18	16	21	26	225	77	46	91
11	25	23	22	18	17	16	21	31	205	*77	46	72
12	25	21	22	18	17	16	21	35	196	80	46	64
13	25	20	21	18	17	17	22	36	188	77	47	59
14	26	21	21	18	17	17	22	30	176	74	48	58
15	26	22	21	18	17	17	22	28	168	74	47	58
16	26	23	21	18	17	17	22	27	160	64	47	58
17	26	23	21	18	17	17	22	26	160	64	48	58
18	*27	22	21	18	17	17	22	30	157	61	49	58
19	26	22	21	18	16	16	26	36	143	59	48	63
20	26	23	21	17	17	16	28	47	*146	59	47	66
21	26	23	21	17	17	16	26	49	143	66	45	64
22	27	*23	22	17	17	16	26	72	136	69	45	72
23	28	23	21	17	17	17	26	*116	126	59	46	77
24	28	23	21	18	17	17	26	113	120	56	46	69
25	28	22	21	18	16	17	26	126	116	56	51	64
26	27	22	21	18	17	18	26	140	110	56	49	63
27	26	22	21	18	17	19	26	160	104	54	47	61
28	27	22	21	18	16	18	24	184	100	54	46	63
29	27	22	21	18	-	18	25	168	94	54	45	63
30	25	22	20	17	-----	17	28	215	88	52	45	63
31	26	-----	20	17	-----	16	-----	230	-----	52	47	-----
Total	817	686	659	571	475	517	672	2,169	4,772	2,053	1,551	1,899
Mean	26.4	22.9	21.3	18.4	17.0	16.7	22.4	70.0	159	66.2	50.0	63.3
Ac-ft	1,620	1,360	1,310	1,130	942	1,030	1,330	4,300	9,470	4,070	3,080	3,770

Calendar year 1960: Max 303 Min 17 Mean 48.1 Ac-ft 34,920  
Water year 1960-61: Max 235 Min 16 Mean 46.1 Ac-ft 33,410

Peak discharge (base, 300 cfs).--June 1 (1 p.m.) 305 cfs (2.30 ft).

\* Discharge measurement made on this day.

ARKANSAS RIVER BASIN

75

7-915. Arkansas River at Salida, Colo.

Location.--Lat 38°32'45", long 106°00'36", in NE¼ sec.31, T.50 N., R.9 E., on right bank at Salida, 450 ft upstream from bridge (relocated) on State Highway 291 and 2.7 miles upstream from South Arkansas River.

Drainage area.--1,218 sq mi.

Records available.--April to October 1895, May to December 1897, August 1898 to September 1899, April to October 1900, April 1901 to October 1903, October 1909 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 7,050.45 ft above mean sea level, datum of 1929. Apr. 11, 1895, to Nov. 18, 1903, staff gage and Nov. 3, 1909, to Dec. 2, 1936, water-stage recorder at site 1½ miles downstream at different datum. Dec. 3, 1936, to Dec. 5, 1957, water-stage recorder at same site at datum 1.00 ft higher.

Average discharge.--55 years (1898-99, 1901-3, 1909-61), 619 cfs (448,100 acre-ft per year).

Extremes.--Maximum discharge during year, 3,120 cfs Aug. 11 (gage height, 3.80 ft); minimum daily, 183 cfs Feb. 7. 1895-1903, 1909-61: Maximum discharge, 9,220 cfs June 29, 1957 (gage height, 7.82 ft, present datum); minimum observed, 100 cfs Oct. 4, 6, 7, 1898.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain diversions (see elsewhere in this report), storage reservoirs (combined capacity, 81,890 acre-ft), diversions for irrigation of about 16,000 acres above station, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 16-24, June 21-29, Aug. 12-24, Sept. 3-11)

0.2	175	2.0	1,240
.5	265	3.0	2,120
1.0	530	4.0	3,430

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	288	343	258	243	200	234	209	274	2,260	1,020	1,090	842
2	288	343	258	240	195	237	209	296	2,250	926	1,140	828
3	292	343	262	228	200	237	209	283	2,070	891	1,320	744
4	288	343	274	223	205	237	224	321	1,030	793	1,260	730
5	288	288	240	224	190	237	251	338	772	828	1,160	744
6	296	274	244	224	185	234	215	404	856	905	995	835
7	292	262	243	227	183	237	215	404	1,480	877	919	800
8	288	259	240	230	215	237	212	343	1,650	884	940	793
9	274	254	245	237	224	234	209	343	1,930	842	947	926
10	283	254	250	234	224	240	218	332	2,400	786	926	975
11	274	292	249	230	227	240	209	332	2,310	730	1,000	1,090
12	274	254	235	227	230	240	206	387	2,110	625	828	1,060
13	274	278	224	224	230	237	209	470	1,970	530	870	1,060
14	278	274	237	223	227	237	212	458	1,950	584	891	898
15	301	283	221	228	227	237	212	426	1,970	560	653	828
16	321	254	214	222	230	244	215	398	1,830	470	480	715
17	354	265	219	221	234	244	212	420	1,400	436	497	1,050
18	392	274	240	221	234	234	218	772	1,380	426	542	1,120
19	387	265	252	224	227	230	230	807	1,420	426	524	1,140
20	370	274	248	218	224	224	283	1,020	1,680	392	519	1,180
21	370	265	235	215	227	234	278	1,050	1,580	431	486	1,200
22	376	265	232	218	230	212	237	1,170	1,540	542	480	856
23	354	262	230	218	230	218	251	1,310	1,540	475	464	898
24	348	258	234	220	224	221	248	1,280	1,460	480	387	905
25	348	274	237	229	224	221	230	1,500	1,430	765	653	891
26	348	288	236	232	234	215	221	1,690	1,380	772	905	884
27	354	306	234	225	230	209	218	1,890	1,070	800	870	800
28	354	262	233	210	227	212	224	2,030	1,160	828	835	765
29	354	258	235	205	-	215	237	1,870	1,180	828	807	765
30	338	258	238	210	-----	206	258	1,730	1,100	828	779	765
31	338	-----	240	205	-----	212	-----	1,860	-----	877	828	-----
Total	9984	8371	7437	6940	6137	7106	6779	26208	48158	21557	24996	27083
Mean	322	279	240	224	219	229	226	845	1,605	695	806	903
Ac-ft	19,800	16,600	14,750	13,770	12,170	14,090	13,450	51,980	95,520	42,760	49,580	53,730

Calendar year 1960: Max 2,940 Min 170 Mean 620 Ac-ft 450,100  
Water year 1960-61: Max 2,400 Min 183 Mean 550 Ac-ft 398,200

Note.--Stage-discharge relation affected by ice Dec. 7-12, Dec. 16 to Jan. 1, Jan. 3-5, 14-16, Jan. 24 to Feb. 7 (no gage-height record Dec. 16-31).

## ARKANSAS RIVER BASIN

7-937. Arkansas River near Wellsville, Colo.

Location--Lat 38°30'10", long 105°56'21", in NE $\frac{1}{4}$  sec. 14, T.49 N., R.9 E., on right bank 50 ft upstream from Chaffee-Fremont County line, 2 miles northwest of Wellsville, 2.8 miles downstream from South Arkansas River, and 3.5 miles southeast of Salida.

Drainage area--1,485 sq mi.

Records available--April to September 1961.

Gage--Water-stage recorder. Datum of gage is 6,896.73 ft above mean sea level (State Highway Department bench mark).

Extremes--Maximum discharge during water year, 2,650 cfs Aug. 11 (gage height, 6.18 ft); minimum daily during period April to September, 190 cfs Apr. 12.

Remarks--Records good except those for periods of no gage-height record, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, diversions for irrigation of about 24,000 acres, and return flow from irrigated areas.

Rating table, Apr. 1 to Sept. 30, 1961 (gage height, in feet,  
and discharge, in cubic feet per second)

2.7	170	4.0	630
3.0	250	5.0	1,340
3.5	420	6.0	2,420

Discharge, in cubic feet per second, April to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							215	280	2,300	961	1,060	870
2							212	300	2,370	884	1,110	842
3							210	*301	2,180	870	1,290	835
4							*244	331	1,110	780	1,230	807
5							280	345	821	800	1,130	842
6							250	408	849	880	960	*947
7							229	404	*1,530	870	900	856
8							226	348	1,650	880	910	877
9							208	345	1,950	840	*877	1,020
10							226	342	2,420	790	856	1,060
11							200	342	2,290	*730	941	1,140
12							190	404	2,110	621	835	1,100
13							198	496	1,960	528	863	1,110
14							200	484	1,950	567	905	961
15							198	448	1,970	567	686	877
16							198	432	1,830	468	512	776
17							198	436	1,350	440	504	1,080
18							*210	764	1,300	424	540	1,180
19							238	807	1,400	416	532	*1,200
20							289	996	1,600	384	520	1,200
21							280	1,060	*1,460	412	492	1,240
22							230	1,200	1,450	532	484	900
23							240	*1,360	1,460	476	*484	910
24							230	1,320	1,350	456	484	920
25							220	1,560	1,330	728	724	900
26							210	1,790	1,260	746	1,000	890
27							210	1,960	975	782	947	850
28							210	2,120	1,030	807	912	790
29							230	1,920	1,090	800	856	790
30							260	1,790	1,020	782	856	790
31								1,870		800	863	
Total							6,739	26,963	4,7365	21,021	25,263	28,560
Mean							225	870	1,579	678	815	952
Ac-ft							13,370	53,480	93,950	41,690	50,110	56,650

Calendar year 1960: Max - Min - Mean - Ac-ft -  
Water year 1960-61: Max - Min - Mean - Ac-ft -

\* Discharge measurement made on this day.

Note.--No gage-height record Apr. 21 to May 2, May 22, June 14-19, July 4-11, Aug. 6-8, Sept. 18-30.

7-950. Grape Creek near Westcliffe, Colo.

Location.--Lat 38°10'47", long 105°29'19", in NW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.36, T.21 S., R.73 W., on left bank 0.5 mile upstream from Swift Creek and 3.2 miles northwest of Westcliffe.

Drainage area.--320 sq mi.

Records available.--October 1924 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,705 ft (from topographic map). Prior to Aug. 19, 1938, at site 10 ft upstream at same datum.

Average discharge.--37 years, 32.4 cfs (23,460 acre-ft per year).

Extremes.--Maximum discharge during year, 840 cfs Apr. 3 (gage height, 3.39 ft), from rating curve extended above 140 cfs; minimum not determined.

1924-61: Maximum discharge, 1,960 cfs Apr. 23, 1942 (gage height, 5.26 ft), from rating curve extended above 830 cfs; minimum daily, 0.1 cfs June 19-22, 1936.

Remarks.--Records good except those for period of no gage-height record, which are poor. Diversions above station for irrigation of about 15,000 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.5	0.7	28	1.6	180
.5	8.0	1.0	64	2.0	290
.6	17	1.3	110	2.5	460

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4						45	28	68	55	40	46
2	7.4						72	*30	67	54	71	40
3	8.0						*278	27	68	50	71	64
4	8.0						425	24	61	40	72	103
5	8.0						139	24	49	44	58	227
6	7.4						74	20	43	*52	43	188
7	7.4						51	16	37	44	36	91
8	7.4					20	41	20	38	60	*37	79
9	7.4						44	19	*51	91	34	81
10	7.4						*70	13	72	64	32	89
11	7.4	(*)		(*)			114	12	86	51	30	97
12	8.0						166	15	88	54	64	96
13	8.0						117	19	71	*50	56	84
14	*8.0						63	55	70	43	125	79
15	12						49	47	296	44	72	72
16		24	10	6	9		56	31	196	37	88	67
17							50	21	203	*34	*85	64
18							50	19	149	31	101	*60
19							54	18	*146	31	78	67
20							*62	16	206	27	63	67
21							70	19	154	32	55	63
22							*81	20	154	43	51	61
23							99	25	139	30	63	61
24	45						106	*46	125	26	47	59
25							86	56	105	22	51	56
26				(*)			63	28	149	84	24	52
27							51	26	99	74	24	49
28							39	25	96	74	24	46
29							34	24	106	63	55	41
30							35	25	101	52	45	37
31							36	89	-----	37	*54	-----
Total	839.2	720	310	186	252	1,272	2,377	1,280	3,089	1,318	1,926	2,286
Mean	27.1	24	10	6	9	41.0	79.2	41.3	103	42.5	62.1	76.2
Ac-ft	1,660	1,430	615	369	500	2,520	4,710	2,540	6,130	2,610	3,820	4,530

Calendar year 1960: Max 170 Min 5.2 Mean 30.6 Ac-ft 22,220  
 Water year 1960-61: Max 425 Min - Mean 43.4 Ac-ft 31,430

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-3	12p.m.	3.39	840	6-15	6:30p.m.	2.34	390
4-12	8p.m.	2.17	334	9-5	11p.m.	2.17	338

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 15 to Mar. 20 (stage-discharge relation affected by ice during most of period).



## ARKANSAS RIVER BASIN

7-960. Arkansas River at Canon City, Colo.

Location.--Lat 38°26', long 105°15', in sec.32, T.18 S., R.70 W., on right bank in Canon City, 800 ft upstream from Sand Creek.

Drainage area.--3,117 sq mi.

Records available.--January 1888 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Published as "near Canyon" 1900-1906.

Gage.--Water-stage recorder. Datum of gage is 5,342.87 ft above mean sea level, datum of 1929. Prior to Mar. 27, 1922, staff gage, chain gage, or water-stage recorder at sites about a quarter of a mile upstream at various datums. Mar. 27, 1922, to Sept. 30, 1957, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--73 years, 719 cfs (520,500 acre-ft per year).

Extremes.--Maximum discharge during year, 4,370 cfs Aug. 11 (gage height, 4.94 ft), from rating curve extended above 2,400 cfs; maximum gage height, 6.18 ft Dec. 7 (backwater from ice); minimum daily discharge, 170 cfs Apr. 29. 1888-1961: Maximum discharge, 19,000 cfs Aug. 2, 1921 (gage height, 10.7 ft, site and datum then in use, from floodmark), from rating curve extended above 5,000 cfs; minimum daily, 69 cfs May 13, 1959.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, diversions for irrigation of about 53,000 acres, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 7-12, 16-18, 20-22, Sept. 11-16)

0.2	157	2.0	910
.5	215	3.0	1,680
1.0	360	4.0	2,640
1.5	570		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	195	276	312	305	325	270	354	195	2330	1080	1110	833
2	187	276	324	290	315	300	327	215	2530	980	1430	798
3	195	273	315	290	290	312	345	218	2430	917	1630	1020
4	199	273	321	310	270	312	381	238	1610	847	1600	917
5	201	258	297	320	270	315	484	261	903	791	1440	1060
6	197	252	235	315	265	312	443	240	833	931	1330	1190
7	209	270	220	310	260	282	392	270	1300	938	1040	1140
8	209	276	235	315	260	276	339	246	1660	917	1060	1120
9	199	276	260	320	270	267	297	207	1890	1010	1020	1170
10	193	267	260	290	280	282	294	207	2360	910	1010	1280
11	197	273	280	295	300	282	306	203	2510	784	1250	1340
12	189	288	300	300	309	291	273	211	2220	721	1250	1430
13	189	282	300	290	291	306	258	306	2060	545	1080	1400
14	193	315	300	270	282	309	273	411	2010	506	1220	1320
15	238	318	300	280	276	370	264	374	2170	555	1120	1170
16	303	312	310	295	279	427	261	357	2200	484	777	1070
17	351	309	320	300	288	447	261	342	1780	447	812	1060
18	455	315	325	300	294	443	258	572	1640	381	763	1320
19	475	318	320	285	282	419	273	819	1590	360	770	1340
20	415	321	305	275	270	407	339	959	1710	348	679	1370
21	378	315	270	290	273	411	321	1140	1750	330	624	1350
22	364	318	300	305	285	384	288	1170	1670	423	560	1160
23	357	309	310	310	294	384	252	1360	1660	443	565	1000
24	330	303	320	305	255	367	258	1330	1610	370	545	1040
25	321	300	325	310	267	381	235	1460	1530	506	488	1030
26	321	300	310	275	291	403	218	1790	1460	707	1010	973
27	315	309	280	265	303	378	189	1950	1260	1060	1200	910
28	309	324	275	260	291	360	171	2140	1020	847	1070	854
29	306	270	290	280	-	381	170	2080	1200	903	889	798
30	294	324	325	310	-----	399	179	1920	1120	868	840	791
31	285	-----	330	320	-----	399	-----	1960	-----	945	826	-----
Total	8569	8820	9174	9185	7935	10876	8703	25151	52016	21854	31008	33254
Mean	276	294	296	296	283	351	290	811	1,734	705	1,000	1,108
Ac-ft	17,000	17,490	18,200	18,220	15,740	21,570	17,260	49,890	103,200	43,350	61,500	65,960

Calendar year 1960: Max 3,700 Min 187 Mean 663 Ac-ft 481,400  
Water year 1960-61: Max 2,530 Min 170 Mean 621 Ac-ft 449,400

Note.--No gage-height record Dec. 9, 30, Jan. 1-11, 20-24, 27-30 (stage-discharge relation affected by ice during most of periods), July 17. Stage-discharge relation affected by ice Dec. 6-8, 10-29, 31, Jan. 12-19, 25, 26, Jan. 31 to Feb. 11.

7-995. Arkansas River near Pueblo, Colo.

Location.--Lat 38°16'00", long 104°39'00", in sec.34, T.20 S., R.65 W., on right bank at intake of south-side waterworks, 1 mile upstream from Dry Creek and 2½ miles west of city hall in Pueblo.

Drainage area.--4,686 sq mi.

Records available.--May to June 1885, January 1886 to December 1887, May to August 1889, September 1894 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Published as "at Rock Canyon" 1889 and as "at Pueblo" 1885-87, 1894-1924.

Gage.--Water-stage recorder and concrete control on river; water-stage recorder and Parshall flume at north-side waterworks intake. Datum of river gage is 4,689.82 ft above mean sea level, datum of 1929. May 16, 1885, to Sept. 12, 1886, staff gage at site 2½ miles downstream; June 1, 1887, to Aug. 31, 1889, staff gage at site 6½ miles upstream; and Sept. 19, 1894, to May 25, 1925, staff gage, chain gage, or water-stage recorder about 2½ miles downstream at various sites and datums.

Average discharge.--68 years (1886-87, 1894-1961), 715 cfs (517,600 acre-ft per year).

Extremes.--Maximum discharge during year, 5,760 cfs Aug. 2; minimum daily, 47 cfs Apr. 30.

1885-87, 1889, 1894-1961: Maximum discharge, 103,000 cfs June 3, 1921 (gage height, 24.66 ft, site and datum then in use), from rating curve extended above 6,800 cfs on basis of float measurement at gage height 11.2 ft and slope-area measurement of peak flow; minimum daily, 18 cfs (including 13 cfs diverted into intake of north-side waterworks) Apr. 7, 1935.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements made at least twice a month. Records include water diverted above station into intake of north-side waterworks for municipal supply of Pueblo but not water diverted by southside waterworks. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, diversions above station for irrigation of about 88,000 acres, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	246	272	b 299	275	226	217	58	1,840	977	1,250	899
2	114	247	271	319	281	227	197	84	2,260	910	1,680	876
3	96	251	277	297	281	233	252	96	a 2,380	788	a 2,220	1,200
4	92	248	290	304	287	257	a 264	123	2,200	744	a 1,510	1,150
5	84	243	b 298	332	281	263	a 384	166	1,080	711	a 1,300	1,100
6	78	232	b 255	309	281	251	384	204	813	744	1,240	1,210
7	87	232	b 274	288	263	239	367	184	889	843	a 1,120	1,230
8	105	237	b 287	302	257	232	339	210	1,430	689	a 1,060	1,200
9	110	222	290	288	275	212	303	174	1,660	1,580	a 1,080	1,180
10	99	232	347	316	287	207	276	135	2,000	744	a 1,140	1,340
11	88	232	347	374	301	192	302	121	2,420	767	1,180	1,400
12	93	248	338	309	301	212	283	92	2,200	856	2,000	1,500
13	92	236	331	295	294	217	193	97	1,920	470	1,390	1,260
14	102	230	282	309	287	201	187	329	1,790	488	1,540	1,240
15	168	246	278	302	281	212	202	430	1,970	645	1,260	1,120
16	233	234	b 269	316	281	254	197	365	2,130	533	842	1,200
17	274	225	304	337	282	316	187	322	1,830	394	734	1,070
18	861	254	330	344	282	352	167	252	1,530	326	833	1,360
19	487	286	352	336	270	344	162	528	1,440	280	888	1,330
20	420	300	345	358	246	316	181	682	1,480	264	711	1,470
21	345	296	324	330	208	309	294	892	1,580	282	766	1,380
22	318	292	337	329	187	269	216	936	1,470	337	667	1,320
23	318	285	295	329	195	233	168	1,140	1,420	390	645	1,030
24	324	296	289	322	210	222	172	1,260	1,370	351	633	1,100
25	295	308	282	330	189	207	180	1,240	1,290	276	667	1,080
26	285	301	302	346	210	212	198	1,640	1,170	510	899	950
27	287	320	323	339	249	202	111	1,760	1,150	794	1,070	850
28	270	319	b 299	276	242	207	80	1,880	965	1,360	1,390	762
29	271	291	b 311	283	-	233	55	1,980	1,000	892	977	684
30	258	254	b 330	287	-----	227	47	1,760	1,010	1,090	888	662
31	258	-----	b 320	269	-----	217	-----	1,700	-----	836	910	-----
Total	7,015	7,843	9,449	9,774	7,283	7,501	6,565	20,840	47,687	20,871	34,490	34,153
Mean	226	261	305	315	260	242	219	672	1,590	673	1,113	1,138
Ac-ft	13,910	15,560	18,740	19,390	14,450	14,880	13,020	41,340	94,590	41,400	68,410	67,740

Calendar year 1960: Max 3,270 Min 78 Mean 587 Ac-ft 426,400

Water year 1960-61: Max 2,420 Min 47 Mean 585 Ac-ft 423,400

a No gage-height record.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-1037. Fountain Creek near Colorado Springs, Colo.

Location.--Lat 38°51'17", long 104°52'39", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.3, T.14 S., R.67 W., on left bank 200 ft upstream from diversion to city of Colorado Springs, half a mile east of bridge on U. S. Highway 24 near west city limits of Colorado Springs, and 1 mile downstream from Sutherland Creek.

Drainage area.--102 sq mi.

Records available.--April 1958 to September 1961.

Gage.--Water-stage recorder and Parshall flume with overflow weirs. Altitude of gage is 6,110 ft (from topographic map).

Extremes.--Maximum discharge during year, 955 cfs July 11 (gage height, 4.27 ft in gage well), from rating curve extended above 50 cfs on basis of slope-area measurement at gage height 3.87 ft; minimum daily, 2.9 cfs Nov. 29.  
1958-61: Maximum discharge, that of July 11, 1961; minimum daily, 2.9 cfs Nov. 29, 1960.

Remarks.--Records fair prior to June 2 and poor thereafter. Natural flow of stream affected by storage reservoirs, power developments, diversions for irrigation and municipal use, and at times, transbasin diversion from Beaver Creek drainage and transmountain diversions from Colorado River basin.

Rating table, water year 1960-61 (gage height, in feet, and  
discharge, in cubic feet per second)  
(Shifting-control method used Mar. 1-13, June 3 to Sept. 30)

0.4	2.9	0.8	8.5	2.3	44
.5	4.0	1.0	12	2.5	60
.6	5.4	2.0	35	3.0	145

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	7.2	7.3	5.1	6.6	5.7	7.5	9.1	9.6	40	32	16
2	6.0	8.1	7.8	5.4	5.0	5.8	7.6	*9.1	17	24	52	15
3	*7.3	8.0	7.8	7.5	5.1	5.4	9.1	9.0	35	17	41	38
4	6.4	7.6	8.3	7.6	4.8	5.0	13	10	24	17	27	31
5	7.0	7.6	*5.1	6.1	4.6	3.1	12	10	22	39	18	*35
6	6.1	7.5	6.4	6.1	3.7	*5.0	9.6	10	*21	26	16	38
7	4.3	7.8	7.3	6.1	*4.6	5.1	*9.1	10	19	60	*13	33
8	5.0	7.6	7.3	5.8	6.0	4.8	8.6	10	17	58	17	27
9	5.0	7.3	7.5	*6.7	5.7	5.4	8.3	9.6	17	36	20	28
10	6.7	7.8	7.2	6.3	5.0	6.1	9.1	11	22	27	15	26
11	6.6	8.1	7.5	5.7	5.1	5.8	9.0	9.8	41	*103	110	34
12	6.7	8.0	6.4	5.8	4.8	5.4	8.3	9.8	39	*32	32	35
13	6.1	8.1	6.9	5.7	4.8	5.1	8.8	13	34	30	31	33
14	5.8	7.5	6.6	5.0	4.6	6.6	8.8	12	38	28	36	35
15	6.4	7.2	6.6	6.3	4.6	6.7	7.5	14	43	28	30	31
16	6.1	6.1	4.3	6.1	5.1	6.7	8.1	11	37	21	26	28
17	*9.3	6.9	6.7	5.5	4.7	6.6	8.0	9.5	30	22	44	27
18	24	6.7	7.6	5.4	4.4	6.6	8.8	11	22	24	37	24
19	12	6.7	6.9	4.0	4.6	6.3	11	11	22	23	28	27
20	11	6.7	5.8	5.7	4.4	6.4	12	11	36	23	20	46
21	11	6.6	5.7	6.0	5.0	6.4	12	13	26	24	11	31
22	8.5	6.6	6.9	6.9	5.0	6.3	12	11	23	25	11	30
23	8.5	6.1	6.4	6.0	4.7	6.4	12	11	20	21	15	37
24	8.1	6.9	6.1	5.4	4.3	6.7	11	11	20	21	16	39
25	7.2	6.7	6.1	6.4	5.0	6.9	11	12	16	23	16	36
26	7.8	6.6	5.7	4.4	3.9	7.0	9.6	11	15	26	14	29
27	8.1	6.4	5.1	5.1	5.0	7.0	9.1	9.8	13	28	28	24
28	8.0	3.3	5.0	5.8	4.6	7.8	8.6	9.3	13	25	23	26
29	7.6	2.9	5.1	6.7	-	7.2	8.5	9.1	16	22	16	25
30	7.6	8.3	6.1	7.5	-----	7.5	8.6	12	20	24	17	25
31	7.8	-----	5.4	9.3	-----	7.6	-----	11	-----	22	29	-----
Total	244.9	208.9	200.9	187.4	135.7	190.4	286.6	330.1	727.6	939	841	909
Mean	7.90	6.96	6.48	6.05	4.85	6.14	9.55	10.6	24.3	30.3	27.1	30.3
Ac-ft	486	414	398	372	269	378	568	655	1,440	1,860	1,670	1,800

Calendar year 1960: Max 31 Min 2.9 Mean 10.1 Ac-ft 7,370  
Water year 1960-61: Max 110 Min 2.9 Mean 14.3 Ac-ft 10,310

Peak discharge (base, 150 cfs)

\* Discharge measurement made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-1	9p.m.	3.69	456	8-1	9:30p.m.	2.54	155
7-5	1p.m.	3.03	244	8-2	8p.m.	3.24	359
7-7	3:30p.m.	3.75	560	8-11	4p.m.	4.15	880
7-8	7p.m.	3.33	432	9-19	7:30p.m.	3.17	334
7-11	12m	4.27	955				

7-1039. West Monument Creek near Pikeview, Colo.

Location.--Lat 38°58'17", long 104°53'56", in SW $\frac{1}{4}$  sec.28, T.12 S., R.67 W., on right bank in Air Force Academy Reservation, 4 miles upstream from mouth and 11 $\frac{1}{2}$  miles northwest of Pikeview.

Drainage area.--15.4 sq mi.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 7,080.78 ft (City of Colorado Springs bench mark).

Extremes.--Maximum discharge during year, 19 cfs Aug. 2 (gage height, 1.34 ft); no flow for many days.

1957-61: Maximum discharge, 27 cfs about May 14, 1958 (gage height, 1.59 ft); no flow for many days in each year.

Remarks.--Records fair. Natural flow of stream affected by storage reservoirs (combined capacity, 1,520 acre-ft) and diversions for municipal use.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.0	0	0.3	1.8
.1	.2	.5	4.0
.2	1.0	.7	6.9

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0					0	**0	0.1	0	1.0	0.4
2	0	0					0	0	0	.2	4.0	.5
3	**0	0					0	0	1.5	0	6.0	1
4	0	0					2.2	0	2.1	0	5.2	1.5
5	0	0	(*)				1.3	0	1.4	0	4.6	*2.4
6	0	0			(*)	(*)	*2.4	0	*1.0	0	3.6	3.1
7	0	0					.9	0	.8	0	*2.1	3.4
8	0	0					0	0	.6	0	1.9	3.3
9	0	.1		(*)			.1	0	.2	0	1.8	3.1
10	0	0					0	0	.3	0	1.4	2.8
11	0	0					0	.3	.6	0	1.2	2.6
12	0	0					0	.1	.5	*0	1.0	2.2
13	0	0					0	0	.6	0	.9	1.9
14	0	0					0	0	.7	0	1.6	1.8
15	0	0					0	0	1.0	.1	.9	1.6
16	0	.3					0	0	1.0	0	1.0	1.5
17	**0	.4					0	0	.8	0	.9	1.4
18	0	.2					0	0	.3	0	.8	3.4
19	0	0					.1	0	.2	0	.3	4.3
20	0	0					.2	0	1.0	0	1	3.2
21	.1	0					.1	0	1.1	0	1	1.6
22	5.1	0					.2	0	4.0	0	1	1.3
23	3.1	0					.3	0	2.6	0	1	1.2
24	.1	0					.1	0	1.5	0	0	1.4
25	0	0					0	0	1	0	.1	1.3
26	0	0					0	0	0	1.3	.2	1.2
27	0	0					0	0	0	.8	.2	1.1
28	0	0					0	0	.1	0	.2	1.0
29	0	0					0	0	0	0	.2	.9
30	0	0					0	0	0	0	2.2	.8
31	0	-----			-----		-----	0	-----	.1	1.1	-----
Total	8.5	1.0	0	0	0	0	7.9	0.4	24.1	2.5	44.8	57.2
Mean	0.27	0.03	0	0	0	0	0.26	0.01	0.80	0.08	1.45	1.91
Ac-ft	17	2.0	0	0	0	0	16	0.8	48	5.0	89	113

Calendar year 1960: Max 6.7 Min 0 Mean 0.52 Ac-ft 377  
 Water year 1960-61: Max 6.0 Min 0 Mean 0.40 Ac-ft 291

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Dec. 5 to Apr. 3, Sept. 2, 3.



## ARKANSAS RIVER BASIN

7-1045. Templeton Gap Floodway at Colorado Springs, Colo.

Location.--Lat 38°53'17", long 104°49'01", in SE $\frac{1}{4}$  sec.30, T.13 S., R.66 W., on left bank 75 ft upstream from mouth of concrete flume, 400 ft upstream from bridge on U. S. Highways 85 and 87, and three-quarters of a mile north of Colorado Springs.

Drainage area.--8.46 sq mi.

Records available.--July 1951 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 6,200 ft (from topographic map).

Average discharge.--10 years, 0.12 cfs (87 acre-ft per year).

Extremes.--Maximum discharge during year, 280 cfs June 3 (gage height, 2.30 ft), from rating curve based on computation as explained below; no flow for most of year.

1951-61: Maximum discharge, 458 cfs July 2, 1956 (gage height, 2.63 ft), from rating curve based on computation of flow at critical depth at gage heights 1.3, 1.4, 1.8, and 3.0 ft; no flow for most of time.

Remarks.--Records good. Observation of no flow generally made once a month. This is an artificial channel constructed to divert flood flows from normally dry channels around Colorado Springs during periods of heavy rainfall.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

1.2	0
1.3	.6
1.4	9.0
1.5	22
1.6	39

Discharge, in cubic feet per second, water year October 1960 to September 1961

June 3.....	38	Aug. 2.....	0.1
4.....	17	3.....	.2
5.....	1.0	11.....	.3
July 1.....	3.2	13.....	.1
2.....	.3		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June.....	56.0	38	0	1.87	111
July.....	3.5	3.2	0	.11	6.9
August.....	.7	.3	0	.02	1.4
Calendar year 1960....	1.1	1.0	0	.003	2.2
Water year 1960-61....	60.2	38	0	.16	119

Note.--Flow occurred only on days listed above.

7-1065. Fountain Creek at Pueblo, Colo.

Location.--Lat 38°16'20", long 104°35'40", in SW<sup>1</sup> sec.30, T.20 S., R.64 W., on left bank at downstream side of Eighth Street Bridge in Pueblo, 2 miles upstream from mouth.

Drainage area.--926 sq mi.

Records available.--January 1922 to September 1925, October 1940 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 4,663.45 ft above mean sea level, datum of 1929. Prior to Feb. 13, 1923, staff gage at site half a mile upstream at different datum. Feb. 13 to July 11, 1923, staff gage and July 12, 1923, to Sept. 30, 1925, water-stage recorder, within 200 ft of present site at various datums.

Average discharge.--24 years, 52.9 cfs (38,300 acre-ft per year).

Extremes.--Maximum discharge during year, 6,200 cfs Aug. 11 (gage height, 6.40 ft), from rating curve extended above 190 cfs on basis of float-area measurements at gage heights 8.00 and 9.00 ft; no flow May 22, 27-31.

1922-25, 1941-61: Maximum discharge, 17,800 cfs July 10, 1945 (gage height, 9.50 ft), from rating curve extended above 2,400 cfs on basis of slope-area measurement at gage height 8.05 ft; no flow at times.

Flood of June 4, 1921, discharge, 34,000 cfs, by slope-area measurement of peak flow. Flood of May 30, 1935, discharge, 35,000 cfs, by slope-area measurement of peak flow.

Remarks.--Records fair. Diversions above station for irrigation of about 22,500 acres.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	3.5	9.3	3.6	4.0	2.6	8.1	1.4	0.4	9.0	51	17
2	.5	3.5	8.9	2.6	3.3	2.8	7.2	1.4	4.9	2.29	294	14
3	.5	4.0	9.3	2.5	3.0	2.3	6.8	1.5	7.2	1.10	382	33
4	.5	4.3	9.7	2.3	2.5	2.0	*6.5	*2.4	5.08	53	146	91
5	*.5	4.6	8.1	2.5	2.0	1.9	6.8	1.7	1.52	21	93	73
6	.5	4.9	4.9	3.6	1.9	2.1	1.1	1.5	9.0	61	75	49
7	.8	5.2	*7.6	3.9	2.2	2.4	1.2	1.7	8.0	1.05	49	*34
8	1.3	5.6	1.2	3.8	2.0	*2.1	1.0	1.9	*7.5	3.00	36	25
9	1.3	7.2	1.7	3.5	*2.0	2.6	1.2	2.2	6.9	2.35	48	15
10	1.3	5.2	2.3	4.5	2.0	3.8	1.2	2.2	6.2	1.03	*53	14
11	1.0	4.9	2.4	*3.9	1.9	3.6	8.1	1.7	5.5	1.22	589	16
12	.8	4.6	2.6	3.3	1.8	3.5	6.8	1.5	4.8	*2.00	3.09	19
13	.7	4.6	2.5	3.4	1.8	2.6	6.5	3.7	3.9	1.22	89	27
14	.9	4.6	2.3	4.0	1.4	2.2	6.2	4.6	2.56	1.18	195	29
15	1.8	4.0	2.3	3.5	1.2	2.0	6.2	3.3	2.35	1.26	91	33
16	1.2	3.3	2.2	3.5	1.5	1.5	7.2	2.6	1.82	1.13	87	30
17	4.0	3.3	2.3	3.5	1.6	1.5	5.6	2.4	1.43	1.10	75	35
18	2.9	3.3	2.8	3.4	1.9	2.7	4.6	2.2	1.10	1.05	73	46
19	*2.2	3.3	3.4	3.0	1.9	2.2	*3.7	1.7	9.3	87	61	42
20	9.3	3.3	3.4	2.8	1.9	2.0	3.0	1.0	1.15	87	49	*61
21	5.6	*3.3	2.8	2.8	*1.9	1.6	3.0	.8	*1.08	91	46	1.13
22	4.3	3.0	3.5	3.5	2.1	1.2	2.4	0	8.3	4.9	40	85
23	4.0	2.8	3.6	4.4	2.3	1.1	1.5	.4	7.5	4.4	40	83
24	4.0	3.5	3.0	*5.0	2.1	1.1	1.4	*1.4	7.1	3.9	*34	91
25	4.0	3.7	2.8	3.9	2.4	9.3	1.4	.9	7.3	3.0	2.8	1.10
26	4.0	3.3	2.5	3.6	2.4	8.5	1.0	.2	6.2	2.1	1.8	1.03
27	4.0	3.3	2.3	3.3	2.6	8.5	1.7	0	4.1	1.4	2.0	1.03
28	3.7	2.8	1.7	2.8	2.6	8.9	1.2	0	2.0	1.9	2.8	91
29	4.0	3.7	1.9	2.9	-	9.7	1.2	0	1.2	4.9	1.8	85
30	3.7	9.7	2.5	3.6	-----	8.5	1.2	0	1.0	3.3	1.3	75
31	3.7	-----	3.8	5.0	-----	8.1	-----	0	-----	3.7	1.0	-----
Total	123.4	126.3	675.8	107.9	60.2	595.5	166.3	46.3	2879.5	2842.0	3140	1642
Mean	3.98	4.21	21.8	34.8	21.5	19.2	5.54	1.49	96.0	91.7	101	54.7
Ac-ft	245	251	1,340	2,140	1,190	1,180	330	92	5,710	5,640	6,230	3,260

Calendar year 1960: Max 260 Min 0.5 Mean 20.7 Ac-ft 15,020

Water year 1960-61: Max 589 Min 0 Mean 38.1 Ac-ft 27,610

Peak discharge (base, 1,700 cfs).--June 4 (6 a.m.) 2,750 cfs (5.41 ft); Aug. 11 (10 p.m.) 6,200 cfs (6.40 ft).

\* Discharge measurement made on this day.

## ARKANSAS RIVER BASIN

7-1110. Huerfano River at Manzanares Crossing, near Redwing, Colo.

Location.--Lat 37°43'40", long 105°21'10", in sec. 5, T. 27 S., R. 71 W., on left bank at Manzanares Crossing, a quarter of a mile downstream from Manzanares Creek and  $\frac{3}{4}$  miles southwest of Redwing.

Drainage area.--73 sq mi.

Records available.--July 1923 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 8,150 ft (from topographic map). Prior to Sept. 8, 1934, at sites about 500 ft upstream at different datums. Sept. 8, 1934, to Mar. 15, 1937, at datum 1.36 ft higher, Mar. 16, 1937, to Sept. 30, 1945, at datum 0.86 ft higher, and Oct. 1, 1945, to Apr. 25, 1946, at datum 0.36 ft higher than present datum.

Average discharge.--38 years, 33.3 cfs (24,110 acre-ft per year).

Extremes.--Maximum discharge during year, 141 cfs July 5 (gage height, 1.69 ft); minimum not determined.

1923-61: Maximum discharge, 10,200 cfs Aug. 2, 1951 (gage height, 8.14 ft), from rating curve extended above 270 cfs on basis of slope-area measurement of peak flow; minimum daily determined, 4 cfs Jan. 22, 1937.

Remarks.--Records good below 100 cfs and fair above except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 1,800 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	9.0
.6	28
1.0	63
1.5	118

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	20					16	46	97	64	42	38
2	15	21					17	*48	96	65	42	36
3	16	20					28	49	94	58	66	45
4	16	20		(*)			35	58	88	55	73	48
5	16	20					28	59	90	62	70	48
6	17	22				12	22	58	87	*58	58	48
7	16	20					22	57	87	61	*52	49
8	17	18					19	53	91	58	48	55
9	17	19					20	52	*90	57	44	59
10	17	19					*19	52	92	54	42	66
11	17	18				13	18	55	91	51	42	62
12	17	17				13	21	67	87	49	51	58
13	19	17			(*)	16	22	77	86	48	53	53
14	*21	*14	(*)			18	19	73	84	47	60	*50
15	24	b13				*22	20	70	80	45	54	48
16	27	b14	8.5	10	11	19	22	66	74	43	53	48
17	26	b15				17	28	64	77	41	50	45
18	24	b13		(*)		16	41	64	73	41	51	44
19	24	b13				15	57	70	75	40	48	63
20	25	b13				16	64	80	76	40	44	63
21	26	b12				16	*57	80	73	41	42	58
22	24	b12				*17	56	87	72	38	41	52
23	24	b12				20	52	97	69	35	40	48
24	23	b12				22	48	97	69	*34	42	47
25	22	12				20	38	98	*65	37	47	45
26	22	13				17	39	*98	63	40	42	42
27	22	b12				17	40	98	62	40	42	39
28	22	b10				16	42	100	63	44	48	38
29	20	b9.0				b14	46	100	63	43	44	37
30	20	9.0				17	46	102	61	40	40	35
31	19	-----		(*)	-----	17	-----	96	-----	40	*40	-----
Total	631	459.0	263.5	310	308	478	1,002	2,271	2,375	1,469	1,511	1,467
Mean	20.4	15.3	8.5	10	11	15.4	33.4	73.3	79.2	47.4	48.7	48.9
Ac-ft	1,250	910	523	615	611	948	1,990	4,500	4,710	2,910	3,000	2,910

Calendar year 1960: Max 142 Min - Mean 36.0 Ac-ft 26,140  
 Water year 1960-61: Max 102 Min - Mean 34.4 Ac-ft 24,880

Peak discharge (base, 200 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 30 to Mar. 14 (stage-discharge relation affected by ice during most of period).

7-1140. Cucharas River at Boyd Ranch, near La Veta, Colo.

Location.--Lat 37°25', long 105°03', in sec.24, T.30 S., R.69 W., on left bank at Boyd Ranch, 6 miles south of La Veta.

Drainage area.--56 sq mi.

Records available.--October 1934 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,800 ft (from base map).

Average discharge.--27 years, 25.5 cfs (18,460 acre-ft per year).

Extremes.--Maximum discharge during year, 149 cfs May 25 (gage height, 2.37 ft); minimum not determined.

1934-61: Maximum discharge, 444 cfs May 23, 1955 (gage height, 4.05 ft); minimum daily, 2 cfs for several days November 1934 to January 1935, Sept. 29, 1950.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Diversions for irrigation of about 500 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 23 to May 8, May 21 to June 14)

1.2	10
1.4	20
1.7	44
2.1	89
2.6	152

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							*11	101	143	55	28	29
2							11	95	*140	52	33	26
3							16	*103	139	48	78	33
4				(*)			37	107	134	45	65	33
5							33	105	130	48	57	31
6						8						
7							25	94	123	51	51	30
8							21	85	118	*48	*45	26
9		(*)					21	76	118	48	40	26
10							23	72	117	45	36	24
11							22	80	118	40	35	24
12						8.5	22	95	114	39	36	23
13						9.0	25	110	108	40	33	22
14			(*)		(*)	10	27	120	105	39	34	*21
15						*11	*25	110	108	36	52	22
16	10	12	9	8	8	12	25	100	108	34	46	21
17						14	25	94	101	32	45	22
18						13	30	94	*100	31	43	22
19	(*)			(*)		13	45	*99	96	30	40	25
20						13	60	111	96	29	36	26
21						13	80	122	99	29	*32	24
22						14	*100	127	89	31	28	23
23						15	103	127	85	29	27	22
24						17	105	130	83	26	26	22
25						*18	92	135	81	*24	26	22
26						18	*87	*138	76	24	28	21
27						17	78	135	71	23	35	21
28						16	75	140	65	22	39	21
29						14	78	144	62	24	35	*20
30		(*)				10	88	139	57	23	33	20
31				(*)		15	99	140	57	21	32	20
						17		144		23	*30	
Total	310	360	279	248	224	367.5	1,489	3,472	3,041	1,089	1,204	722
Mean	10	12	9	8	8	11.9	49.6	112	101	35.1	38.8	24.1
Ac-ft	615	714	553	492	444	729	2,950	6,890	6,030	2,160	2,390	1,430

Calendar year 1960: Max 89 Min - Mean 21.4 Ac-ft 15,550  
 Water year 1960-61: Max 144 Min - Mean 35.1 Ac-ft 25,400

Peak discharge (base, 150 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1 to Mar. 23 (stage-discharge relation affected by ice during most of period), Apr. 6, 15-24, May 7-17.



## ARKANSAS RIVER BASIN

7-1160. Huerfano River below Huerfano Valley Dam, near Undercliffe, Colo.

Location.--Lat 38°00', long 104°28', in S $\frac{1}{2}$  sec. 32, T.23 S., R.63 W., at left end of diversion dam for Huerfano Valley ditch, 8 miles southwest of Undercliffe.

Drainage area.--1,673 sq mi.

Records available.--October 1939 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 4,886.29 ft above mean sea level, datum of 1929. Prior to July 26, 1950, at site 0.3 mile downstream at datum 14.27 ft lower and July 26, 1950, to Dec. 15, 1954, at site 0.3 mile downstream at datum 16.27 ft lower.

Average discharge.--22 years, 40.6 cfs (29,390 acre-ft per year).

Extremes.--Maximum discharge during year, 2,080 cfs Aug. 12 (gage height, 3.95 ft); no flow at times.

1939-61: Maximum discharge, 16,800 cfs July 5, 1958 (gage height, 14.5 ft), from rating curve extended above 380 cfs on basis of computation of flow over dam at gage heights 11.04 and 14.5 ft; no flow at times in nearly every year.

Maximum stage and discharge known since at least 1900, that of July 5, 1958, from information by local residents.

Remarks.--Records poor. Diversions above station for irrigation of about 43,000 acres.

Discharge, in cubic feet per second, water year October 1960 to September 1961																																										
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.																														
1	1.4	1	4.1	19	9.9	11	12	224	39	38	107	15																														
2	.2		10										36																													
3	.2		5																																							
4	.1		4																																							
5	*.1		3																																							
6	.1	6	2.5	11	11	11	11	11	11	11	11																															
7	.1		*2.6																																							
8	0		3.3																																							
9	0		7.8																																							
10	0		20																																							
11	0	10	18	19	93	11	11	11	11	11	11																															
12	0	5	11									62																														
13	0	3	5.6									14																														
14	.1	4	6.6									8																														
15	5.9	2	5.7									4.0																														
16	5.4	2	18	15	15	15	15	15	15	15	15	15																														
17	8.3												15	15	15	15	15	15	15	15	15	15																				
18	23																						15	15	15	15	15	15	15	15	15	15										
19	*15																																15	15	15	15	15	15	15	15	15	15
20	12																																									
21	10	15	15	15	15	15	15	15	15	15	15																															
22	5											15	15	15	15	15	15	15	15	15	15																					
23	2																					15	15	15	15	15	15	15	15	15	15											
24	2																															15	15	15	15	15	15	15	15	15	15	
25	3																																									15
26	4	15	15	15	15	15	15	15	15	15	15																															
27	3											15	15	15	15	15	15	15	15	15	15																					
28	2																					15	15	15	15	15	15	15	15	15	15											
29	2																															15	15	15	15	15	15	15	15	15	15	
30	1																																									15
31	1	15	15	15	15	15	15	15	15	15	15																															
Total	106.9											69	397.2	495.2	430.7	341	3,612	2,456	1,170	1,178	3,317																					
Mean	3.45											2.3	12.8	16.0	15.4	11	120	79	39	38	107	14.5																				
Ac-ft	212											137	788	982	854	676	7,160	4,870	2,320	2,340	6,580	861																				

Calendar year 1960: Max - Min 0 Mean 11.1 Ac-ft 8,060  
 Water year 1960-61: Max - Min 0 Mean 38.4 Ac-ft 27,780

Peak discharge (base, 3,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Discharge estimated except for Oct. 1-14, Dec. 7-15, Feb. 15-18.

7-1170. Arkansas River near Nepesta, Colo.

Location.--Lat 38°11', long 104°10', in NW $\frac{1}{4}$  sec. 31, T.21 S., R.60 W., on right bank 100 ft downstream from diversion dam of Oxford Farmers Co. canal,  $1\frac{1}{4}$  miles west of Nepesta, and 6 miles downstream from Huerfano River.

Drainage area.--9,345 sq mi, of which 54 sq mi is probably noncontributing.

Records available.--April to October 1903, April to November 1912, October 1913 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Records originally published for October 1933 to June 1936 did not include diversion to Oxford Farmers Co. canal, but monthly figures only for this period have been adjusted for diversion and published in WSP 1311.

Records for river below Oxford Farmers Co. canal (diversion to canal not included), published as "at Nepesta," September 1897 to October 1902 (irrigation seasons only), April to October 1904, June 1906 to September 1908 (irrigation seasons only), September 1909 to December 1910, February to September 1911 (gauge heights and discharge measurements only), October 1911 to November 1912, March to August 1913 (discharge measurements only), October 1913 to September 1936. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorders on river and on Oxford Farmers Co. canal. Datum of river gage is 4,378.68 ft above mean sea level, datum of 1929. Prior to June 5, 1921, staff gages or water-stage recorders at various sites within 5 miles upstream and 2 miles downstream at different datums. June 5, 1921, to Oct. 1, 1952, water-stage recorders at sites on river or river and canal within 300 ft at approximately present datum.

Average discharge.--48 years (1913-61), 698 cfs (505,300 acre-ft per year).

Extremes.--Maximum discharge during year, 15,700 cfs Aug. 12; minimum daily, 74 cfs Jan. 30.

1897-1904, 1906-12, 1913-61: Maximum discharge, 180,000 cfs June 4, 1921 (gage height not determined), by slope-area measurement of peak flow at point 9 miles upstream; no flow at times in 1902, 1910, 1931, 1934.

Remarks.--Records poor. Discharge computed by combining discharge of river below canal with that of Oxford Farmers Co. canal. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation of about 230,000 acres, and return flow from irrigated areas.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	206	233	260	99	369	340	320	2540	1110	455	553
2	149	221	280	260	140	385	315	*340	*4000	860	*1530	506
3	139	222	307	250	140	385	309	343	3050	974	2060	574
4	*153	256	301	250	140	449	339	332	3470	593	1190	1070
5	126	266	306	250	140	427	416	264	*1140	463	1400	1320
6	109	283	369	251	140	410	557	283	741	488	986	1480
7	*116	328	362	309	140	395	538	269	1510	1200	917	*1590
8	124	338	353	345	*142	367	550	262	954	1610	801	1410
9	108	396	366	*362	174	339	487	308	1390	1100	938	1300
10	113	279	463	386	306	381	434	*246	1480	521	743	1370
11	234	323	324	404	460	383	466	198	1870	335	1260	1550
12	262	324	223	422	407	295	479	195	1810	1200	6110	1790
13	243	241	211	398	395	295	402	149	1500	431	1080	1530
14	191	189	274	397	484	325	317	290	1700	538	*2320	1300
15	297	239	219	389	451	310	312	412	*1660	736	1010	1180
16	314	284	226	332	404	346	317	492	2070	618	667	1220
17	426	295	183	410	464	418	276	*437	2010	539	433	1180
18	711	*253	183	452	522	522	287	436	1300	414	1510	*1070
19	919	201	299	415	488	512	287	472	1100	357	1330	1010
20	*506	253	350	362	394	457	262	504	2390	342	1030	1130
21	404	290	246	404	320	423	317	620	1410	516	1010	1250
22	340	309	302	403	307	391	551	729	1100	757	936	1180
23	280	312	317	*436	389	310	486	809	1380	489	854	1070
24	242	274	323	466	388	313	485	1050	1620	*442	734	1350
25	281	255	261	448	334	309	471	1000	1630	320	713	1620
26	*249	267	182	321	328	284	411	*1880	1520	260	689	1540
27	264	230	162	306	371	315	393	2450	1370	277	589	*1080
28	235	260	152	164	391	360	318	2580	1310	948	1060	1060
29	218	265	161	156	-	392	286	2650	1010	707	824	1110
30	191	223	*260	74	-----	403	284	2580	1200	567	599	996
31	194	-----	270	93	-----	325	-----	2510	-----	403	524	-----
Total	8,286	8,082	8,468	10,175	8,858	11,595	11,692	25,410	51,235	20,115	36,302	36,389
Mean	267	269	273	328	316	374	390	820	1,708	649	1,171	1,213
Ac-ft	16,440	16,030	16,800	20,180	17,570	23,000	23,190	50,400	101,600	39,900	72,000	72,180

Calendar year 1960: Max 2,770 Min 48 Mean 488 Ac-ft 353,900  
 Water year 1960-61: Max 6,110 Min 74 Mean 648 Ac-ft 469,300

\* Discharge measurement made on this day.

Note.--Discharge computed from twice-daily chain-gage readings on river Dec. 16 to Jan. 15, Feb. 2-7. Stage-discharge relation affected by ice on river Dec. 30 to Jan. 5, Feb. 2-7, and on canal Jan. 28, 29.

## ARKANSAS RIVER BASIN

7-1195. Apishapa River near Fowler, Colo.

Location.--Lat 38°05'28", long 103°58'52", in SE $\frac{1}{4}$ NW $\frac{1}{4}$  sec.35, T.22 S., R.59 W., near right bank on downstream side of county highway bridge, 4 miles southeast of Fowler and 5.4 miles upstream from mouth.

Drainage area.--1,125 sq mi.

Records available.--April 1922 to September 1925, May 1939 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 4,317.05 ft above mean sea level, datum of 1929. Prior to Aug. 29, 1923, at site 3 miles downstream at different datum. Aug. 29, 1923, to Sept. 30, 1925, at present site at different datum.

Average discharge.--25 years, 36.8 cfs (26,640 acre-ft per year).

Extremes.--Maximum discharge during year, 3,620 cfs Aug. 3 (gage height, 7.00 ft); minimum daily, 1.0 cfs May 18.  
1922-25, 1939-61: Maximum discharge, 85,000 cfs Aug. 22, 1923, by slope-area measurement 2 miles upstream from present station, caused by failure of Apishapa Dam 31 miles upstream; no flow Feb. 5, 1951.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Waste water from Oxford Farmers Co. and Rocky Ford Highline canals enter river above station. Diversions above station for irrigation of about 4,700 acres.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	27	4.4	2.5	5.0	13	8.1	2.1	2.1	10	18	5.0
2	2.0	25	4.3	2.5	4.9	9.7	7.2	1.8	5.6	12	22	3.8
3	*1.8	26	5.0	2.5	4.8	5.6	10	2.0	58	11	571	4.7
4	1.6	26	5.4	2.6	4.6	5.3	15	2.4	275	10	682	2.9
5	1.8	25	*5.0	2.6	4.5	5.0	*15	2.0	*58	10	82	*3.2
6	2.1	23	5.8	2.6	4.5	*2.9	17	1.6	168	10	55	10
7	2.0	24	5.7	2.6	4.4	6.8	17	1.6	243	15	*53	14
8	2.1	25	5.3	2.6	4.3	6.4	23	1.6	27	*19	71	12
9	2.4	26	3.4	*2.6	*4.1	8.1	9.7	1.8	24	8.9	48	11
10	2.3	28	23	2.7	5.0	6.8	8.9	2.0	22	12	45	5.6
11	1.6	33	24	2.8	14	6.0	6.8	*2.0	22	9.7	62	8.9
12	1.3	38	22	2.9	13	6.0	6.4	1.8	20	241	748	14
13	1.3	28	20	3.0	6.0	2.1	5.6	2.0	20	78	96	14
14	1.5	15	18	3.3	4.1	1.8	6.8	1.5	79	26	26	12
15	4.7	18	17	4.5	4.4	1.6	4.7	1.3	85	24	15	15
16	6.4	18	15	4.3	7.6	1.5	3.5	1.2	33	23	10	15
17	*8.5	19	14	4.1	7.6	4.1	*2.3	1.2	30	22	10	9.3
18	35	20	16	3.9	5.0	12	1.8	1.0	26	21	11	*9.3
19	52	19	19	3.8	5.3	9.3	1.5	1.2	*22	20	11	12
20	24	20	*17	3.7	*4.4	8.9	1.5	1.6	184	20	12	15
21	28	*20	13	4.2	5.6	9.3	1.3	3.5	20	22	12	12
22	28	20	12	4.8	5.6	7.6	1.3	*1.8	15	55	12	12
23	26	22	13	*5.1	8.5	8.5	1.3	2.1	10	52	13	17
24	23	26	13	5.0	7.2	6.4	1.3	2.0	15	31	*13	16
25	24	25	14	4.7	6.4	4.4	1.8	1.8	27	28	13	23
26	22	25	10	4.4	7.2	6.4	1.8	1.8	20	24	12	22
27	23	23	7.5	4.2	11	5.3	1.2	1.8	15	23	7.6	22
28	27	21	4.5	4.0	12	8.5	1.5	1.5	13	26	5.0	22
29	29	28	2.5	4.4	-	28	1.8	1.6	12	29	15	22
30	24	4.6	2.5	4.7	-----	23	1.5	1.8	10	30	13	30
31	18	-----	2.5	5.0	-----	11	-----	2.0	-----	22	8.1	-----
Total	428.8	739	742.5	112.6	181.0	241.3	186.6	55.4	1560.7	944.6	2772.7	394.7
Mean	13.8	24.6	24.0	3.63	6.46	7.78	6.22	1.79	52.0	30.5	89.4	13.2
Ac-ft	851	1,470	1,470	223	359	479	370	110	3,100	1,870	5,500	783

Calendar year 1960: Max 2,130 Min 0.9 Mean 19.8 Ac-ft 14,370

Water year 1960-61: Max 748 Min 1.0 Mean 22.9 Ac-ft 16,580

Peak discharge (base, 3,000 cfs).--Aug. 3 (10 p.m.) 3,620 cfs (7.00 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 13 to Feb. 8 (stage-discharge relation affected by ice during most of period), June 8-18, June 21 to July 7, July 13-20, Aug. 5, 6, 14-23.

7-1230. Arkansas River at La Junta, Colo.

Location.--Lat 37°59', long 103°31', in sec.2, T.24 S., R.55 W., on downstream side near middle of East Bridge in La Junta, just upstream from King Arroyo.

Drainage area.--12,210 sq mi, of which 115 sq mi is probably noncontributing.

Records available.--May to August 1889, September 1893 to December 1895 (gage heights, discharge measurements, and flood data only), April to October 1903, June to November 1908 (gage heights and discharge measurements only), April 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Published as "near La Junta" in 1903.

Gage.--Water-stage recorder, and chain gage read twice daily. Datum of gage is 4,039.60 ft above mean sea level, datum of 1929. Prior to Apr. 11, 1912, staff gages at several sites within 2 miles at various datums. Apr. 11, 1912, to June 12, 1940, water-stage recorder and staff or chain gages at several sites within 1 mile at various datums.

Average discharge.--49 years (1912-61), 262 cfs (189,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,800 cfs Aug. 12 (gage height, 7.23 ft); minimum daily, 4.0 cfs Mar. 1. 1889, 1893-95, 1903, 1908, 1912-61: Maximum discharge, 200,000 cfs June 4, 1921 (gage height, 18.4 ft, at present site, datum then in use), from rating curve extended above 15,000 cfs on basis of slope-area measurement of peak flow; no flow Jan. 20-23, Mar. 20-22, 1915.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Discharge measurements generally made three or more times a month. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation of about 400,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 18 to Nov. 9, Nov. 14-18, Jan. 10 to Feb. 3, Mar. 9, May 31, June 1, 14-21, July 7, 8, 13-15, 19, Sept. 27-29)

Oct. 1 to June 1

June 2 to Sept. 30

2.9	4.0	3.6	96	3.4	25	4.6	460
3.0	10	4.0	260	3.7	63	5.0	820
3.2	30	4.4	490	4.0	142	5.4	1,480
3.5	74	4.7	760	4.3	275	5.7	2,240

Discharge in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	71	31	a22	19	4.0	26	49	690	488	260	292
2	14	38	30	a22	14	14	23	56	868	360	178	255
3	14	30	29	a26	10	7.6	27	33	614	557	774	308
4	14	29	42	a26	19	5.8	22	57	804	670	536	397
5	13	44	31	a18	12	15	31	74	142	509	516	509
6	12	49	20	a14	8.8	15	38	56	254	372	566	523
7	11	43	12	a16	5.8	9.4	36	44	150	487	474	548
8	14	57	41	a10	9.5	8.2	38	42	123	807	460	620
9	19	54	14	a12	5.2	8.8	49	31	97	342	439	495
10	29	59	10	a14	5.8	7.6	39	29	123	575	530	516
11	36	39	12	12	51	7.0	29	29	126	384	548	516
12	36	30	9.4	10	46	36	28	15	126	425	2,230	502
13	29	38	8.2	9.4	16	24	24	15	132	212	488	523
14	26	36	8.2	8.8	11	24	39	30	217	113	a165	495
15	26	44	8.2	9.4	18	14	33	16	136	116	a165	502
16	20	53	8.8	10	10	14	33	15	136	136	157	a523
17	21	40	a20	10	7.0	20	30	36	153	207	217	a509
18	124	40	a50	10	20	34	24	42	146	220	509	a453
19	318	36	a30	11	13	33	15	59	94	107	602	a404
20	76	36	a35	28	8.8	29	12	78	80	87	523	446
21	60	34	a25	22	17	21	13	103	169	84	523	509
22	64	27	a12	14	12	20	22	81	161	97	425	548
23	118	31	a12	12	10	21	54	150	142	255	425	548
24	166	42	a18	30	8.2	20	81	275	220	220	372	509
25	142	34	a10	24	19	23	71	522	216	87	330	467
26	134	28	a10	23	11	24	64	522	207	49	265	446
27	123	26	a10	22	10	21	67	730	284	32	314	425
28	116	38	a9.0	16	7.6	23	66	455	530	29	378	286
29	120	13	a14	11	-	29	47	597	548	208	453	286
30	138	11	a16	33	-----	43	46	651	575	342	411	314
31	85	-----	a18	82	-----	34	-----	633	-----	255	297	-----
Total	2133	1150	603.8	587.6	404.7	609.4	1127	5525	8263	8832	14530	13674
Mean	68.8	38.3	19.5	19.0	14.5	19.7	37.6	178	285	285	469	456
Ac-ft	4,230	2,280	1,200	1,170	803	1,210	2,240	10,960	16,390	17,520	28,820	27,120

Calendar year 1960: Max 2,150 Min 5.8 Mean 111 Ac-ft 80,360  
Water year 1960-61: Max 2,230 Min 4.0 Mean 157 Ac-ft 113,900

a No gage-height record.



## ARKANSAS RIVER BASIN

7-1240. Arkansas River at Las Animas, Colo.

Location.--Lat 38°05'08", long 103°12'50", in SW $\frac{1}{4}$  sec.35, T.22 S., R.52 W., on left bank 0.4 mile downstream from bridge on U. S. Highway 50, 1.5 miles north of courthouse in Las Animas, and  $\frac{3}{2}$  miles upstream from Purgatoire River.

Drainage area.--14,417 sq mi, of which 441 sq mi is probably noncontributing.

Records available.--May to November 1898 (gage heights only), August to November 1909 (gage heights and discharge measurements only), May 1939 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 3,874.97 ft above mean sea level, datum of 1929. May 13 to Nov. 12, 1898, and Aug. 1 to Nov. 10, 1909, staff gage within half a mile of present site at different datum.

Average discharge.--22 years, 242 cfs (175,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,340 cfs Aug. 13 (gage height, 10.57 ft); minimum daily, 4.0 cfs Oct. 6-8.  
1939-61: Maximum discharge, 44,000 cfs May 20, 1955 (gage height, 15.03 ft), from rating curve extended above 24,000 cfs on basis of slope-area measurement of peak flow; minimum daily, 1.6 cfs Sept. 17, 1956.

Remarks.--Records fair. Discharge measurements generally made at least once a week. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation of about 412,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 6-8, Aug. 1, 2, Sept. 28-30)

Oct. 1 to Nov. 5,  
May 24 to June 6,  
June 28 to Aug. 25

Nov. 6 to May 23,  
June 7-27,  
Aug. 26 to Sept. 30

6.1	4.0	7.2	210	6.3	4.0	7.2	172
6.2	7.5	7.6	385	6.4	10	7.6	325
6.3	13	8.0	700	6.5	20	8.0	565
6.4	24	8.5	1,210	6.6	34	8.2	750
6.6	56	9.0	1,860	6.9	94		
6.9	120	9.5	2,630				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	6.4	31	38	50	45	23	9.4	4.92	3.92	1.06	1.85
2	5.8	4.2	3.4	4.5	28	41	24	13	7.20	2.94	1.02	1.52
3	5.8	3.0	3.6	4.8	4.3	41	23	19	1.080	3.85	2.68	1.52
4	5.8	2.3	3.9	5.2	3.8	43	20	33	9.20	4.50	5.37	2.44
5	4.7	2.0	4.3	5.4	3.8	41	20	33	2.54	4.50	3.04	3.02
6	4.0	5.0	3.9	5.6	3.8	41	20	2.0	1.72	2.99	3.85	3.65
7	4.0	5.2	1.9	6.0	3.4	3.8	21	12	2.26	3.35	4.04	4.02
8	4.0	3.9	2.0	5.6	3.1	3.8	23	12	1.13	2.98	3.45	4.24
9	4.4	2.7	2.1	5.2	3.0	3.8	2.6	1.0	7.6	1.92	3.35	3.80
10	5.4	2.4	2.4	5.6	3.1	3.0	2.4	1.0	4.8	3.60	4.11	3.60
11	6.1	2.4	3.0	5.8	3.3	3.1	2.3	8.8	4.1	3.40	5.06	3.97
12	7.2	2.1	3.8	5.2	3.6	2.4	2.6	7.0	4.1	2.54	6.07	4.14
13	7.2	1.8	4.1	4.5	3.9	3.3	2.1	8.8	4.5	2.10	2.000	3.97
14	7.2	1.9	3.7	4.8	4.1	3.4	1.6	1.4	4.7	6.0	1.54	5.74
15	11	1.8	4.6	5.4	4.5	3.0	1.6	9.4	5.8	3.7	1.08	5.12
16	11	1.7	4.1	5.6	4.7	2.4	1.7	7.6	2.4	2.2	9.9	4.30
17	11	1.6	3.5	3.8	3.6	2.4	1.9	7.6	2.6	3.7	7.6	4.19
18	2.3	1.5	5.4	3.8	3.4	3.0	1.5	10	2.6	7.8	1.89	4.48
19	1.33	1.5	9.0	3.8	3.0	3.0	9.4	1.0	2.4	1.02	5.06	4.14
20	1.96	1.3	1.23	3.6	2.8	2.6	8.8	1.5	1.9	6.0	3.70	4.02
21	8.9	1.4	9.5	3.8	2.7	1.6	8.2	2.0	1.9	2.5	3.85	4.19
22	4.9	1.5	8.2	3.8	2.7	1.9	8.2	2.8	2.1	1.8	3.60	4.90
23	5.1	1.2	8.8	3.8	2.8	1.9	10	2.0	1.1	1.8	2.99	4.48
24	8.2	1.3	9.2	3.9	3.1	1.9	9.4	6.6	1.0	1.42	2.90	4.30
25	9.7	1.6	9.0	3.9	3.8	1.8	7.0	1.82	3.8	8.6	2.63	3.80
26	9.7	1.6	7.9	2.1	3.6	2.1	7.0	3.45	2.8	3.5	2.26	4.42
27	9.7	1.9	6.4	3.6	4.5	2.1	7.6	4.57	2.3	2.0	1.85	4.19
28	9.9	2.1	5.4	9.9	4.3	2.6	7.0	3.75	2.10	1.5	2.02	3.70
29	9.7	2.7	3.6	1.50	-	2.1	8.8	2.45	3.92	1.6	2.80	2.89
30	1.15	2.7	4.3	2.22	-----	2.3	10	4.64	4.30	9.1	3.86	2.48
31	1.04	-----	3.9	1.31	-----	2.3	-----	3.80	-----	1.42	2.48	-----
Total	1.440.0	727	1.603	1.831	1.005	908	478.4	2.851.6	5.634	5.963	1.093.6	1.130.8
Mean	46.5	24.2	51.7	59.1	35.9	29.3	15.9	92.0	188	192	353	377
Ac-ft	2,860	1,440	3,180	3,630	1,990	1,800	949	5,660	11,170	11,830	21,690	22,430

Calendar year 1960: Max 1,550 Min 4.0 Mean 88.2 Ac-ft 64,040  
Water year 1960-61: Max 2,000 Min 4.0 Mean 122 Ac-ft 88,630

Note.--Stage-discharge relation affected by ice Dec. 11-24, 30, Jan. 3-15.

7-1245. Purgatoire River at Trinidad, Colo.

Note.--Records for the 1961 water year not available in time for inclusion in this report. They will be published in a subsequent annual report.

## ARKANSAS RIVER BASIN

7-1250. Purgatoire River near Hoehne, Colo.

Location.--Lat 37°14'50", long 104°23'50", in sec.13, T.32 S., R.63 W., on left bank 5 ft downstream from bridge on county road, 40 ft upstream from diversion dam for Hoehne ditch, 2½ miles southwest of Hoehne, and 8 miles northeast of city hall in Trinidad.

Drainage area.--857 sq mi.

Records available.--September 1954 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 5,740.99 ft above mean sea level, datum of 1929.

Average discharge.--7 years, 27.9 cfs (20,200 acre-ft per year).

Extremes.--Maximum discharge during year, 5,060 cfs July 12 (gage height, 6.91 ft), from rating curve extended above 180 cfs as explained below; no flow for many days.

1954-61: Maximum discharge, 35,000 cfs May 19, 1955 (gage height, 13.97 ft), from rating curve extended above 180 cfs by logarithmic plotting on basis of flow-over-dam computations at gage heights, 3.2, 4.5, and 7.34 ft; no flow for many days in each year.

Greatest flood known since at least 1859 occurred Sept. 30, 1904.

Remarks.--Records poor. Flow partly regulated by off-stream reservoirs and a flood control dam on unnamed creek in Pinon Canyon. Diversion above station for irrigation of about 10,500 acres. Diversion by Hoehne ditch 40 ft below gage is not included in these records.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	1.2	4.5	9.5	2.5	0	1.0	1.7	0.5	5.2	0.9
2	0	0	0	5	2.5	3	0	1.0	1.7	.4	131	.5
3	0	0	0	7	7.5	3.5	*.4	.4	5.0	.6	73	18
4	0	0	0	9	7	2.5	5.2	.9	3.5	.8	59	13
5	0	0	0	11	1	5.5	11	*1.0	1.1	.9	16	7.1
6	*0	0	0	13	1	4	14	.5	1.4	23	9.6	1.2
7	0	0	b.7	17	1	3.5	45	.2	4.8	3.5	9.3	.2
8	0	0	*b3.0	16	2.5	2.5	78	1.6	5.2	2.7	3.6	*.1
9	0	0	b1.5	14	7	*2.5	26	1.0	*1.8	4.6	.6	.4
10	0	1.0	b.7	12	*11	1.5	35	1.0	2.1	.9	.9	.4
11	0	.4	b1.0	13	35	1.5	148	1.0	1.1	1.5	*.6	2.3
12	0	.2	b3.5	*11	33	1.5	78	.8	.5	*499	20	.5
13	0	0	b2.5	11	28	3.0	73	2.0	1.7	*213	29	1.1
14	0	0	b.8	10	30	.8	87	1.2	5.5	226	11	1.2
15	.4	0	b.2	7.5	11	.3	78	2.2	83	13	7.0	.4
16	5.8	0	0	6.5	3	.3	177	1.3	35	.3	28	.1
17	171	0	11	8	0	.8	183	1.3	16	.2	8.5	.1
18	278	0	8.0	8	0	1.0	148	7.9	.7	.1	19	.3
19	126	.2	5.5	5	0	1.5	126	1.7	3.7	0	8.0	.3
20	*54	0	3.5	3.5	0	1.0	*68	2.2	8.5	0	13	.1
21	12	.6	.9	4.5	2	.4	2.1	1.0	.5	203	*3.2	*.1
22	4.5	0	.2	4.5	*1.5	.7	1.8	2.1	*.4	24	.3	.4
23	3.0	0	.8	5	0	.8	.8	2.7	2.2	2.0	.9	.6
24	3.5	0	21	4	.5	.9	.7	4.7	1.9	1.1	.7	.5
25	4.5	0	10	*3.5	.5	1.0	.9	*5.1	.7	.7	.6	1.1
26	1.0	0	4.5	3	0	.8	.5	2.7	1.0	.5	12	2.6
27	.2	0	4.5	3	3	.9	1.0	1.1	.2	2.2	45	9.5
28	0	0	5.0	3	3	.8	.7	2.4	2.5	38	28	15
29	0	0	6.0	4	-	13	.9	1.9	1.0	18	.4	15
30	0	0	11	6.5	-----	1.0	.9	1.8	.3	.6	21	14
31	0	-----	8.5	8.5	-----	.4	-----	5.5	-----	.6	2.2	-----
Total	663.9	2.4	115.5	241.5	200.5	63.4	1,390.9	61.2	194.7	1,281.7	566.6	1,070
Mean	21.4	0.08	3.73	7.79	7.16	2.05	46.4	1.97	6.49	41.3	18.3	3.57
Ac-ft	1,320	4.8	229	479	398	126	2,760	121	386	2,540	1,120	212

Calendar year 1960: Max 278

Min 0

Mean 4.01

Ac-ft 2,910

Water year 1960-61: Max 499

Min 0

Mean 13.4

Ac-ft 9,700

Peak discharge (base, 2,000 cfs).--July 12 (10 p.m.) 5,060 cfs (6.91 ft); July 21 (4:15 p.m.) 2,260 cfs (5.37 ft).

\* Discharge measurement or observation of no flow made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 10-13, 19-23, Dec. 1-3, Dec. 17 to Mar. 9 (stage-discharge relation affected by ice during parts of periods), Apr. 21 to May 5, July 7 to Aug. 11, Aug. 14-21, Aug. 27 to Sept. 2, Sept. 5-8.

7-1251. Frijole Creek near Alfalfa, Colo.

Location.--Lat 37°12'00", long 104°11'40", in NW<sup>1</sup>/<sub>4</sub> sec.2, T.33 S., R.61 W., on right bank at downstream side of bridge on U. S. Highway 160, 1 mile upstream from mouth, 4 miles west of Alfalfa, and 16 miles east of city limits of Trinidad.

Drainage area.--80 sq mi.

Records available.--March 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,400 ft (from topographic map).

Extremes.--Maximum discharge during year, 760 cfs July 12 (gage height, 6.44 ft), from rating curve extended above 180 cfs as explained below; no flow for many days.

1957-61: Maximum discharge, 2,310 cfs Aug. 21, 1958 (gage height, 8.81 ft), from rating curve extended above 180 cfs on basis of slope-area measurement of peak flow; no flow for many days each year.

Flood of June 22, 1954, reached a stage of 17.23 ft, from floodmarks (discharge, 13,500 cfs, from rating curve extended above 8,800 cfs on basis of contracted-opening measurements of peak flow).

Remarks.--Records poor. Minor diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0	.1	.1	1.7	1.2	0	0.9	0.4	1.4
2	0	0	0	0	.1	.1	1.7	1.2	0	.8	.9	1.4
3	0	0	.1	0	.2	.2	*1.6	1.2	3.5	.7	1.0	1.5
4	0	0	.1	0	.2	.2	1.5	1.7	7.8	.6	1.2	1.7
5	0	0	.2	0	.2	.2	1.6	*2.1	5.3	.5	1.0	1.4
6	*0	0	.3	0	.2	.2	1.6	1.3	3.6	.4	7.2	1.1
7	0	0	.5	0	.2	.2	1.6	.7	3.4	.4	5.3	.7
8	0	.1	*.3	0	.2	.2	1.7	.4	2.3	.4	4.2	*.5
9	0	.2	.3	0	.2	*.2	1.8	.3	*1.3	.3	3.1	.4
10	0	.2	.3	0	*.2	.2	1.7	.2	1.0	.2	2.8	.2
11	0	.2	.2	0	.2	.1	1.1	.1	1.3	.2	*2.7	.2
12	0	.1	.2	**0	3	.1	9.2	0	1.6	7.3	2.1	.1
13	0	0	.2	0	b6	.1	8.6	0	1.9	*1.4	1.8	.1
14	0	0	.2	0	b4	.1	8.6	0	2.8	4.5	1.7	.1
15	0	0	.2	0	b3	.1	9.6	0	4.2	2.5	1.5	.1
16	.1	0	.2	0	2	.2	1.1	0	4.7	1.8	3.8	.1
17	1.39	0	.1	0	1	.2	1.1	0	4.7	1.5	1.3	0
18	.91	0	0	0	.6	.2	1.2	0	4.5	1.3	1.1	0
19	1.1	0	0	0	.4	.2	1.4	0	4.3	1.2	8.2	0
20	*5.5	0	0	0	.2	.2	*1.4	0	4.7	.9	5.5	0
21	4.3	0	0	0	.1	.3	1.4	0	4.5	4.5	*3.8	*0
22	3.4	0	0	0	**1	.3	1.2	0	*4.0	3.2	3.1	0
23	2.7	0	0	.1	.1	.3	9.6	0	3.8	4.0	2.7	0
24	1.9	0	0	.1	.1	1	7.5	0	3.4	2.4	2.4	0
25	1.3	.1	0	**1	.1	5	5.8	*0	2.9	2.2	2.3	0
26	.7	.2	0	.1	.1	3	4.3	0	2.4	1.8	2.3	0
27	.4	.1	0	.1	.1	2	3.4	0	2.1	1.5	2.2	0
28	.1	.1	0	.1	.1	1	2.5	0	1.7	1.2	1.9	0
29	0	0	0	.1	-	1	1.9	0	1.3	1.1	1.8	0
30	0	0	0	.1	-----	1.3	1.3	0	1.2	.7	1.7	0
31	0	-----	0	.1	-----	1.5	-----	0	-----	.6	1.6	-----
Total	261.4	1.3	3.4	0.9	23.0	20.0	203.1	10.4	121.7	139.3	133.0	11.0
Mean	8.43	0.04	0.11	0.03	0.82	0.65	6.77	0.34	4.06	4.49	4.45	0.37
Ac-ft	518	2.6	6.7	1.8	46	40	403	21	241	276	274	22

Calendar year 1960: Max 139 Min 0 Mean 2.28 Ac-ft 1,660  
 Water year 1960-61: Max 139 Min 0 Mean 2.56 Ac-ft 1,850

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-17	1:30p.m.	5.81	474	7-12	8:30p.m.	6.44	760
6-3	12:30p.m.	5.64	409				

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 8 to Feb. 12, Feb. 16 to May 4 (stage-discharge relation affected by ice during parts of periods).



## ARKANSAS RIVER BASIN

7-1255. San Francisco Creek near Alfalfa, Colo.

Location.--Lat 37°11'10", long 104°07'50", in sec.8, T.33 S., R.60 W., on downstream side of right abutment of bridge on U. S. Highway 160, half a mile upstream from mouth, 1½ miles south of Alfalfa, and 20 miles east of Trinidad.

Drainage area.--160 sq mi.

Records available.--October 1954 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,320 ft (from topographic map).

Average discharge.--7 years, 10.4 cfs (7,530 acre-ft per year).

Extremes.--Maximum discharge during year, 1,430 cfs Aug. 3 (gage height, 4.58 ft), from rating curve extended above 250 cfs as explained below; no flow for many days.

1954-61: Maximum discharge, 15,500 cfs May 19, 1955 (gage height, 13.00 ft), from rating curve extended above 250 cfs on basis of slope-area measurement of peak flow; no flow for many days in each year.

Flood of July 22, 1954, reached a stage of 14.40 ft, from floodmarks (discharge, 26,300 cfs, by contracted-opening measurement of peak flow).

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 500 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-17, Feb. 22 to Mar. 24,  
May 14-31, Aug. 12 to Sept. 30)

0.3	0	0.7	5.0	1.3	64
.4	.4	.8	9.8	1.6	118
.5	1.1	.9	16	2.0	210
.6	2.5	1.0	25		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.0	0.9	1.6	2.2	1.0	1.6	3.8	0.4	0.9	1.3	0.1
2	0	1.7	1.0	1.8	2.3	1.0	1.6	3.6	.4	.8	1.2	0
3	0	1.8	1.1	1.9	2.4	3.4	*1.6	3.4	6.2	.8	1.10	3.4
4	0	1.8	1.3	2.0	2.4	4.2	21	108	4.7	.8	8.6	.8
5	0	2.0	1.2	2.4	2.5	3.6	14	*29	3.6	.8	3.2	.4
6	*0	1.8	1.1	2.8	2.5	3.0	6.2	15	3.2	32	2.5	2
7	0	1.7	.9	3.4	2.6	2.0	7.1	10	3.6	13	2.3	.1
8	0	.9	*.7	3.5	2.6	1.2	7.1	12	2.5	14	2.0	*0
9	0	.9	.7	3.8	2.6	*.9	5.0	13	*1.7	11	1.6	0
10	0	1.8	.7	4.7	*2.7	.9	55	6.2	1.8	8.1	2.8	0
11	0	1.7	.8	5.6	3.0	.8	39	4.2	1.8	14	*.4	.4
12	0	1.7	.8	*6.6	10	.8	13	3.2	1.6	134	.5	.4
13	0	1.7	.8	7.4	3.0	.8	8.1	2.8	1.3	*12	10	.2
14	.3	1.6	.8	8.8	2.0	.8	4.7	4.2	1.7	35	1.3	.1
15	15	1.4	.8	9.0	1.5	.8	2.8	3.0	9.2	5.8	.6	.1
16	3.8	1.2	.8	8.8	1.0	.8	9.2	2.3	4.7	6.6	.4	.1
17	104	1.2	.8	8.0	.9	1.0	18	2.3	2.2	5.4	.4	0
18	68	1.3	.8	7.0	.9	1.4	14	2.0	2.0	3.8	.2	0
19	41	1.3	.9	6.0	.9	1.3	24	1.6	2.0	3.2	.1	0
20	*20	1.4	.9	4.7	.8	1.2	*84	1.3	5.8	2.5	0	.1
21	11	1.3	.9	4.0	.8	1.2	28	1.0	1.4	2.3	*0	*.1
22	9.2	1.3	.9	3.5	*.8	1.8	13	.8	*.8	2.3	0	0
23	3.2	1.2	1.0	2.8	1.0	1.7	12	.8	.8	2.2	0	.1
24	1.7	1.2	1.0	2.3	.8	23	11	.6	.8	2.0	0	.1
25	1.1	1.4	1.1	*2.0	1.0	105	8.6	*.6	.8	1.8	0	.1
26	.8	1.6	1.2	2.0	1.1	48	7.6	.6	.8	1.7	1.8	.1
27	.8	1.3	1.3	2.0	.9	3.0	6.2	.4	.8	1.6	.5	.1
28	.6	1.0	1.3	2.1	1.0	1.6	5.4	.4	1.0	1.6	.3	.1
29	.7	.9	1.4	2.1	-	1.6	4.7	.4	1.3	1.4	.4	.1
30	.8	1.0	1.4	2.2	-----	1.6	4.2	.3	1.0	1.4	.2	.1
31	.8	-----	1.5	2.2	-----	1.6	-----	.2	-----	1.3	.1	-----
Total	282.8	42.1	30.8	127.0	56.2	221.0	437.7	237.0	85.2	324.1	152.7	7.3
Mean	9.12	1.40	0.99	4.10	2.01	7.13	14.6	7.65	2.84	10.5	4.93	0.24
Ac-ft	561	84	61	252	111	438	868	470	169	643	303	14

Calendar year 1960: Max 104 Min 0 Mean 8.45 Ac-ft 6,140

Water year 1960-61: Max 134 Min 0 Mean 5.49 Ac-ft 3,970

Peak discharge (base, 1,000 cfs).--July 12 (6 p.m.) 1,330 cfs (4.42 ft); Aug. 3 (3 p.m.) 1,430 cfs (4.58 ft).

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Dec. 6-27, Jan. 12-18, Feb. 10-14. No gage-height record Dec. 28 to Jan. 11, Jan. 19 to Feb. 9, Feb. 15-21 (stage-discharge relation affected by ice during parts of periods), Mar. 26 to Apr. 2, Apr. 11-19, Aug. 4-10.

## 7-1260. Purgatoire River near Alfalfa, Colo.

Location.--Lat  $37^{\circ}11'30''$ , long  $104^{\circ}07'30''$ , in NW $\frac{1}{4}$  sec. 9, T.33 S., R.60 W., on right bank 700 ft downstream from San Francisco Creek,  $\frac{1}{2}$  miles southeast of Alfalfa, and 20 miles east of Trinidad.

Drainage area.--1,320 sq mi.

Records available.--March 1905 to September 1907, March 1924 to September 1928, October 1951 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Published as "Purgatory River" 1905-7.

Gage.--Water-stage recorder. Altitude of gage is 5,280 ft (from topographic map). Mar. 22, 1905, to Sept. 30, 1907, staff gage 650 ft downstream at different datum. Feb. 27, 1924, to Sept. 30, 1928, water-stage recorder 1 mile downstream at different datum. Oct. 1, 1951, to July 5, 1955, water-stage recorder at site 150 ft upstream at datum 3.0 ft higher.

Average discharge.--16 years, 59.1 cfs (42,790 acre-ft per year).

Extremes.--Maximum discharge during year, 5,700 cfs July 13 (gage height, 12.50 ft); minimum daily, 2.6 cfs Oct. 7, 8.

1905-7, 1924-28, 1951-61: Maximum discharge, 41,900 cfs May 19, 1955 (gage height, 31.9 ft, from floodmarks, present site and datum), from rating curve extended above 2,700 cfs on basis of slope-area measurements at gage heights 9.79, 13.35, 15.75, 30.60, and 31.9 ft; no flow at times in most years.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 29,000 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-14, Apr. 4 to May 11, June 3-14, July 13 to Aug. 28, Sept. 21, 22)

1.5	2.2	2.3	28	4.0	415
1.7	5.5	2.6	62	5.0	805
1.9	11	3.0	125	6.5	1,450
2.1	18	3.5	245		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	37					20	15	9.2	23	40	44
2	4.2	35					17	16	9.2	20	176	36
3	4.2	35					*16	16	137	20	576	33
4	4.1	34	20				40	164	48	20	288	31
5	4.1	34				20	38	*51	34	20	123	29
6	*3.1	34		14	12		46	22	35	42	72	28
7	2.6	35					51	18	78	104	68	27
8	2.6	35	(*)				71	19	51	39	62	*26
9	2.8	36			(*)	*19	82	19	*35	40	56	25
10	3.4	42				15	132	12	32	36	44	26
11	3.4	40	25			14	236	9.5	35	155	*32	33
12	3.2	38		(*)		13	172	8.0	39	323	52	56
13	3.1	38				13	188	8.6	39	*1,340	66	39
14	4.2	38				13	183	13	84	319	155	33
15	50	36		12		14	170	13	111	120	68	29
16	43	33			15	14	230	14	93	84	199	27
17	503	34				17	207	12	74	86	97	26
18	681	31				21	165	10	66	65	105	25
19	191	27				20	165	9.5	58	43	97	25
20	*72	27	20			19	*179	8.9	97	23	100	27
21	57	27				18	98	9.8	74	217	*58	*20
22	42	28		7	(*)	16	52	12	*58	253	38	19
23	40	34				17	40	12	66	107	29	21
24	38	40				23	28	13	62	95	31	22
25	39	45		(*)	18	121	25	*12	52	82	33	24
26	40	44				107	23	14	43	70	38	27
27	40	42				48	22	14	42	55	205	27
28	38	38	16			21	20	13	29	42	62	32
29	37	30		8	-	20	19	24	29	100	95	35
30	40	26				24	16	12	28	60	48	35
31	42					22		9.8		50	92	
Total	2,042.6	1,053	631	334	411	789	2,751	6,041	1,647.4	4,054	3,205	887
Mean	65.9	35.1	20	11	15	25.5	91.7	19.5	54.9	131	103	29.6
Ac-ft	4,050	2,090	1,250	662	815	1,560	5,460	1,200	3,270	8,040	6,360	1,760

Calendar year 1960: Max 681 Min 0.5 Mean 29.8 Ac-ft 21,640  
Water year 1960-61: Max 1,340 Min 2.6 Mean 50.4 Ac-ft 36,520

Peak discharge (base, 2,000 cfs).--July 13 (2:30 a.m.) 5,700 cfs (12.50 ft); July 21 (10 p.m.) 2,200 cfs (8.00 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29 to Dec. 14, Jan. 12-26, Feb. 10, 11, Mar. 3-8. No gage-height record Dec. 15 to Jan. 11, Jan. 27 to Feb. 9, Feb. 12 to Mar. 2 (stage-discharge relation affected by ice during most of periods), July 18-20, July 23 to Aug. 2, Aug. 5-10, Sept. 3-7.

## ARKANSAS RIVER BASIN

7-1265. Purgatoire River at Ninemile Dam, near Higbee, Colo.

Location.--Lat 37°44', long 103°29', in NW¼ sec. 7, T.27 S., R.54 W., on left bank 850 ft upstream from Ninemile Dam, 4 miles southwest of Higbee, and 5½ miles upstream from Smith Canyon.

Drainage area.--2,900 sq mi.

Records available.--October 1924 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 4,240.59 ft above mean sea level, datum of 1929. Prior to Oct. 28, 1934, water-stage recorder at site 550 ft downstream at datum 0.60 ft higher. Oct. 28, 1934, to May 19, 1955, water-stage recorder (destroyed by flood) at present site and datum. May 25, 1955, to June 13, 1956, staff or chain gages at nearby sites at different datums. June 14, 1956, to Dec. 5, 1956, chain gage at present site and datum.

Average discharge.--37 years, 104 cfs (75,290 acre-ft per year).

Extremes.--Maximum discharge during year, 5,650 cfs July 13 (gage height, 5.71 ft); no flow Oct. 1-15.  
1924-61: Maximum discharge, 80,000 cfs May 19, 1955 (gage height, 17.7 ft), from rating curve extended above 20,200 cfs on basis of computation of peak flow over dam; no flow at times.

Remarks.--Records poor. Diversions for irrigation of about 32,000 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 18 to Dec. 7, Apr. 19 to May 22, June 19 to July 7, Aug. 28-31, Sept. 16-20)

2.3	0	2.8	16	3.3	160
2.4	1.0	2.9	29	3.4	235
2.5	3.0	3.0	47	3.7	570
2.6	6.0	3.1	70	4.0	1,030
2.7	10	3.2	108	4.3	1,560

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	14	15		14	21	38	21	13	13	13	33
2	0	14	21		14	*20	31	25	21	12	31	54
3	0	14	19		13	21	24	*22	38	11	40	31
4	0	14	20		14	21	19	24	56	8.8	374	33
5	0	14	20		15	22	24	24	100	5.7	341	40
6	0	14	12		15	28	33	54	89	3.9	212	63
7	0	14	10		14	33	52	68	428	*32	*93	38
8	0	14	9.5		14	33	65	52	292	130	52	*29
9	0	15	9.0		19	34	63	38	182	160	43	24
10	0	*15	8.5		24	28	97	31	100	89	78	21
11	0	16		(*)	29	25	113	24	65	70	36	20
12	0	15			26	22	144	22	33	931	416	16
13	0	17			45	21	*205	19	21	1,400	168	15
14	0	19			254	20	212	16	*22	1,200	155	22
15	0	17		7	*150	20	235	16	29	326	292	29
16	1.6	15			78	*19	264	13	71	144	139	28
17	17	15			47	22	282	12	144	61	*70	20
18	554	15			38	29	311	14	155	29	303	15
19	840	14			25	28	282	14	89	21	254	*14
20	311	14			21	34	244	15	*63	17	155	55
21	139	14			19	36	220	15	61	80	129	61
22	70	14			16	29	212	13	100	154	139	28
23	56	13			16	28	144	*14	89	352	74	20
24	40	12			31	22	97	12	63	124	45	16
25	*36	12			16	20	63	12	61	36	29	14
26	29	12			16	36	47	12	61	15	26	12
27	25	12			21	118	*33	12	49	12	24	10
28	21	13			22	97	26	12	38	8.0	171	11
29	19	11			-	*65	22	12	33	6.0	139	10
30	16	10		(*)	-----	45	22	12	22	4.2	56	8.4
31	14	-----			-----	34	-----	13	-----	14	*65	-----
Total	2188.6	422	301.5	217	1026	1031	3624	663	2588	5469.6	4162	790.4
Mean	70.6	14.1	9.73	7	36.6	33.3	121	21.4	86.3	176	134	26.3
Ac-ft	4,340	837	598	430	2,040	2,040	7,190	1,320	5,130	10,850	8,260	1,570

Calendar year 1960: Max 1,050 Min 0 Mean 56.9 Ac-ft 41,290  
Water year 1960-61: Max 1,400 Min 0 Mean 61.6 Ac-ft 44,600

Peak discharge (base, 3,000 cfs).--July 13 (11 p.m.) 5,650 cfs (5.71 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29 to Dec. 1, Dec. 8 to Feb. 10.

7-1285. Purgatoire River near Las Animas, Colo.

Location.--Lat 38°02'02", long 103°12'00", in sec.23, T.23 S., R.52 W., near left bank on downstream side of pier of bridge on State Highway 101, 2.3 miles southwest of courthouse in Las Animas and 4.5 miles upstream from mouth.

Drainage area.--3,503 sq mi.

Records available.--May to September 1889, July to October 1909 (gage heights and discharge measurements only), January 1922 to September 1931, July 1948 to September 1961. Monthly discharge only for some periods, published in WSP 1311. Published as Purgatoire Creek at Las Animas in 1889 and as Purgatory River near Las Animas in 1909.

Gage.--Water-stage recorder. Datum of gage is 3,877.94 ft above mean sea level, datum of 1929. May 22 to Sept. 30, 1889, staff gage, July 31 to Oct. 9, 1909, chain gage, and Apr. 1, 1922, to June 30, 1924, water-stage recorder, at railroad bridge 4 miles downstream at various datums. July 1, 1924, to Sept. 30, 1931, water-stage recorder at present site at various datums and July 23, 1948, to Sept. 30, 1955, at datum 2.00 ft higher.

Average discharge.--22 years (1922-31, 1948-61), 142 cfs (102,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,060 cfs July 8 (gage height, 5.65 ft); minimum daily, 0.5 cfs May 30.

1889, 1922-31, 1948-61: Maximum discharge, 70,000 cfs May 20, 1955 (gage height, 17.00 ft, present datum), from rating curve extended above 38,000 cfs by logarithmic plotting; no flow at times in 1924-25, 1927, 1949.

Greatest flood known occurred Oct. 1, 1904.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made four times a month. Diversions for irrigation of about 36,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	9.9	2.2	1.2	5.9	2.7	5.5	9.5	0.9	8.5	4.2	1.6
2	1.3	8.9	2.0	1.1	4.4	2.4	4.7	7.5	4.6	9.0	4.2	1.3
3	1.4	7.8	3.1	1.1	2.8	2.2	4.7	8.5	5.7	3.6	1.8	9.8
4	1.4	7.3	5.3	1.0	1.8	1.9	4.5	1.4	2.3	2.8	1.00	1.5
5	1.4	6.2	5.3	8.9	1.4	2.1	4.5	1.0	4.2	2.5	1.75	7.6
6	1.4	4.0	2.9	7.3	1.2	1.9	5.3	9.0	2.7	3.9	1.29	5.5
7	1.4	2.0	2.4	7.8	1.8	2.0	5.3	3.0	3.4	5.0	1.11	1.2
8	1.4	5.7	1.9	8.9	1.9	2.0	4.4	4.1	7.0	8.33	9.2	1.5
9	1.4	2.0	2.4	9.9	1.7	1.8	6.7	2.7	4.5	6.3	1.05	8.0
10	1.4	2.2	2.8	9.9	2.6	2.1	8.5	1.5	4.8	3.5	3.2	4.2
11	1.4	2.2	3.0	9.4	5.2	2.4	8.7	7.0	4.2	2.4	1.11	4.6
12	1.3	2.0	1.2	7.3	5.7	1.6	9.5	1.7	3.6	9.5	1.98	4.2
13	1.1	1.5	1.0	6.8	3.9	1.1	1.71	5.0	3.6	4.30	1.35	3.2
14	1.5	1.7	1.1	1.7	6.9	8.4	1.54	5.3	2.9	1.260	1.17	2.7
15	7.3	1.5	1.2	2.4	1.54	2.2	1.78	4.6	4.4	3.00	1.71	3.2
16	2.2	1.7	1.5	3.0	1.12	2.4	1.82	2.8	5.5	2.11	1.88	3.2
17	2.2	2.1	2.0	3.3	8.1	3.2	1.38	2.5	4.5	1.23	1.14	3.2
18	1.8	1.7	2.5	2.3	6.7	4.7	1.68	3.6	8.0	9.2	9.5	3.5
19	6.90	1.6	3.7	2.1	5.7	4.9	1.44	2.1	6.5	7.0	1.55	3.8
20	1.71	1.4	3.8	1.7	4.5	3.7	9.3	2.5	2.2	5.7	1.43	5.5
21	8.3	1.4	3.0	1.6	3.7	5.2	7.5	3.9	1.0	1.05	1.23	4.6
22	6.1	4.0	3.4	2.1	3.2	5.0	9.4	2.3	1.1	2.30	9.5	1.5
23	4.7	4.0	3.5	2.3	2.9	5.0	5.7	2.5	6.0	2.06	7.0	1.2
24	3.9	3.6	3.4	2.9	2.8	4.4	3.5	1.9	7.0	1.88	2.9	1.2
25	2.5	3.6	3.5	2.2	3.1	3.4	1.8	1.5	6.5	8.5	1.6	1.2
26	2.4	2.2	2.7	2.2	2.7	3.4	7.0	1.1	6.5	4.7	8.6	2.0
27	1.7	2.0	2.0	3.7	2.7	3.1	4.2	.9	9.5	2.9	5.5	1.7
28	7.3	1.5	1.5	1.5	2.9	1.10	3.2	.9	3.9	1.7	4.2	1.3
29	5.0	1.7	1.0	2.0	-	9.3	3.9	.7	2.3	9.8	1.9	1.1
30	3.6	1.6	1.1	1.6	-----	8.7	2.5	.5	2.1	5.9	5.7	1.3
31	4.3	-----	1.3	1.5	-----	6.9	-----	.7	-----	5.1	2.0	-----
Total	1,226.0	349.2	777	521.2	1,228	1,135.4	2,250.8	225.5	870.3	4,556.1	2,644.7	272.8
Mean	39.5	11.6	25.1	16.8	43.9	36.6	75.0	7.27	29.0	147	85.3	9.09
Ac-ft	2,430	693	1,540	1,030	2,440	2,250	4,460	447	1,730	9,040	5,250	541

Calendar year 1960: Max 2,450 Min 1.1 Mean 55.4 Ac-ft 40,190  
 Water year 1960-61: Max 1,260 Min 0.5 Mean 44.0 Ac-ft 31,850

Peak discharge (base, 6,000 cfs).--No peak above base.

Note.--No gage-height record Oct. 1-11, Dec. 6, 7, Dec. 11 to Jan. 3, Aug. 7-10. Stage-discharge relation affected by ice Nov. 27 to Jan. 13, Jan. 15, 16, 26, 27, Jan. 31 to Feb. 3, Feb. 5, 6.



## ARKANSAS RIVER BASIN

7-1300. John Martin Reservoir at Caddoa, Colo.

Location.--Lat 38°04'05", long 102°56'13", in NE¼NW¼ sec.8, T.23 S., R.49 W., at dam on Arkansas River at Caddoa, 3.2 miles southeast of Hasty and 58 miles upstream from Colorado-Kansas State line.

Records available.--January 1943 to September 1961.

Gage.--Water-stage recorder and staff gage. Datum of gage is 3,760.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark); gage readings have been reduced to elevations above mean sea level.

Extremes.--Maximum contents during year, 22,560 acre-ft Apr. 2 (elevation, 3,797.23 ft); no contents for several months.

1943-61: Maximum contents, 360,300 acre-ft July 27, 1958 (elevation, 3,850.44 ft); no contents at times in 1943, 1945-47, 1952-57, 1959-60.

Remarks.--Reservoir is formed by concrete and earth-fill dam. Storage began while dam was under construction prior to 1943, and record of contents began Jan. 1, 1943. Capacity, 645,500 acre-ft at elevation 3,870.00 ft (top of spillway gates), of which 366,600 acre-ft (between elevations 3,769.0 ft, elevation of no contents, and 3,850.97 ft) is for conservation and 278,900 acre-ft (between elevations 3,850.97 and 3,870.00 ft) is reserved for flood control. No dead storage. Figures given herein represent total contents.

Cooperation.--Record of contents furnished by Corps of Engineers.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	-	0	-
Oct. 31.....	-	0	-
Nov. 30.....	-	0	-
Dec. 31.....	3,787.84	6,260	+6,260
Calendar year 1960.....	-	-	-3,580
Jan. 31.....	3,791.00	10,630	+4,370
Feb. 28.....	3,794.80	17,400	+6,770
Mar. 31.....	3,797.06	22,170	+4,770
Apr. 30.....	-	0	-22,170
May 31.....	-	0	0
June 30.....	-	0	0
July 31.....	-	0	0
Aug. 31.....	-	0	0
Sept. 30.....	-	0	0
Water year 1960-61.....	-	-	0

† Elevation at 12 p.m.

7-1305. Arkansas River below John Martin Reservoir, Colo.

Location.--Lat 38°05'02", long 102°55'10", in NW<sup>1</sup> sec. 4, T. 23 S., R. 49 W., on left bank 1.1 miles upstream from Caddoa Creek, 1.7 miles downstream from John Martin Dam, and 2.9 miles southeast of Hasty.

Drainage area.--18,917 sq mi, of which 785 sq mi is probably noncontributing.

Records available.--March 1938 to September 1961. Published as "at Caddoa" prior to October 1947.

Gage.--Water-stage recorder. Datum of gage is 3,737.40 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Feb. 22, 1940, at site 3 miles upstream at datum 22.83 ft higher. Feb. 22, 1940, to Feb. 4, 1943, at site 700 ft upstream at datum 3.64 ft higher than present datum.

Average discharge.--23 years, 361 cfs (261,400 acre-ft per year), adjusted for storage in John Martin Reservoir.

Extremes.--Maximum discharge during year, 1,840 cfs July 1 (gage height, 3.75 ft); minimum daily, 1.8 cfs Dec. 20 to Jan. 2. 1938-61: Maximum discharge, 40,000 cfs Apr. 24, 1942 (gage height, 10.46 ft, site and datum then in use), from rating curve extended above 12,000 cfs on basis of flow-over-dam and critical-depth measurement of peak flow; no flow at times in 1945-47; minimum daily prior to construction of John Martin Reservoir, 5 cfs July 16, 1939.

Remarks.--Records excellent. Storage and diversions above station for irrigation of about 438,000 acres and for flood control. Flow regulated by John Martin Reservoir (see preceding page).

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.3	1.8	1.1	100
.4	4.3	1.5	220
.5	9.0	2.0	440
.6	18	3.0	1,110
.8	43		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	120	14	1.8	6.6	3.0	3.6	46	415	613	*159	260
2	17	*90	3.8	1.8	3.6	3.0	3.6	54	526	520	192	192
3	16	75	3.8	3.3	4.0	3.0	*49	46	324	314	120	178
4	*14	77	3.6	*6.2	3.8	3.0	105	83	5.7	368	420	244
5	14	54	3.6	2.6	4.3	3.0	108	90	3.6	*415	568	304
6	14	51	3.3	2.0	9.0	3.0	108	67	3.6	440	598	*390
7	14	71	*3.3	2.3	5.7	2.8	162	63	3.6	368	526	415
8	14	61	3.3	2.0	*4.0	2.8	168	81	*3.6	586	460	440
9	9.9	*54	3.0	2.3	3.3	3.0	144	*73	3.6	974	435	460
10	*8.1	63	2.8	2.6	3.3	2.8	*147	65	3.0	556	405	405
11	7.1	73	2.8	2.6	3.0	2.8	147	53	2.8	475	*480	430
12	7.6	77	*2.6	2.6	3.0	2.8	372	40	2.6	381	622	*450
13	9.9	67	2.3	2.6	3.0	*2.8	*604	38	2.6	470	520	425
14	12	56	2.3	2.3	3.0	3.0	628	38	2.3	604	415	440
15	20	51	2.3	2.3	3.0	3.0	646	34	2.3	950	628	440
16	40	46	2.0	2.3	3.0	3.3	640	*40	2.6	562	*830	445
17	38	49	2.0	*2.6	3.0	3.6	709	39	2.6	280	860	445
18	81	57	2.0	2.8	3.0	3.6	*742	33	2.6	*196	363	475
19	*199	56	2.0	3.0	3.0	3.3	735	36	*171	206	496	*465
20	616	51	1.8	3.0	3.0	3.3	774	43	304	168	634	410
21	*480	51	1.8	3.3	3.0	3.3	808	51	300	125	574	425
22	244	*51	1.8	3.3	3.0	3.3	830	51	425	240	*532	455
23	152	43	1.8	3.6	3.0	3.3	808	59	616	210	430	420
24	130	43	1.8	3.6	2.8	3.3	*822	49	670	292	386	490
25	141	48	1.8	*3.6	3.0	3.0	838	85	652	284	322	485
26	*144	51	1.8	3.8	3.0	3.0	830	202	728	147	276	*465
27	133	40	1.8	3.6	3.0	3.3	875	350	*768	92	213	455
28	125	*28	1.8	3.6	3.0	3.6	754	470	146	65	*220	440
29	110	28	1.8	3.6	-	3.8	48	363	248	51	256	332
30	112	22	1.8	3.6	-----	3.6	36	309	345	40	386	292
31	100	-----	1.8	4.0	-----	3.6	-----	381	-----	128	381	-----
Total	3,039.6	1,704	86.4	92.6	1,014	98.0	3,644.2	3,432	6,685.1	11,120	13,707	12,042
Mean	98.1	56.8	2.79	2.99	3.62	3.16	455	111	223	359	442	401
Ac-ft	6,030	3,380	171	184	201	194	27,060	6,810	13,260	22,060	27,190	23,880

Calendar year 1960: Max 1,230 Min 1.8 Mean 166 Ac-ft 120,800  
 Water year 1960-61: Max 974 Min 1.8 Mean 180 Ac-ft 130,400

\* Discharge measurement made on this day.

ARKANSAS RIVER BASIN

7-1330. Arkansas River at Lamar, Colo.

Location.--Lat 38°06'15", long 102°37'08", in SE $\frac{1}{4}$  sec.30, T.22 S., R.46 W., on right bank 450 ft upstream from bridge on U. S. Highways 50 and 287 and 1.2 miles north of city hall in Lamar.

Drainage area.--19,780 sq mi, of which 950 sq mi is probably noncontributing.

Records available.--May 1913 to September 1955, April 1959 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 3,599.81 ft above mean sea level, datum of 1929. Prior to June 4, 1941, at site 450 ft downstream on highway bridge at datum 5.07 ft higher. June 4, 1941, to Apr. 3, 1946, at site 1,250 ft downstream and Apr. 4, 1946, to Sept. 30, 1955, at site 600 ft downstream, both at datum 4.07 ft higher.

Average discharge.--44 years, 241 cfs (174,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,440 cfs July 8 (gage height, 7.24 ft); minimum daily, 2.6 cfs Jan. 27. 1913-55, 1959-61: Maximum discharge, 130,000 cfs June 5, 1921 (gage height, 17.0 ft, present datum), from rating curve extended above 10,000 cfs by logarithmic plotting and confirmed by relationship of discharges at La Junta 60 miles upstream and Syracuse 52 miles downstream; no flow at times in 1913-15, 1953.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements made two or more times a month. Flow regulated by John Martin Reservoir (see elsewhere in this report). Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals and diversions for irrigation of about 487,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61, except periods of ice effect  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 6)

Oct. 1 to Apr. 12

Apr. 13 to Sept. 30

3.0	2.3	3.4	26	3.0	2.3	3.6	52
3.1	5.0	3.6	53	3.1	5.0	4.0	123
3.2	10	4.0	142	3.2	10	5.0	376
3.3	17	4.4	242	3.3	17	6.0	710
				3.4	26	7.0	1,260

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	4.5	3.9	4.2	3.6	3.6	20	14	17	12	3.9	5.5
2	3.6	4.2	3.9	4.2	3.6	5.5	18	12	162	230	6.5	5.5
3	3.6	4.2	3.9	b 4.5	3.6	22	17	11	984	14	11	5.5
4	3.6	4.5	4.2	b 4.2	4.2	22	57	11	370	11	15	5.0
5	3.6	4.5	3.9	b 3.9	4.5	18	91	11	107	10	32	5.0
6	3.9	3.9	4.2	b 3.6	4.5	19	95	10	64	11	36	4.7
7	3.9	3.6	4.2	3.4	4.7	20	110	8.0	52	5.54	26	4.7
8	3.9	3.6	4.5	3.9	4.7	22	197	7.5	45	464	24	4.7
9	4.2	3.6	4.5	4.7	5.0	22	167	7.5	41	270	41	4.7
10	4.2	3.6	4.5	4.5	4.7	22	162	7.5	37	226	51	4.7
11	4.2	3.6	4.5	4.5	5.0	23	160	6.5	32	44	55	5.0
12	4.2	3.1	4.2	4.5	5.2	22	78	6.0	32	37	82	5.0
13	4.2	3.1	4.2	4.5	4.8	21	151	6.0	32	8.0	226	4.7
14	3.9	3.1	b 4.5	3.9	4.3	22	207	6.0	33	31	44	4.7
15	3.6	2.8	4.2	3.9	4.1	21	234	5.5	17	103	34	4.7
16	3.6	2.8	b 4.2	3.9	4.0	22	202	6.0	8.0	153	265	5.0
17	3.4	3.4	b 4.5	3.9	3.7	30	216	6.0	7.0	18	330	5.0
18	4.2	3.4	4.5	3.9	3.5	34	278	6.0	7.0	7.0	325	7.5
19	4.5	3.4	4.2	3.9	3.7	31	284	5.5	7.5	5.5	51	11
20	6.6	3.1	4.5	3.9	3.9	24	270	5.0	27	5.5	82	7.5
21	127	3.6	4.2	3.9	3.9	22	281	4.7	49	5.0	69	5.5
22	16	3.9	4.2	3.6	3.9	19	297	5.0	41	4.2	60	5.0
23	10	4.2	4.2	3.6	4.2	17	295	5.0	162	3.9	32	11
24	8.5	4.2	4.5	b 3.4	4.5	18	292	4.7	176	3.4	23	18
25	7.0	4.2	4.5	b 3.4	3.6	18	311	4.7	169	3.6	12	23
26	5.5	4.2	4.5	b 3.1	3.6	19	319	5.0	158	3.4	7.5	10
27	5.5	3.9	4.5	b 2.6	3.9	22	336	8.0	247	3.1	7.5	17
28	5.0	5.5	4.5	2.8	3.9	21	341	16	111	3.6	7.5	11
29	4.7	3.6	b 4.2	3.1	-	22	136	20	12	3.1	6.0	7.5
30	4.5	3.9	b 4.2	3.4	-----	21	16	9.5	15	3.1	5.0	4.5
31	4.5	-----	4.5	3.6	-----	20	-----	9.0	-----	2.8	6.0	-----
Total	338.4	113.2	133.2	118.4	116.8	645.1	5638	249.6	3221.5	2253.2	1975.9	222.6
Mean	10.9	3.77	4.30	3.82	4.17	20.8	188	8.05	107	72.7	63.7	7.42
Ac-ft	671	225	264	235	232	1,280	11,180	495	6,390	4,470	3,920	442

Calendar year 1960: Max 996

Min 2.8

Mean 55.0

Ac-ft 39,940

Water year 1960-61: Max 984

Min 2.6

Mean 41.2

Ac-ft 29,800

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 28 to Feb. 7 (stage-discharge relation affected by ice during part of period), Feb. 11-19.

## ARKANSAS RIVER BASIN

101

7-1370. Frontier ditch near Coolidge, Kans.

Location.--Lat 38°02'18", long 102°02'19", in NE $\frac{1}{4}$  sec.21, T.23 S., R.43 W., on left bank 0.3 mile east of Colorado-Kansas State line, 0.5 mile downstream from Holly drain diversion, 1.5 miles west of Coolidge, and 2.3 miles downstream from diversion from Arkansas River.

Records available.--October 1950 to September 1961.

Gage.--Water-stage recorders and Parshall flume. Datum of gage is 3,353.14 ft above mean sea level, datum of 1929.

Extremes.--1950-61: Maximum daily discharge, 70 cfs May 7, 1959; no flow for many days.

Remarks.--Records excellent. This ditch diverts water from Arkansas River in Colorado for use in Kansas. These records and records for Arkansas River near Coolidge represent total flow of Arkansas River at the Colorado-Kansas State line.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24						0	23	28	5.6	24	15
2	25						0	18	35	10	29	20
3	25						0	22	26	12	35	32
4	25						0	24	23	7.0	31	42
5	22						0	22	7.7	7.0	28	40
6	21						0	24	2.1	37	31	39
7	21						0	19	15	50	38	40
8	23						0	15	2.3	51	33	43
9	23						0	23	11	46	34	40
10	21						0	41	21	38	48	42
11	21						0	37	9.0	41	44	*41
12	25						0	36	5.8	43	47	44
13	25						0	34	4.6	17	25	45
14	27						0	34	4.6	23	0	51
15	27						0	35	8.7	31	0	49
16	27						0	34	5.0	47	8.2	49
17	31						0	31	4.3	48	47	51
18	20						0	33	3.7	43	54	51
19	0						0	30	3.3	26	39	58
20	0						0	33	3.3	15	26	27
21	0						15	40	3.2	15	26	42
22	.7						28	44	3.5	28	26	41
23	0						23	41	7.9	21	24	41
24	0						24	35	9.5	19	20	46
25	0						*23	34	11	14	19	45
26	0						28	32	*12	12	16	36
27	0						35	30	15	11	15	24
28	0						36	30	13	6.2	14	26
29	0						42	*30	8.2	18	*11	26
30	0				-----		36	35	7.9	41	12	18
31	0	-----			-----		-----	30	-----	28	9.8	-----
Total	433.7	0	0	0	0	0	290	949	315.6	810.8	814.0	1164
Mean	14.0	0	0	0	0	0	9.67	30.6	10.5	26.2	26.3	38.8
Ac-ft	860	0	0	0	0	0	575	1,880	626	1,610	1,610	2,310

Calendar year 1960: Max 57 Min 0 Mean 10.6 Ac-ft 7,700  
 Water year 1960-61: Max 58 Min 0 Mean 13.1 Ac-ft 9,470

\* Discharge measurement made on this day.



## ARKANSAS RIVER BASIN

7-1375. Arkansas River near Coolidge, Kans.

Location.--Lat 38°01'33", long 102°01'00", in NW¼ sec. 26, T.23 S., R.43 W., on right bank 1,560 ft upstream from highway bridge, 1 mile south of Coolidge, and 1½ miles downstream from Colorado-Kansas State line.

Drainage area.--25,410 sq mi, of which 1,708 sq mi is probably noncontributing.

Records available.--May to October 1903, March to May 1921, October 1950 to September 1961. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 3,333.84 ft above mean sea level, datum of 1929. May 5 to Oct. 31, 1903, staff gage on upstream side of bridge 1,560 ft downstream at different datum. Mar. 1 to May 31, 1921, water-stage recorder at bridge 1,560 ft downstream at different datum.

Average discharge.--11 years, 189 cfs (136,800 acre-ft per year).

Extremes.--Maximum discharge during year, 3,650 cfs June 4 (gage height, 5.77 ft); minimum daily, 1.4 cfs Oct. 6, 7.  
1903, 1921, 1950-61: Maximum discharge, 60,000 cfs May 15, 1951 (gage height, 10.67 ft), from rating curve extended above 11,000 cfs by logarithmic plotting; no flow for many days in 1903, 1954, 1960.

Remarks.--Records good except those for periods of ice effect, which are fair. Discharge measurements made at least six times a month. Combined flow of river and Frontier ditch (see preceding page) represents entire flow that enters Kansas. Flow regulated by John Martin Reservoir (see elsewhere in this report). Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, ground-water withdrawals and diversion for irrigation of about 500,000 acres, and return flow from irrigated areas.

Rating tables, water year 1960-61, except periods of ice effect  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 28)

Oct. 1 to Dec. 31, Jan. 1 to June 12,  
June 13 to July 11, July 12 to Aug. 26  
Aug. 27 to Sept. 30

2.0	0.4	2.5	51	2.1	1.3	3.1	300
2.1	1.7	2.6	86	2.2	3.6	3.5	550
2.2	6.0	3.0	280	2.3	9.0	4.0	960
2.3	16	3.5	615	2.4	23	4.5	1,500
2.4	31			2.5	42	5.0	2,210
				2.8	135	5.5	3,100

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	79	58	b90	160	114	100	104	4.1	58	4.9	43
2	1.6	62	65	90	124	124	104	88	125	65	5.2	31
3	1.7	62	65	90	118	124	104	81	1,920	142	5.2	18
4	1.6	68	62	100	107	107	104	78	2,630	104	4.7	12
5	1.6	68	68	104	140	100	97	72	879	65	3.6	8.0
6	1.4	62	65	b100	104	100	114	61	636	49	3.4	7.0
7	1.4	62	65	100	114	114	124	64	396	72	3.4	5.6
8	1.6	62	76	100	110	114	155	72	478	372	4.1	9.0
9	2.1	65	100	110	118	104	190	61	282	526	4.2	5.6
10	2.1	72	95	118	114	104	190	40	218	353	2.0	5.6
11	2.1	62	86	107	104	100	185	31	185	322	1.5	10
12	2.1	54	79	94	100	100	175	27	160	452	1.6	20
13	2.1	58	65	100	104	100	180	25	156	270	5.30	15
14	2.6	58	65	110	121	110	190	27	156	170	4.14	15
15	3.4	62	72	114	124	121	270	25	142	124	2.24	16
16	3.4	62	65	118	121	121	246	25	156	132	1.65	13
17	4.7	58	62	107	121	121	234	20	137	190	2.24	13
18	26	54	62	110	118	114	212	20	127	150	4.26	15
19	54	58	72	107	104	110	258	22	127	107	4.59	30
20	54	51	95	110	100	107	246	19	114	90	2.76	100
21	68	54	100	110	100	107	229	53	104	81	2.24	79
22	132	65	95	b104	104	100	218	20	100	72	2.40	72
23	109	68	95	b97	107	110	234	10	65	61	2.29	72
24	72	62	95	b94	107	100	264	7.4	86	53	1.96	86
25	65	54	b91	b100	104	100	240	6.3	142	47	1.75	156
26	58	51	b82	b100	104	100	240	5.8	161	47	1.55	205
27	58	49	b82	b84	114	94	264	5.2	205	38	1.23	235
28	47	51	b79	b60	114	94	288	4.7	205	36	82	265
29	47	58	b72	b114	-	94	294	4.7	195	31	51	286
30	54	68	b65	b124	-----	94	190	4.1	79	6.8	47	265
31	62	-----	b68	b135	-----	94	-----	4.1	-----	3.6	47	-----
Total	943.1	1,819	2,366	3,201	3,180	3,296	5,939	1,087.3	1,037.0	4,289.4	4,414.5	2,112.8
Mean	30.4	60.6	76.3	103	114	106	198	35.1	346	138	142	70.4
Ac-ft	1,870	3,610	4,690	6,350	6,310	6,540	11,780	2,160	20,570	8,510	8,760	4,190

Calendar year 1960: Max 829 Min 0 Mean 145 Ac-ft 105,500  
Water year 1960-61: Max 2,630 Min 1.4 Mean 118 Ac-ft 85,340

b Stage-discharge relation affected by ice.

## 8-2135. Rio Grande at Thirtymile Bridge, near Creede, Colo.

Location.--Lat 37°43'30", long 107°15'20", in NE¼ sec.13, T.40 N., R.4 W., on right bank 70 ft below bridge, 500 ft upstream from Squaw Creek, three-quarters of a mile downstream from Rio Grande Reservoir, and 20 miles southwest of Creede.

Drainage area.--163 sq mi.

Records available.--June 1909 to September 1923, May 1925 to September 1961. No winter records 1910, 1926. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 9,300 ft (from topographic map). June 1, 1909, to Apr. 7, 1912, chain gage at site about a quarter of a mile downstream at different datum. Apr. 8, 1912, to Sept. 30, 1923, staff or chain gage 500 ft upstream at different datum. May 16, 1925, to Sept. 30, 1934, water-stage recorder at present site at datum 0.40 ft higher.

Average discharge.--48 years (1910-23, 1926-61), 219 cfs (158,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,690 cfs June 10 (gage height, 4.19 ft); minimum daily, 0.1 cfs Nov. 2-4.

1909-23, 1925-61: Maximum discharge, 7,500 cfs June 28, 1927 (gage height, 7.03 ft, present datum), from rating curve extended above 1,200 cfs; minimum daily, 0.1 cfs Nov. 2-4, 1960.

Remarks.--Records good except those for period of no gage-height record, which are fair. Flow regulated by Rio Grande Reservoir (capacity, 51,110 acre-ft) since 1912. Natural flow of stream affected by transmountain diversions from Colorado River basin to drainage area above station through Raber-Lohr and Fuchs ditches (see elsewhere in this report). No known diversion above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.0	0	0.5	8.5	2.2	250
.1	.4	.7	18	2.6	410
.2	.9	1.0	38	3.0	660
.3	2.0	1.3	67	4.0	1,490
.4	5.0	1.7	130	5.0	2,640

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	13						320	1,260	285	100	84
2	44	.1						452	1,240	268	116	77
3	44	.1						*560	1,170	244	135	109
4	45	.1						566	1,100	257	139	109
5	43	.2						296	1,180	229	137	107
6	*42	.3						215	1,350	212	112	105
7	40	.4						168	1,470	212	98	94
8	40	.3					3.8	139	1,500	208	*100	90
9	45	.3						137	1,570	200	92	117
10	64	.4						241	1,660	180	90	134
11	72							590	1,580	*163	88	125
12	59							702	1,510	155	132	102
13	55							476	1,400	144	117	97
14	56							274	*1,300	139	112	94
15	54	(*)						268	1,190	134	98	95
16	53		2.5	2.9	3.2	3.5		422	1,100	126	114	98
17	60						4.0	71	994	121	141	92
18	65							121	906	117	148	105
19	63							121	986	114	125	134
20	66							121	1,070	110	107	123
21	72	1.6						121	842	681	114	109
22	76							107	1,030	611	102	97
23	79							112	1,320	548	97	92
24	83							152	1,310	482	92	94
25	75							155	*1,260	434	92	92
26	*76							68	1,340	400	112	97
27	52							71	1,490	360	105	86
28	46							121	1,560	324	98	83
29	35							144	1,360	310	94	77
30	30							192	1,260	320	95	89
31	34							1280		89	89	
Total	1,710	4,72	77.5	89.9	89.6	108.5	1,738.0	23,238	29,538	4,708	3,306	3,311
Mean	55.2	1.57	2.5	2.9	3.2	3.5	57.9	750	985	152	107	110
Ac-ft	3,390	94	154	178	178	215	3,450	46,090	58,590	9,340	6,560	6,570

Calendar year 1960: Max 1,140 Min 0.1 Mean 205 Ac-ft 148,600  
 Water year 1960-61: Max 1,660 Min 0.1 Mean 186 Ac-ft 134,800

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 11 to Apr. 17.

## RIO GRANDE BASIN

8-2145. North Clear Creek below Continental Reservoir, Colo.  
(Formerly published as Clear Creek below Continental Reservoir)

Location--Lat 37°53'18" (revised), long 107°12'10", in NE<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec. 21, T.42 N., R.3 W., on left bank 100 ft below bridge, 1,000 ft downstream from Continental Reservoir, and 15 miles west of Creede.

Drainage area--51.7 sq mi.

Records available--May 1929 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1960, published as Clear Creek below Continental Reservoir.

Gage--Water-stage recorder and concrete control. Altitude of gage is 10,200 ft (from topographic map). Prior to Oct. 2, 1951, at site 150 ft upstream at different datum.

Average discharge--32 years, 31.2 cfs (22,590 acre-ft per year).

Extremes--Maximum discharge during year, 235 cfs May 31 (gage height, 2.70 ft); minimum daily, 0.4 cfs Oct. 31.  
1929-61: Maximum discharge, 362 cfs May 8, 1952 (gage height, 3.66 ft), from rating curve extended above 120 cfs; no flow June 22, 23, 1935.

Remarks--Records good except those for period of no gage-height record, which are fair. Flow regulated by Continental Reservoir (capacity, 26,720 acre-ft). No diversion above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.5	0.2	1.1	8.0
.6	.5	1.3	16
.7	1.0	1.5	30
.8	2.0	1.8	62
.9	3.5	2.2	120
1.0	5.5	2.7	235

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0.5	0.5	0.5				96	192	120	19	19
2	.5	.5	.5	.5				113	108	108	19	21
3	.5	.5	.5	.5				128	32	110	20	20
4	.5	.5	.5	.5				150	22	170	26	19
5	.5	.5	.5	.5				126	15	185	27	19
6	.5	.5	.5	.5				83	12	154	29	16
7	.5	.5	.5	.5				62	20	130	30	14
8	.5	.5	.5	.5				30	52	68	*20	16
9	.5	.5	.5	.5				16	91	48	7.2	18
10	.5	.5	.5	.5				20	134	35	7.0	18
11	.5	.5	.5	.5			8.5	37	170	*31	7.0	*18
12	.5	.5	.5	.5				47	195	36	20	18
13	.5	.5	.5	.5				80	40	35	34	18
14	.5	.5	.5	.5				70	*1.9	31	29	18
15	.5	*.5	.5	.5				66	2.6	29	29	18
16	.5	.5	.5	.5	8.5	8.5		85	3.0	29	20	18
17	.5	.5	.5	.5				117	15	21	14	14
18	.5	.5	.5	.5				146	37	15	13	10
19	.5	.5	.5	.5				175	39	15	19	11
20	.5	.5	.5	.5				180	39	15	28	12
21	.5	.5	.5	.5			9.0	132	78	17	27	14
22	.5	.5	.5	.5			11	100	110	21	23	20
23	.5	.5	.5	.5			11	102	103	20	21	21
24	.5	.5	.5	.5			11	103	110	15	18	22
25	.5	.5	.5	.5			11	*103	117	12	17	26
26	*.5	.5	.5	5.2			11	108	152	14	17	28
27	.5	.5	.5	8.5			11	115	180	17	15	25
28	.5	.5	.5	8.5			*27	140	188	17	13	22
29	.5	.5	.5	8.5			70	175	172	18	13	21
30	.5	.5	.5	8.5			88	200	142	17	13	21
31	.4	-----	.5	8.5	-----		-----	225	-----	17	16	-----
Total	16.4	15.1	15.5	60.2	238.0	263.5	430.0	3,330	2,572.5	1,570	610.2	556
Mean	0.53	0.50	0.50	1.94	8.5	8.5	14.3	107	85.8	50.6	19.7	18.5
Ac-ft	33	30	31	119	472	523	853	6,600	5,100	3,110	1,210	1,100
Calendar year 1960: Max 265 Min - Mean 31.4 Ac-ft 22,820												
Water year 1960-61: Max 225 Min 0.4 Mean 26.5 Ac-ft 19,180												

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 26 to Apr. 21.

8-2165. Willow Creek at Creede, Colo.

Location.--Lat 37°51'20", long 106°55'40", in SE $\frac{1}{4}$  sec.25, T.42 N., R.1 W., on left bank at north city limits of Creede, 8 ft upstream from entrance to paved channel just downstream from Windy Gulch, half a mile downstream from confluence of East and West Willow Creeks, and 2 $\frac{1}{2}$  miles upstream from mouth.

Drainage area.--35.3 sq mi.

Records available.--May 1951 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 8,880 ft (from topographic map). Prior to Sept. 2, 1953, at site 17 ft upstream at same datum.

Average discharge.--10 years, 21.5 cfs (15,570 acre-ft per year).

Extremes.--Maximum discharge during year, 134 cfs May 22 (gage height, 2.87 ft); minimum not determined.

1951-61: Maximum discharge, 430 cfs June 5, 1957; maximum gage height, 4.16 ft May 23, 1958; minimum daily discharge, 0.2 cfs Mar. 25, 1956, probably caused by snowslide upstream.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversions above station for municipal supply of Creede.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	1.7	1.8	27
1.3	3.5	2.0	42
1.4	6.5	2.5	95
1.6	16		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	7.8	4.7				4.4	3.6	6.6	22	*13	14
2	7.0	7.0	4.7				6.0	4.5	*6.2	22	22	12
3	7.0	*7.0	5.0				*7.5	*4.6	5.4	20	3.3	16
4	6.5	7.0	4.7				9.6	4.0	4.9	20	27	15
5	6.5	6.5	4.4				9.2	2.8	4.9	19	25	16
6	6.2	6.5	5.0			(*)	5.6	2.3	4.7	18	22	*16
7	6.2	8.3	*5.6				5.6	2.1	4.8	18	21	15
8	6.2	6.2	5.3			3	4.7	2.0	5.0	19	20	16
9	6.5	5.9	5.0				4.4	2.4	5.2	18	19	22
10	*8.8	4.4	4.6				5.0	4.0	4.9	16	19	21
11	9.2	5.6	4.8				4.4	5.6	4.6	*15	18	19
12	7.8	5.3	4.6				4.7	5.9	4.5	14	20	18
13	7.4	5.6	4.6				5.3	4.1	*4.2	12	18	18
14	7.0	5.3	4.6		(*)		4.4	3.3	4.0	12	16	16
15	7.4	5.0	4.6		3	3	4.1	3.0	4.0	12	15	16
16	8.3	4.1	4				4.7	3.0	3.9	12	18	17
17	9.2	5.3	3.8	(*)			6.5	3.3	3.7	12	18	16
18	9.2	5.0	3.8				11	4.6	3.6	12	18	18
19	8.8	5.3	4				14	6.9	3.6	11	16	20
20	8.8	5.0	4.2				15	6.0	3.5	12	15	20
21	8.3	5.0	4.4				16	6.3	3.3	14	16	20
22	8.3	5.0	4.4				16	8.1	3.2	13	14	21
23	8.3	4.7	4.4			4	19	*7.1	3.0	9.6	14	22
24	8.3	5.0	4.2				16	6.5	2.9	9.2	14	20
25	7.8	5.0	4				11	7.2	2.8	9.2	15	20
26	7.8	4.7	4				11	7.0	2.6	10	15	19
27	8.3	5.0	4				12	7.0	2.5	13	13	19
28	8.3	4.7	4.2				18	7.0	2.5	13	12	19
29	6.5	4.7	3.6				23	7.5	2.5	14	12	19
30	6.2	5.0	3.2				2.9	7.8	2.5	14	12	18
31	6.5	-----	3		-----		-----	7.0	-----	14	14	-----
Total	235.1	166.9	135.4	93	84	109	307.1	156.5	1200	449.0	544	538
Mean	7.58	5.56	4.37	3	3	3.5	10.2	50.5	40.0	14.5	17.5	17.9
Ac-ft	466	331	269	184	167	216	609	3,100	2,380	891	1,080	1,070

Calendar year 1960: Max 179 Min 3 Mean 24.8 Ac-ft 18,020

Water year 1960-61: Max 81 Min - Mean 14.9 Ac-ft 10,760

Peak discharge (base, 120 cfs).--May 19 (8 p.m.) 123 cfs (2.76 ft); May 22 (8 p.m.) 134 cfs (2.87 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 10-13, Dec. 17 to Apr. 3 (stage-discharge relation affected by ice during most of periods).



## RIO GRANDE BASIN

8-2175. Rio Grande at Wagonwheel Gap, Colo.

Location.--Lat 37°46'00", long 106°49'50", in NE $\frac{1}{4}$  sec. 35, T.41 N., R.1 E., on right bank 250 ft upstream from private bridge, 0.2 mile upstream from Goose Creek, and 0.3 mile west of town of Wagonwheel Gap.

Drainage area.--780 sq mi.

Records available.--May 1951 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 8,431.26 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 491 cfs (355,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,020 cfs May 29 (gage height, 4.56 ft); minimum daily, 60 cfs for several days in December and January.

1951-61: Maximum discharge, 4,870 cfs July 26, 1957 (gage height, 5.38 ft); minimum daily, 46 cfs Dec. 9, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by three reservoirs (total capacity, 121,400 acre-ft). Diversions above station for irrigation. Transmountain diversions to drainage area above station from Colorado River basin (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	110	2.5	710
1.3	144	3.0	1,100
1.6	232	4.0	2,200
2.0	415	4.5	2,920

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	158	150	85	70	75	85	130	986	2,620	745	*271	258
2	149	140	85	60	75	90	130	1,230	*2,340	675	324	245
3	151	*124	85	60	75	100	*140	*1,380	2,070	634	425	262
4	151	121	90	60	75	100	166	1,520	1,810	640	430	306
5	154	120	80	65	70	100	232	1,190	1,840	696	450	298
6	151	121	60	60	65	*95	186	858	1,930	628	365	*284
7	149	128	*65	65	65	95	171	717	2,190	598	324	266
8	146	128	70	65	70	100	140	622	2,200	598	316	254
9	146	120	70	65	75	95	123	465	2,400	492	306	320
10	*171	110	70	65	75	90	120	592	2,580	460	284	482
11	198	110	65	65	75	95	132	1,070	2,530	*425	284	390
12	201	110	70	70	75	110	132	1,360	2,480	390	329	338
13	177	110	65	65	75	120	168	1,260	*2,370	375	375	306
14	168	110	70	65	*75	110	158	922	2,020	365	338	288
15	174	100	60	70	75	120	136	773	1,900	360	306	280
16	180	100	60	70	75	120	142	898	1,780	329	306	293
17	195	100	60	*65	80	120	189	1,170	1,610	320	342	284
18	208	100	60	65	75	120	288	1,460	1,510	311	425	284
19	201	100	70	65	70	120	430	1,950	1,390	293	380	445
20	195	100	75	65	75	120	604	2,170	1,320	288	334	410
21	189	100	75	65	70	120	580	1,930	1,230	298	324	415
22	186	100	80	65	75	120	498	1,950	1,190	293	302	415
23	189	100	70	70	80	130	492	*2,440	1,080	266	284	445
24	195	100	65	80	75	130	504	2,410	1,030	254	275	445
25	189	100	60	80	85	130	420	2,320	970	241	280	405
26	183	110	60	75	95	120	395	2,400	890	241	284	380
27	186	95	65	75	85	130	311	2,640	874	275	271	365
28	189	80	70	70	85	130	415	2,840	829	271	262	347
29	180	75	65	65	-	140	568	2,730	815	280	249	334
30	140	80	60	70	-----	140	745	2,570	822	288	236	324
31	140	-----	65	70	-----	130	-----	2,610	-----	284	266	-----
Total	5,389	3,242	2,150	2,085	2,120	3,525	8,845	49,433	50,620	12,613	9,947	10,168
Mean	174	108	69.4	67.3	75.7	114	295	1,595	1,687	407	321	339
Ac-ft	10,690	6,430	4,260	4,140	4,200	6,990	17,540	98,050	100,400	25,020	19,730	20,170

Calendar year 1960: Max 3,210 Min 60 Mean 563 Ac-ft 408,400  
 Water year 1960-61: Max 2,840 Min 60 Mean 439 Ac-ft 317,600

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 1, Nov. 10 to Jan. 16, Feb. 15 to Mar. 5, Apr. 10. No gage-height record Jan. 17 to Feb. 14, Mar. 6 to Apr. 3 (stage-discharge relation affected by ice during most of periods).

## 8-2185. Goose Creek at Wagonwheel Gap, Colo.

Location.--Lat 37°45'07", long 106°49'46", in SW<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec.35, T.41 N., R.1 E., on left bank a quarter of a mile downstream from Pierce Creek, 1 mile upstream from mouth, 1 mile south of Wagonwheel Gap, and 8.8 miles southeast of Creede.

Drainage area.--90 sq mi, approximately.

Records available.--June 1954 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,460 ft (from topographic map).

Average discharge.--7 years, 56.6 cfs (40,980 acre-ft per year).

Extremes.--Maximum discharge during year, 298 cfs May 30 (gage height, 3.67 ft); minimum daily, 11 cfs Nov. 28, 29.

1954-61: Maximum discharge, 645 cfs July 27, 1957 (gage height, 4.44 ft); minimum daily, 9.6 cfs Nov. 15, 16, Dec. 5, 1956. Flood in June 1927 is the greatest known including those in October 1911 and June 18, 1949. Flood in October 1911 probably exceeded that of June 18, 1949, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Several small diversions above station for irrigation. Lake Humphreys (capacity, 842 acre-ft) above station with a fixed spillway and no gates has slight effect on flow.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	8.0	2.7	33	3.2	134
2.5	17	2.8	46	3.4	195
2.6	23	2.9	64	3.6	270

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	21	13	b13	16	14	13	132	246	71	25	30
2	20	20	14	12	16	16	19	142	230	64	32	27
3	20	21	16	12	17	16	31	139	198	62	71	34
4	21	19	16	13	16	16	42	129	174	60	60	32
5	20	19	13	13	15	16	41	103	173	57	66	30
6	19	20	12	13	15	16	31	82	178	53	43	28
7	19	22	17	13	14	17	30	71	178	53	38	27
8	19	21	17	13	14	16	26	64	184	59	37	25
9	20	19	16	14	14	16	22	71	192	63	37	43
10	22	18	17	14	15	16	26	98	192	51	38	50
11	24	19	17	14	15	16	26	129	192	46	38	38
12	21	19	17	14	15	17	30	147	184	42	53	34
13	20	20	17	14	15	16	38	129	174	38	42	32
14	19	20	16	14	15	19	32	103	160	37	41	28
15	20	18	15	15	15	21	27	100	164	42	38	28
16	22	13	b13	16	16	21	33	108	152	34	51	31
17	24	14	b13	16	16	19	48	127	144	31	51	29
18	23	14	b13	15	16	19	66	150	137	33	51	36
19	22	16	b15	15	15	18	75	184	137	31	43	50
20	20	16	17	15	15	18	82	188	134	32	38	48
21	21	15	16	15	16	19	77	164	124	36	37	42
22	21	15	17	14	16	21	77	198	117	31	34	41
23	21	14	16	15	16	25	86	230	110	27	36	42
24	21	14	16	17	14	26	68	216	103	26	37	41
25	21	14	16	18	15	22	50	209	98	28	37	39
26	21	16	16	17	16	20	46	212	84	32	37	38
27	21	14	16	17	16	18	55	234	79	31	33	36
28	21	11	16	16	14	20	77	246	77	30	31	35
29	21	11	b14	14	-	19	103	242	77	28	30	34
30	18	16	b13	15	-----	19	115	254	79	26	31	34
31	18	-----	b13	16	-----	18	-----	254	-----	25	31	-----
Total	640	509	473	452	428	570	1,497	4,855	4,476	1,284	1,267	1,062
Mean	20.6	17.0	15.3	14.6	15.3	18.4	49.9	157	149	41.4	40.9	35.4
Ac-ft	1,270	1,010	938	897	849	1,130	2,970	9,630	8,880	2,550	2,510	2,110

Calendar year 1960: Max 361 Min 11 Mean 61.7 Ac-ft 44,780  
 Water year 1960-61: Max 254 Min 11 Mean 48.0 Ac-ft 34,740

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-19	11p.m.	3.57	250	5-30	11p.m.	3.67	298
5-22	10p.m.	3.70	294	6-10	12p.m.	3.51	223

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 2 to Feb. 22 (stage-discharge relation affected by ice during part of period), Sept. 19-30.

## RIO GRANDE BASIN

8-2195. South Fork Rio Grande at South Fork, Colo.

Location.--Lat 37°39'40", long 106°38'50", in sec.4, T.39 N., R.3 E., on left bank near U. S. Highway 160, a quarter of a mile downstream from Church Creek, 1 1/4 miles upstream from mouth, and 1 1/2 miles southwest of village of South Fork.

Drainage area.--216 sq mi.

Records available.--August 1910 to September 1922, May 1936 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 8,221.79 ft above mean sea level, datum of 1929. Aug. 9, 1910, to Mar. 28, 1915, staff or chain gage and Mar. 29, 1915, to Sept. 30, 1922, water-stage recorder, at bridges 1 mile downstream at different datums.

Average discharge.--37 years, 213 cfs (154,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,090 cfs May 30 (gage height, 4.41 ft); minimum daily, 14 cfs Nov. 28, 29. 1910-22, 1936-61: Maximum discharge, 8,000 cfs Oct. 5, 1911 (gage height, 9.7 ft, from floodmarks, present site and datum), from rating curve extended above 1,500 cfs; minimum daily, 14 cfs Nov. 28, 29, 1960. Maximum stage known since at least 1873, that of Oct. 5, 1911. Flood of June 29, 1927, reached a stage about 1 ft lower than that of Oct. 5, 1911, from information by local resident.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Transmountain diversions from Colorado River basin to drainage area above station through Treasure Pass ditch (see elsewhere in this report). Natural flow of stream affected by a few small diversions for irrigation, slight regulation by Beaver Creek Reservoir (capacity, 4,760 acre-ft) and several smaller storage reservoirs.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Aug. 7-12, Sept. 3-18)

Oct. 1 to Dec. 31

Jan. 1 to Sept. 30

0.9	13	1.3	48	3.0	415
1.1	31	1.6	80	4.0	850
1.4	65	2.0	142	5.0	1,500
		2.5	258		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	*45	13	17	20	23	58	562	883	140	55	56
2	32	36	20	15	*20	31	61	624	810	137	67	49
3	34	25	23	15	22	32	103	610	710	146	186	67
4	37	22	23	16	21	33	146	566	637	178	153	69
5	36	24	18	16	20	34	155	466	*624	169	142	65
6	34	24	16	16	20	35	134	362	582	167	96	65
7	32	40	23	16	19	37	119	308	582	175	*76	54
8	32	33	23	16	19	35	102	275	598	175	74	51
9	32	26	21	17	20	35	91	283	624	178	74	81
10	48	20	23	*17	21	35	96	348	646	167	76	84
11	53	24	23	17	22	36	94	*518	628	160	76	67
12	*48	26	23	17	22	38	*111	602	566	155	120	*59
13	42	27	23	17	23	36	142	566	514	149	88	55
14	39	27	22	17	24	42	125	436	478	147	84	53
15	41	21	21	18	24	46	104	380	506	147	76	56
16	46	15	18	20	25	47	122	432	474	147	115	62
17	56	20	18	20	26	46	178	534	415	147	115	66
18	58	20	18	18	27	46	247	668	390	144	115	108
19	57	24	20	18	26	45	333	790	370	135	90	202
20	53	24	*22	18	27	45	418	785	342	135	76	167
21	55	*23	20	18	29	*48	412	735	317	147	74	151
22	57	23	22	17	*30	54	415	861	300	139	*72	147
23	57	20	20	18	29	64	422	894	275	137	72	155
24	57	20	20	21	27	66	370	850	236	119	83	149
25	55	20	20	23	29	62	283	830	212	68	75	132
26	55	24	20	21	31	58	264	861	189	64	74	123
27	55	20	20	21	31	56	264	900	180	*66	66	112
28	56	14	20	19	28	67	311	916	171	66	58	100
29	48	14	18	17	-	61	408	922	164	64	55	94
30	37	16	17	19	-----	66	498	944	155	59	53	93
31	36	-----	17	20	-----	62	-----	927	-----	61	59	-----
Total	1,412	717	630	555	682	1,426	6,586	19,755	13,578	4,088	2,695	2,792
Mean	45.5	23.9	20.3	17.9	24.4	46.0	220	637	453	132	86.9	93.1
Ac-ft	2,800	1,420	1,250	1,100	1,350	2,830	13,060	39,180	26,930	8,110	5,350	5,540

Calendar year 1960: Max 1,120 Min 14 Mean 190 Ac-ft 138,100

Water year 1960-61: Max 944 Min 14 Mean 150 Ac-ft 108,900

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-19	9:30p.m.	4.38	1,070	5-30	9p.m.	4.41	1,090
5-22	9:30p.m.	4.40	1,080				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17 to Mar. 27. No gage height record Dec. 21 to Mar. 21, Aug. 8-21.

## 8-2200. Rio Grande near Del Norte, Colo.

Location--Lat 37°41'20", long 106°27'40", in NW¼ sec.29, T.40 N., R.5 E., on right bank 20 ft downstream from county highway bridge, 5 miles upstream from Pinos Creek, and 6 miles west of Del Norte.

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

Records available--June 1889 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage--Water-stage recorder. Datum of gage is 7,980.25 ft above mean sea level, datum of 1929. Prior to May 16, 1908, staff gage at site 4 miles downstream at different datum. May 16, 1908, to Nov. 8, 1910, staff or chain gage on bridge at present site and datum.

Average discharge--72 years, 920 cfs (666,100 acre-ft per year).

Extremes--Maximum discharge during year, 4,260 cfs May 29 (gage height, 3.93 ft); minimum daily, 100 cfs Dec. 17.

1889-1961: Maximum discharge, 18,000 Oct. 5, 1911 (gage height, 6.80 ft), from rating curve extended above 12,900 cfs; minimum daily, 69 cfs Aug. 21, 1902.

Maximum stage known since at least 1873, that of Oct. 5, 1911, from information by local residents.

Remarks--Records good except those for periods of ice effect which are fair, and those for periods of no gage-height record, which are poor. Discharge measurements generally made twice a month. Small diversions above station for irrigation. Flow regulated by Beaver Creek Reservoir since 1910, Santa Maria Reservoir since 1912, Rio Grande Reservoir since 1913, and Continental Reservoir since 1925 (total capacity, 126,100 acre-ft), and by several smaller reservoirs. Transmountain diversions to drainage area above station from Colorado River basin (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 16-23, Sept. 16-22)

0.6	124	2.0	1,010
.8	180	2.5	1,570
1.1	335	3.0	2,320
1.5	588	4.0	4,240

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	185	237	170	125	135	165	185	1,610	3,800	983	291	389
2	180	242	160	120	131	175	194	1,970	3,500	883	341	365
3	171	189	165	130	130	180	291	2,160	3,120	830	611	389
4	177	180	165	126	125	175	407	2,290	2,700	848	656	455
5	180	185	130	130	125	170	507	1,900	2,720	866	656	443
6	180	177	120	130	125	165	431	1,450	2,720	813	527	425
7	177	194	135	135	120	160	407	1,240	3,000	804	443	395
8	174	212	150	125	130	150	347	1,080	3,020	813	419	365
9	180	185	170	120	150	165	264	937	3,230	721	413	407
10	193	162	140	115	170	190	296	1,040	3,420	656	395	641
11	248	159	160	125	190	200	291	1,610	3,420	603	371	554
12	264	165	155	125	190	205	291	2,180	3,310	547	449	481
13	237	171	150	120	185	215	377	2,130	3,140	507	507	431
14	212	174	160	115	185	220	377	1,610	2,790	488	474	401
15	217	171	130	110	182	240	313	1,350	2,660	494	431	383
16	248	153	115	115	190	250	313	1,410	2,520	455	419	383
17	296	155	100	119	175	245	413	1,810	2,260	437	468	401
18	330	156	140	115	170	220	611	2,260	2,100	431	611	365
19	318	155	180	115	160	190	830	2,900	1,970	389	547	611
20	302	150	173	110	165	190	1,190	3,270	1,830	377	474	581
21	296	145	165	105	170	195	1,180	2,970	1,690	395	443	568
22	296	150	175	110	175	208	1,100	3,000	1,580	389	419	561
23	302	145	190	115	160	258	1,090	3,600	1,460	365	389	611
24	302	145	165	125	145	296	1,080	3,600	1,380	330	425	626
25	302	147	165	130	160	269	874	3,480	1,260	286	425	581
26	291	159	190	120	180	231	822	3,580	1,180	269	425	540
27	291	162	175	135	165	189	713	3,880	1,130	302	401	507
28	296	156	185	130	160	193	830	4,050	1,080	318	389	481
29	291	129	130	120	-	180	1,080	3,990	1,050	308	371	462
30	242	150	120	115	-----	174	1,370	3,840	1,060	318	359	443
31	217	-----	125	125	-----	171	-----	3,800	-----	324	383	-----
Total	7,600	5,060	4,753	3,755	4,448	6,234	18,474	75,997	70,100	16,549	13,932	14,245
Mean	245	169	153	121	159	201	616	2,452	2,337	534	449	475
Ac-ft	15,070	10,040	9,430	7,450	8,820	12,360	36,640	150,700	139,000	32,820	27,630	28,250

Calendar year 1960: Max 4,540 Min 100 Mean 830 Ac-ft 602,100  
Water year 1960-61: Max 4,050 Min 100 Mean 661 Ac-ft 478,200

Note.--Stage-discharge relation affected by ice Nov. 17, 19, 20, 23, 24, Nov. 30 to Jan. 6. No gage-height record Dec. 17-20, Jan. 7 to Mar. 21 (stage-discharge relation affected by ice during most of period).



## RIO GRANDE BASIN

8-2205. Pinos Creek near Del Norte, Colo.

Location.--Lat 37°35'30", long 106°26'50", in sec.29, T.39 N., R.5 E., on left bank just downstream from Bennett Creek, 8 miles southwest of Del Norte.

Drainage area.--53 sq mi, approximately.

Records available.--April 1919 to September 1924, May 1936 to September 1961. No winter records prior to 1950 except water years 1941, 1944-47. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and rectangular box flume. Altitude of gage is 8,350 ft (from topographic map). May 1, 1919, to Sept. 30, 1924, staff gages at sites about 1,000 ft downstream at different datums.

Average discharge.--17 years (1940-41, 1943-47, 1949-61), 23.1 cfs (16,720 acre-ft per year).

Extremes.--Maximum discharge during year, 132 cfs May 2 (gage height, 1.67 ft); minimum not determined.  
1919-24, 1936-61: Maximum discharge not determined, occurred June 3, 1922, caused by failure of private fish-lake dam; minimum daily recorded, 1.8 cfs Sept. 26-28, 1951.

Maximum stage known since at least 1903 occurred June 3, 1922, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One small diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 20

Apr. 21 to Sept. 30

0.2	3.0	0.3	5.5
.3	6.0	.5	13
.5	15	.7	26
.7	30	1.0	55
1.0	61	1.4	100
1.5	119		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	*8.4					12	88	75	24	10	12
2	5.4	7.2					14	92	70	23	22	11
3	5.4	7.6					17	92	67	21	44	13
4	6.6	7.2					24	76	65	18	35	14
5	6.6	7.6					20	65	*62	17	33	12
6	6.5	7.6					*17	54	54	16	21	11
7	5.9	8.4					18	46	57	18	17	11
8	5.5	7.6					14	40	56	17	17	10
9	5.6	6.8					13	44	57	17	15	12
10	6.0	8.4					12	54	55	14	14	11
11	6.4	8.4					12	65	54	13	15	11
12	*5.7	8.8	(*)				16	67	49	13	38	9.4
13	5.7	9.2					22	59	46	12	25	9.0
14	5.7	9.2					17	50	45	12	20	8.6
15	6.4	7.6					17	50	49	12	*20	9.4
16	6.0	6.8	4.5	2.3	3.4	(*)	19	*52	48	11	21	11
17	7.6	7.8					27	56	46	11	18	12
18	8.4	8.3					40	69	44	12	21	17
19	8.0	8.8					51	80	44	13	17	*21
20	7.6	8.8					64	74	39	15	15	15
21	7.6	*8.0					51	69	35	16	17	14
22	7.6	7.6					55	75	30	13	15	12
23	7.6	9.6					57	75	27	11	17	13
24	8.4	7.6					50	70	26	9.8	17	12
25	8.8	9.6					37	72	24	9.4	17	11
26	8.8	7.2					33	73	23	9.4	15	11
27	8.8	8.2					8.8	75	*22	9.8	14	10
28	8.8	7.4					9.2	53	75	21	13	9.8
29	8.0	6.0					9.2	69	76	21	13	9.0
30	6.0	6.2					9.2	81	79	25	12	8.6
31	8.4	-----					10	-----	78	-----	12	-----
Total	215.2	237.9	139.5	71.3	95.2	255.2	970	2,090	1,336	429.8	600	350.8
Mean	6.94	7.93	4.5	2.3	3.4	8.23	32.3	67.4	44.5	13.9	19.4	11.7
Ac-ft	427	472	277	141	189	506	1,920	4,150	2,650	852	1,190	696

Calendar year 1960: Max 97 Min - Mean 19.8 Ac-ft 14,380

Water year 1960-61: Max 92 Min - Mean 18.6 Ac-ft 13,470

Peak discharge (base, 120 cfs)--May 2 (6 p.m.) 132 cfs (1.67 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 4-9, Nov. 27 to Mar. 23 (stage-discharge relation affected by ice during most of period), Mar. 31 to Apr. 1. Stage-discharge relation affected by ice Nov. 16-19, Mar. 24, 25, 27.

8-2215. Rio Grande near Monte Vista, Colo.

Location.--Lat 37°36'30", long 106°08'50", at west line of sec.19, T.39 N., R.8 E., on left bank 25 ft downstream from bridge on U. S. Highway 285, 2 miles north of Monte Vista, and 12 miles downstream from San Francisco Creek.

Drainage area.--1,590 sq mi, approximately.

Records available.--May 1926 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 7,654.16 ft above mean sea level, datum of 1929. May 1, 1926, to July 5, 1927, staff or slope gage near present site at datum 0.50 ft lower. July 6-22, 1927, chain gage and July 23, 1927, to Feb. 22, 1934, water-stage recorder near present site at datum 0.50 ft higher. Feb. 23, 1934, to Aug. 19, 1936, water-stage recorder at present site and datum. Aug. 20 to Dec. 30, 1936, water-stage recorder at site 75 ft downstream at present datum. Dec. 31, 1936, to Apr. 2, 1937, water-stage recorder at present site and datum. Apr. 3, 1937, to June 14, 1938, water-stage recorder at site 75 ft downstream at present datum.

Average discharge.--35 years, 331 cfs (239,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,580 cfs May 24 (gage height, 4.86 ft); minimum daily, 3.6 cfs Nov. 19.  
1926-61: Maximum discharge, 18,500 cfs June 30, 1927 (gage height, 7.35 ft, present datum, from floodmarks); minimum daily, 1.5 cfs Apr. 14, 1959.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions above station for irrigation of about 90,000 acres. Flow regulated by Beaver Creek, Santa Maria, Rio Grande, and Continental Reservoirs (total capacity, 126,100 acre-ft), and by several smaller reservoirs. Transmountain diversions to drainage area above station from Colorado River basin (see elsewhere in this report).

Rating tables, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 31

Jan. 1 to Sept. 30

2.1	0	2.4	44	2.0	4.0	3.0	320
2.2	4.0	2.5	74	2.1	10	3.5	615
2.3	20	2.8	214	2.2	20	4.0	960
				2.5	85	4.5	1,330
				2.6	117		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	10	68	105	130	115	4.6	397	911	131	71	164
2	108	10	*78	100	130	105	4.0	520	834	91	*98	117
3	96	10	83	105	130	110	5.2	602	1,020	140	199	117
4	78	10	83	110	125	95	6.4	701	897	179	117	199
5	74	10	62	110	120	88	17	*687	862	219	101	150
6	71	8.8	50	110	115	69	*38	608	855	204	51	85
7	65	8.8	60	110	115	44	19	532	1,040	184	20	40
8	65	7.2	80	110	115	38	12	414	1,040	179	*17	28
9	44	7.2	110	*115	120	30	8.2	314	981	114	26	38
10	50	7.2	140	120	125	22	7.6	292	1,020	83	76	179
11	68	7.2	150	125	135	20	7.0	589	1,060	95	101	117
12	*87	7.2	160	130	135	24	7.0	862	1,020	164	111	*58
13	83	5.6	170	130	135	24	7.0	799	883	145	104	40
14	74	5.6	155	130	135	*26	8.8	628	841	136	67	36
15	74	7.2	145	130	140	24	8.8	589	827	159	69	19
16	108	7.2	120	125	140	18	7.6	570	820	122	71	16
17	169	5.6	130	120	145	15	*7.6	757	715	111	131	51
18	155	*5.6	145	125	135	14	13	827	708	140	174	88
19	65	3.6	155	130	130	15	104	988	660	164	126	214
20	42	7.2	*160	130	*135	14	348	1,150	*532	155	64	250
21	32	34	155	130	130	9.4	265	897	556	*155	47	145
22	18	18	160	130	145	5.8	189	925	550	131	*62	104
23	14	14	165	130	140	7.0	282	1,270	544	71	60	111
24	12	8.8	155	130	120	10	364	1,230	478	85	67	179
25	10	14	145	135	125	13	265	1,040	424	71	80	136
26	8.8	10	135	130	130	8.8	224	*1,060	370	74	95	71
27	8.8	12	130	125	125	5.2	136	1,260	287	104	58	49
28	*8.8	27	130	120	120	4.6	101	1,270	*234	136	71	44
29	8.8	34	125	115	-	5.2	320	1,270	169	98	91	24
30	10	39	120	*125	-----	4.6	424	1,140	136	91	107	20
31	10	-----	115	125	-----	4.6	-----	1,100	-----	80	136	-----
Total	1,825.2	362.0	3,839	3,765	3,625	988.2	3,210.8	25,288	21,274	4,011	2,668	2,889
Mean	58.9	12.1	124	121	129	31.9	107	816	709	129	86.1	96.3
Ac-ft	3,620	718	7,610	7,470	7,190	1,960	6,370	50,160	42,200	7,960	5,290	5,730

Calendar year 1960: Max 1,160 Min 3.6 Mean 249 Ac-ft 180,800  
Water year 1960-61: Max 1,270 Min 3.6 Mean 202 Ac-ft 146,300

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 7 to Mar. 4.

## RIO GRANDE BASIN

8-2230. Rio Grande at Alamosa, Colo.

Location.--Lat 37°29', long 105°53', in SE¼ sec.4, T.37 N., R.10 E., on right bank a quarter of a mile northwest of city limits of Alamosa and 9 miles upstream from Alamosa Creek.

Drainage area.--1,710 sq mi, approximately.

Records available.--May 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 7,532.66 ft above mean sea level, datum of 1929. Prior to Apr. 7, 1915, staff or chain gage and Apr. 7, 1915, to Nov. 5, 1935, water-stage recorder, at railroad and highway bridges in Alamosa 1 to 2½ miles downstream at different datums. Nov. 6, 1935, to June 30, 1942, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--49 years, 270 cfs (195,500 acre-ft per year).

Extremes.--Maximum discharge during year, 400 cfs May 25 (gage height, 3.14 ft); maximum gage height, 4.06 ft Feb. 15 (backwater from ice); minimum daily discharge, 14 cfs Oct. 10, 11.

1912-61: Maximum discharge, 14,000 cfs July 1, 1927 (gage height, 8.37 ft, site and datum then in use); maximum gage height, 10.62 ft June 20, 1949; minimum daily discharge, 1.0 cfs May 19, 1950.

Flood in October 1911 (stage, 0.2 ft lower than July 1, 1927, from floodmark) probably exceeded that of July 1, 1927, and is probably the greatest known since at least 1884, from information by local resident.

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

Rating tables, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 15-18, May 29 to June 15)

Oct. 1 to Dec. 31

Jan. 1 to Sept. 30

1.0	12	1.1	17
1.2	32	1.4	50
1.4	62	2.0	145
1.7	117	3.0	366
2.2	218		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	28	60			105	49	117	175	42	30	28
2	16	26	*67			*95	49	*49	239	42	32	33
3	15	*26	91			100	47	46	*105	40	57	45
4	16	25	106			105	46	84	105	36	58	46
5	17	24	90			90	*46	117	86	34	60	86
6	19	23				80	46	140	67	32	63	84
7	17	24				80	46	81	58	27	*64	61
8	15	23				78	49	61	173	38	53	42
9	15	22			(*)	80	46	42	193	47	46	31
10	14	23				88	42	35	127	47	42	27
11	14	23				94	40	35	108	38	33	37
12	15	23				100	40	92	134	34	38	*65
13	16	23				88	36	93	107	30	38	50
14	*17	24				84	34	57	68	28	38	44
15	20	24				84	32	45	*88	26	35	32
16	23	30	120	115	130	82	31	49	98	36	33	26
17	73	35		(*)		78	29	*65	103	34	33	24
18	176	*43				74	27	103	98	32	33	23
19	208	40				70	*26	108	112	29	54	23
20	142	39				68	29	167	107	31	88	24
21	108	38	(*)			*65	58	263	92	*34	71	87
22	85	40				63	61	102	77	32	54	72
23	69	49				61	42	77	72	33	45	49
24	57	48				58	33	288	71	33	40	37
25	49	51				58	41	268	51	30	*31	45
26	46	49				57	47	134	47	28	38	41
27	43	52				56	46	153	47	28	41	31
28	40	51				54	35	281	*45	28	35	26
29	36	62				51	31	295	44	29	32	23
30	31	59				51	50	268	42	31	29	23
31	30	-----				50	-----	175	-----	31	29	-----
Total	1,461	1,047	3,534	3,565	3,640	2,347	1,234	3,890	2,939	1,040	1,373	1,265
Mean	47.1	34.9	114	115	130	75.7	41.1	125	98.0	33.5	44.3	42.2
Ac-ft	2,900	2,080	7,010	7,070	7,220	4,660	2,450	7,720	5,830	2,060	2,720	2,510

Calendar year 1960: Max 355 Min 10 Mean 99.9 Ac-ft 72,530  
Water year 1960-61: Max 295 Min 14 Mean 74.9 Ac-ft 54,230

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 5 to Mar. 11.

Closed basin in San Luis Valley, Colo.

8-2245. Kerber Creek at Ashley Ranch, near Villa Grove, Colo.

Location.--Lat 38°15', long 106°08', in sec.7, T.46 N., R.8 E., on left bank at Ashley Ranch, 5 miles upstream from Little Kerber Creek and 10 miles west of Villa Grove.

Drainage area.--38 sq mi, approximately.

Records available.--June 1923 to September 1926 (published as Kerber Creek near Villa Grove), May 1936 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is about 9,300 ft (from topographic map).

Average discharge.--28 years, 13.1 cfs (9,480 acre-ft per year).

Extremes.--Maximum daily discharge during year, 40 cfs June 1; minimum discharge not determined.

1923-26, 1936-61: Maximum discharge, 407 cfs May 14, 1941, from rating curve extended above 140 cfs; maximum gage height, 5.04 ft May 11, 1947 (backwater from beaver dam); minimum daily discharge recorded, 0.2 cfs Sept. 3, 1950.

Maximum discharge known since at least 1872, that of May 14, 1941, from information by local residents.

Remarks.--Records fair except those for periods of backwater from beaver dam or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect  
or backwater from beaver dam  
(gage height, in feet, and discharge, in cubic feet per second)

1.6	2.2
1.7	5.0
1.9	14
2.1	31
2.3	55

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	4.2						17	40	10	5.0	3.6
2	3.0	4.2						20	38	9.5	5.4	3.9
3	3.0	5.0			(*)			20	35	9.0	5.4	6.2
4	3.3	5.0						20	31	8.6	5.4	7.4
5	3.3	3.9						19	30	8.6	3.9	8.2
6		3.9						13	30	8.6	3.6	8.3
7	3.3	3.9						12	*30	8.2	3.3	9.1
8	3.6	3.3						12	31	8.2	3.6	9.5
9	c 3.6	4.7					8	13	30	7.0	3.6	9.9
10	c 3.9	*3.3		(*)				16	30	7.0	*3.6	9.6
11	c 3.6							*20	28	6.6	3.3	9.5
12	c 3.6							18	27	6.2	4.7	8.6
13	c 3.6						(*)	13	25	6.2	9.0	*8.2
14	c 3.6							15	25	5.8	7.0	8.6
15	c 3.6							22	24	5.4	5.0	8.6
16	c 5.0			3	1.5	2	4	18	21	5.0	4.7	8.6
17	c 7.8							*12	19	20	5.4	8.2
18	c 5.8							14	18	19	4.4	8.2
19	c 4.2							14	18	18	4.4	8.2
20	*c 4.4							13	20	17	4.4	7.4
21	4.4	4	(*)					15	29	15	4.4	7.4
22	4.4							16	28	15	4.4	7.4
23	4.4				(*)	(*)		16	25	15	4.4	7.4
24	4.4							14	22	14	4.2	7.0
25	4.2							19	17	14	4.7	6.6
26	4.2							12	17	12	5.0	5.8
27	4.2							14	19	12	4.7	5.8
28	4.4							14	27	12	4.7	5.8
29	4.4	(*)						15	35	*11	5.8	5.8
30	5.4							15	35	11	5.0	5.0
31	3.0							37		4.2	3.6	
Total	125.7	121.4	93	46.5	56	124	331	634	680	189.6	142.4	223.8
Mean	4.05	4.05	3	1.5	2	4	11.0	20.5	22.7	6.12	4.59	7.46
Ac-ft	249	241	184	92	111	246	657	1,260	1,350	376	282	444

Calendar year 1960: Max 57 Min - Mean 10.2 Ac-ft 7,370  
Water year 1960-61: Max 40 Min - Mean 7.58 Ac-ft 5,490

Peak discharge (base, 70 cfs).--No peak above base.

\* Discharge measurement made on this day.

c Backwater from beaver dam.

Note.--No gage-height record Nov. 10 to Mar. 23, Mar. 27 to Apr. 17 (stage-discharge relation affected by ice during most of periods), May 7-17, May 20 to June 7, Aug. 13, 14, 24-28, Sept. 6-10.



## RIO GRANDE BASIN

Closed basin in San Luis Valley, Colo.

8-2270. Saguache Creek near Saguache, Colo.

Location.--Lat 38°10', long 106°17', in SE $\frac{1}{4}$  sec.10, T.45 N., R.6 E., on left bank just upstream from Ford Creek, 10 miles northwest of Saguache.

Drainage area.--595 sq mi.

Records available.--August 1910 to September 1912, June 1914 to September 1961. Monthly discharge only for some periods, published in WSP 1512.

Gage.--Water-stage recorder. Altitude of gage is about 8,050 ft, (estimated from nearby U. S. Coast and Geodetic Survey level line). Prior to Apr. 9, 1934, at sites three-quarters of a mile downstream at different datums.

Average discharge.--49 years, 72.0 cfs (52,130 acre-ft per year).

Extremes.--Maximum discharge during year, 155 cfs Apr. 5 (gage height, 1.08 ft); maximum gage height, 1.44 ft Jan. 30 (backwater from ice); minimum discharge not determined.

1910-12, 1914-61: Maximum discharge, 756 cfs May 2, 1928 (gage height, 5.10 ft, site and datum then in use), from rating curve extended above 250 cfs; minimum daily recorded, 8.2 cfs Dec. 22, 1950, Aug. 17, 1951.

Greatest flood known occurred in 1869. Flood in 1884 or 1886 exceeded that of May 2, 1928, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by transmountain diversions from Colorado River basin to drainage area above station through Tarbell ditch (see elsewhere in this report) and diversions above station for irrigation.

Revisions.--Records for May and June 1951 are in error. Revised records for this period are on file in District Office and will be published in a later water supply paper.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	19	0.7	66
.4	26	.9	108
.6	50	1.2	195

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	35	33			32	34	68	119	55	36	a 33
2	25	34	28			29	34	72	119	49	38	a 33
3	24	*32	30			28	47	76	108	53	63	a 42
4	24	30	32	(*)		28	77	74	99	58	70	a 52
5	24	30	26			33	122	*64	94	52	61	a 64
6	23	32	24			27	74	55	96	49	45	a 60
7	24	35	23			26	66	52	*94	50	35	a 48
8	25	36	28			24	53	49	96	50	34	a 50
9	25	28	34			26	38	45	94	53	37	a 50
10	27	25	41			28	45	50	96	*47	*32	a 46
11	28	25	44			33	*40	61	99	45	32	a 43
12	28	27	*40		30	27	35	76	96	40	38	a 40
13	27	30	35			33	45	83	92	34	47	*38
14	*27	34	34			*34	45	74	94	32	49	38
15	29	24			(*)	33	30	68	92	30	40	37
16	35			19		35	35	66	111	29	41	35
17	46					37	38	63	94	28	55	37
18	50					36	49	64	85	29	61	36
19	44					30	68	*70	85	29	50	45
20	38					30	77	83	79	30	40	47
21	34					35	70	85	72	36	38	47
22	35	30	24			32	63	83	68	38	37	44
23	35	(*)				33	61	94	66	33	33	47
24	35			(*)		41	61	96	61	27	29	47
25	35				44	44	47	94	56	25	40	44
26	35				49	34	42	96	53	28	46	41
27	35				42	33	40	108	50	29	40	40
28	37				37	36	44	111	50	30	40	a 45
29	37				-	40	49	124	*55	36	34	a 52
30	30	25			-----	40	58	130	53	34	33	61
31	28	-----			-----	36	-----	124	-----	38	a 33	-----
Total	975	902	860	589	892	1013	1587	2458	2526	1196	1307	1342
Mean	31.5	30.1	27.7	19	31.9	32.7	52.9	79.3	84.2	38.6	42.2	44.7
Ac-ft	1,930	1,790	1,710	1,170	1,770	2,010	3,150	4,880	5,010	2,370	2,590	2,660

Calendar year 1960: Max 195 Min 15 Mean 58.2 Ac-ft 42,250  
 Water year 1960-61: Max 130 Min - Mean 42.9 Ac-ft 31,040

Peak discharge (base, 210 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 16-29, Dec. 12, Dec. 15 to Feb. 24, Mar. 8, 9.

RIO GRANDE BASIN

115

Closed basin in San Luis Valley, Colo.

8-2275. North Crestone Creek near Crestone, Colo.

Location.--Lat 38°00'49", long 105°41'32", on right bank in canyon, 1½ miles northeast of Crestone, Saguache County, and 3¼ miles upstream from South Crestone Creek.

Drainage area.--10.7 sq mi.

Records available.--May 1936 to September 1961 (no winter records prior to 1948).

Gage.--Water-stage recorder. Altitude of gage is 8,360 ft (from topographic map).

Average discharge.--14 years (1947-61), 10.9 cfs (7,890 acre-ft per year).

Extremes.--Maximum discharge during year, 66 cfs June 12; maximum gage height, 1.82 ft June 9; minimum discharge not determined.  
1936-61: Maximum discharge, 735 cfs Aug. 6, 1936 (gage height, 4.33 ft), from rating curve extended above 160 cfs on basis of slope-area measurement of peak flow; minimum daily recorded, 0.4 cfs Apr. 3, 1945.  
Maximum stage known probably since at least 1884 occurred in October 1911. No flood since that in October 1911 has exceeded the flood of Aug. 6, 1936, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 17 to Nov. 15, May 16-20)

Oct. 1 to May 20

May 21 to Sept. 30

0.7	1.0	1.2	14	1.0	3.0	1.4	20
.8	2.5	1.4	27	1.1	5.5	1.6	39
1.0	7.0	1.8	76	1.2	9.0	1.8	66

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	3.7					2.4	14	51	22	6.6	12
2	3.5	3.7					2.4	17	47	19	10	10
3	3.3	3.7			(*)		2.9	15	37	18	16	13
4	3.5	3.7					3.9	13	34	16	17	13
5	3.5	3.7					4.3	11	36	17	16	15
6	3.3	3.7					3.7	8.8	37	15	13	19
7	3.5	3.7					3.7	7.9	*39	14	12	22
8	3.5	3.5					3.7	7.0	42	13	12	24
9	3.9	3.3					3.7	7.6	52	13	9.0	25
10	4.8	* 3.3		(*)			3.5	14	56	14	*8.3	26
11	4.3	3.9				1.8	3.5	*24	55	11	8.3	26
12	4.1	3.7					3.5	28	55	10	8.6	24
13	3.9	3.3					*3.7	24	53	8.6	8.6	*21
14	3.9	2.9					3.5	18	47	9.5	10	18
15	3.9	2.7					3.3	14	42	9.0	9.0	16
16	4.5	2.8	2.2	2.0	1.7		3.5	13	43	8.0	12	15
17	4.5	2.8					3.7	15	43	7.2	21	13
18	4.5	2.8					4.3	21	39	7.2	26	12
19	4.3	2.7					5.0	32	40	6.9	22	12
20	*4.1	2.7					6.0	34	42	6.6	19	12
21	4.3	2.6	(*)				2.2	6.2	34	42	6.6	17
22	4.3	2.6					*2.4	6.2	40	40	6.6	16
23	4.3	2.4			(*)		2.7	6.2	42	35	5.5	16
24	4.3	2.4					2.9	6.2	44	31	5.2	15
25	4.3	2.3					2.5	5.8	49	28	5.0	17
26	4.3	2.3					2.5	5.5	44	24	5.0	22
27	4.3	2.3					2.5	5.5	48	22	5.5	20
28	4.5	2.4					2.7	6.5	51	21	6.2	19
29	4.5	*2.4					2.9	8.8	51	*21	6.2	16
30	3.7	2.6					2.7	11	51	22	7.2	15
31	3.9						2.5		48		6.9	14
Total	125.0	90.6	68.2	62.0	47.6	64.5	142.1	840.3	1176	310.9	451.4	433.2
Mean	4.03	3.02	2.2	2.0	1.7	2.08	4.74	27.1	39.2	10.0	14.6	14.4
Ac-ft	248	180	135	123	94	128	282	1,670	2,330	617	895	859

Calendar year 1960: Max 66 Min - Mean 11.5 Ac-ft 8,360

Water year 1960-61: Max 56 Min - Mean 10.4 Ac-ft 7,560

Peak discharge (base, 60 cfs).--May 29 (5 p.m.) 62 cfs (1.81 ft); June 12 (10 p.m.) 66 cfs (1.80 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Dec. 7. No gage-height record Dec. 8 to Mar. 22 (stage-discharge relation affected by ice during most of period).

## RIO GRANDE BASIN

Closed basin in San Luis Valley, Colo.

8-2305. Carnero Creek near La Garita, Colo.

Location.--Lat 37°52', long 106°19', in sec.28, T.42 N., R.6 E., on left bank 4 miles northwest of La Garita and 5½ mile downstream from North Fork.

Drainage area.--117 sq mi.

Records available.--April 1919 to September 1961. No winter records prior to water year 1945 except water years 1926, 1941. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 8,200 ft (from topographic map). Prior to Aug. 6, 1925, staff gage or water-stage recorder at site 300 ft downstream at different datum. Aug. 6, 1925, to Apr. 20, 1929, staff gage or water-stage recorder at present site and datum.

Average discharge.--19 years (1925-26, 1940-41, 1944-61), 10.9 cfs (7,890 acre-ft per year).

Extremes.--Maximum discharge during year, 175 cfs Apr. 4 (gage height, 1.64 ft), from rating curve extended above 18 cfs; minimum not determined.  
1919-61: Maximum discharge, 1,600 cfs July 21, 1945 (gage height, 5.75 ft), from rating curve extended above 160 cfs; no flow for several days during summer months in 1951, 1955-56.

Remarks.--Records poor. Diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	1.0	0.5	9.0
.3	2.3	.8	37
.4	4.4	1.0	62

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	*4.0	2.5				4.4	32	19	8.5	4.0	3.6
2	1.9	4.2	2.5				4.4	30	19	5.3	9.9	5.3
3	1.9	4.2	2.7				14	28	17	4.9	2.5	12
4	2.3	4.2	2.7	(*)			33	20	17	4.9	9.9	22
5	2.5	4.2					57	*18	17	4.2	9.0	26
6	2.3	4.2					25	16	15	4.9	6.7	26
7	2.5	4.4				3.8	12	15	*15	5.3	4.4	8.1
8	2.7	4.0					9.9	14	14	8.1	4.4	4.4
9	2.9	3.1					7.6	13	13	4.9	6.2	4.4
10	3.6	2.5					7.6	16	12	*5.8	*5.3	4.4
11	3.6	3.4					5.8	20	12	4.0	4.4	4.2
12	3.1	3.8	(*)				*8.2	21	11	3.1	4.4	3.8
13	2.9	3.6					11	22	11	2.9	7.2	*3.6
14	*2.7	3.4					13	20	12	3.1	6.2	3.6
15	3.1	3.1		1.4	(*)	*5.0	9.0	20	15	3.6	6.2	3.8
16	4.4	2.5				5.8	15	19	11	2.9	4.9	4.0
17	7.2	2.9				5.8	20	*17	9.0	2.5	4.0	4.2
18	7.6	2.9	2.8			5.3	43	16	8.1	2.7	7.2	4.2
19	6.2	2.9				5.3	37	17	8.1	3.1	5.8	4.9
20	4.4	3.1				5.8	24	18	8.1	2.9	4.4	4.9
21	4.9	*3.4				6.2	25	18	7.2	3.1	4.4	4.9
22	5.8	4.0				7.6	30	19	6.2	3.6	4.4	4.9
23	6.7	4.0				13	35	19	5.8	2.9	4.2	4.9
24	6.7	3.6		(*)		8.5	20	20	5.8	2.2	3.6	4.9
25	5.8	3.8				8.5	18	19	5.3	1.8	3.4	4.9
26	4.9	4.2				9.9	13	23	4.9	1.9	3.4	4.9
27	4.9	5.8				9.0	12	26	4.2	2.3	3.6	4.4
28	4.9	5.3				6.2	19	22	4.4	3.1	4.2	4.2
29	4.4	3.8				6.2	32	22	4.4	4.0	3.6	4.2
30	3.6	3.6				4.9	34	20	4.9	3.4	3.6	4.9
31	3.6	-----				4.9	-----	19	-----	2.5	3.6	-----
Total	1 26.2	1 12.1	86.0	43.4	64.4	1 71.1	598.9	619	3 16.4	1 18.4	1 81.5	2 04.5
Mean	4.07	3.74	2.77	1.4	2.3	5.52	20.0	20.0	10.5	3.82	5.85	6.82
Ac-ft	250	222	171	86	128	339	1,190	1,230	628	235	360	406

Calendar year 1960: Max 52 Min 0.1 Mean 8.10 Ac-ft 5,870  
Water year 1960-61: Max 57 Min - Mean 7.24 Ac-ft 5,240

Peak discharge (base, 110 cfs).--Apr. 4 (10 p.m.) 175 cfs (1.64 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 5 to Mar. 15 (stage-discharge relation affected by ice during most of period), Apr. 29 to May 2.

Closed basin in San Luis Valley, Colo.

8-2310. La Garita Creek near La Garita, Colo.

Location--Lat 37°48'50", long 106°19'10", in sec.9, T.41 N., R.6 E., on right bank 4 miles southwest of La Garita and 4½ miles downstream from Little La Garita Creek.

Drainage area--61 sq mi, approximately.

Records available--April 1919 to September 1961. No winter records prior to water year 1948 except water years 1926, 1941, 1945-46. Monthly discharge only for some periods, published in WSP 1312.

Gage--Water-stage recorder. Altitude of gage is 8,030 ft (from topographic map). Apr. 1, 1919, to June 27, 1927, staff gages and June 24, 1927, to Nov. 13, 1935, water-stage recorder, at sites within a quarter of a mile downstream at different datums.

Average discharge--18 years (1925-26, 1940-41, 1944-46, 1947-61), 13.0 cfs (9,410 acre-ft per year).

Extremes--Maximum discharge during year, 227 cfs May 13 (gage height, 1.77 ft); minimum not determined.

1919-61: Maximum discharge, 530 cfs July 9, 1957 (gage height, 3.00 ft), from rating curve extended above 140 cfs; minimum daily recorded, 0.2 cfs Sept. 28, 29, 1956.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	1.5	0.5	12
.3	4.0	.6	19
.4	7.5	.8	38

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	*6.1					4.7	24	28	11	5.0	6.1
2	3.2	5.4					4.4	32	26	8.8	7.5	4.4
3	3.2	5.4					8.4	36	25	8.8	21	6.1
4	3.0	5.4		(*)			11	36	24	8.0	10	7.2
5	3.2	5.4					19	*27	24	6.8	14	7.5
6	3.0	6.1					10	20	24	6.8	6.8	9.3
7	2.8	6.4					9.3	17	*23	7.5	5.0	6.1
8	2.8	5.4					6.1	15	21	8.0	6.1	4.7
9	2.8	5.2					5.4	18	20	7.5	6.4	5.0
10	3.2	5.0				5.0	6.8	32	20	*6.8	*5.8	5.4
11	3.8	4.6					6.1	31	19	6.1	5.8	4.7
12	3.5	5.0	(*)				*5.4	27	19	5.0	5.8	4.4
13	3.2	5.0					7.2	24	18	5.0	6.1	*4.0
14	*3.5	5.4					8.0	18	19	5.0	6.4	3.8
15	4.4	5.4			(*)	(*)	8.0	23	19	5.0	5.4	3.8
16	5.8	4.6					5.8	19	18	4.7	4.0	4.4
17	6.8	5.0					8.0	*20	16	4.4	4.0	4.0
18	6.8	5.4				4.7	15	23	15	4.4	6.8	4.0
19	6.1	5.8				4.7	20	25	14	4.7	5.8	6.1
20	5.8	5.8				4.7	25	27	14	4.4	4.7	5.4
21	5.8	*6.2					4.4	19	26	13	5.4	4.4
22	5.4	6.8					7.5	18	28	12	5.4	5.4
23	5.8	6.6					8.0	19	28	11	4.0	5.4
24	6.1	6.2		(*)			6.8	17	27	11	3.2	4.7
25	5.8	6.4					5.8	15	27	10	3.5	5.0
26	6.1	7.0					5.8	12	29		5.4	4.4
27	6.4	7.4					7.2	10	30	9.8	4.7	4.0
28	6.1	6.0					4.7	15	28	9.8	5.4	4.0
29	5.0	5.2					5.8	18	32	10	5.4	3.8
30	6.8	4.9					4.7	23	29	11	5.8	4.4
31	6.2	-----					4.4	-----	28	-----	8.0	-----
Total	145.6	170.5	117.8	55.8	61.6	164.2	360.6	806	513.4	181.6	209.6	154.2
Mean	4.70	5.68	3.8	1.8	2.2	5.30	12.0	26.0	17.1	5.86	6.76	5.14
Ac-ft	289	338	234	111	122	326	715	1,600	1,020	360	416	306

Calendar year 1960: Max 50 Min - Mean 10.2 Ac-ft 7,400  
 Water year 1960-61: Max 36 Min - Mean 8.06 Ac-ft 5,840

Peak discharge (base, 80 cfs)--Aug. 27 (7:30 p.m.) 227 cfs (1.77 ft).

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Nov. 9 to Dec. 2, Mar. 16, 17. No gage-height record Oct. 10, 11, 31, Nov. 1, Dec. 3 to Mar. 15 (stage-discharge relation affected by ice during most of period), Apr. 25.



## RIO GRANDE BASIN

8-2360. Alamosa Creek above Terrace Reservoir, Colo.

Location.--Lat 37°23', long 106°21', in sec.8, T.36 N., R.6 E., on left bank 3 miles upstream from Terrace Reservoir Dam and 15 miles northwest of Capulin.

Drainage area.--107 sq mi.

Records available.--September 1911 to September 1912 (published as Rio Alamosa near Monte Vista), May to June 1914, April 1915 to September 1927, October 1934 to September 1961. No winter records water years 1919-23. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 8,600 ft (from topographic map). Sept. 29, 1911, to Sept. 30, 1912, staff gage at ranger station 1.8 miles upstream at different datum. Apr. 25, 1914, to May 6, 1915, staff gage and May 7, 1915, to Sept. 30, 1927, water-stage recorder, near present site at different datums. Datum lowered 0.27 ft Mar. 28, 1925.

Average discharge.--35 years (1911-12, 1915-18, 1923-27, 1934-61), 116 cfs (83,980 acre-ft per year).

Extremes.--Maximum discharge during year, 880 cfs May 22; maximum gage height, 3.03 ft May 19; minimum daily discharge, 11 cfs Dec. 6, Jan. 11, 12, 14-16, 20, 21.

1911-12, 1914-27, 1934-61: Maximum discharge, 5,200 cfs Oct. 5, 1911 (gage height, 11.0 ft, site and datum then in use, from floodmark), from rating curve extended above 1,000 cfs on basis of computation of peak flow over dam about 8 miles upstream; minimum not determined.

Maximum stage known since at least 1854, that of Oct. 5, 1911, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 22-27, Aug. 5 to Sept. 23)

0.7	12	1.6	116
.8	17	2.0	225
1.0	32	2.5	460
1.3	66	3.0	800

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	17	13	13	15	16	23	460	448	84	31	49
2	15	*16	14	13	15	*17	23	520	395	80	53	43
3	15	16	16	13	16	18	32	526	355	75	123	56
4	15	17	15	13	16	18	57	460	310	70	142	56
5	16	17	13	13	15	18	78	350	305	62	125	53
6	16	17	11	13	13	16	53	260	284	61	83	51
7	14	21	*16	13	13	15	49	219	268	74	66	44
8	15	18	16	13	14	16	42	184	264	62	62	42
9	15	18	16	12	*15	17	36	193	276	65	54	58
10	16	17	16	12	15	18	42	*288	272	54	50	62
11	18	16	16	11	15	18	38	418	256	49	54	53
12	19	16	16	11	15	19	46	484	236	*45	92	49
13	*17	17	16	12	15	21	*69	400	225	48	81	45
14	16	16	17	11	15	24	53	296	212	42	72	41
15	18	16	15	11	16	30	45	300	215	41	65	43
16	18	14	13	11	16	28	63	360	*203	37	74	41
17	18	15	14	*12	16	24	105	442	190	37	72	43
18	20	15	15	12	14	21	152	514	178	37	89	99
19	24	15	16	13	13	20	196	593	173	38	69	125
20	23	16	15	11	13	*20	228	568	164	41	60	*101
21	25	16	14	11	14	20	215	490	152	46	*57	92
22	26	15	13	12	15	23	225	612	149	40	51	84
23	26	*18	13	12	17	30	253	600	132	33	58	87
24	27	16	13	13	15	35	228	544	121	30	87	83
25	27	16	13	14	17	30	173	568	110	*30	101	69
26	27	17	13	15	18	26	162	*568	103	30	91	65
27	26	14	14	14	18	24	170	550	97	30	72	60
28	26	13	*14	15	18	23	225	508	92	28	61	56
29	23	12	14	15	-	23	300	496	89	38	61	51
30	18	14	12	15	-----	25	385	490	92	31	54	48
31	16	-----	13	15	-----	23	-----	478	-----	32	53	-----
Total	610	481	445	394	427	676	3,766	13,739	6,366	1,470	2,263	1,851
Mean	19.7	16.0	14.4	12.7	15.2	21.8	126	443	212	47.4	73.0	61.7
Ac-ft	1,210	954	883	781	847	1,340	7,470	27,250	12,630	2,920	4,490	3,670

Calendar year 1960: Max 652 Min - Mean 94.2 Ac-ft 68,410  
Water year 1960-61: Max 612 Min 11 Mean 89.0 Ac-ft 64,440

Peak discharge (base, 670 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-19	10p.m.	3.03	872	5-26	9p.m.	2.78	736
5-22	10p.m.	2.99	880				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Dec. 6. No gage-height record Dec. 7 to Mar. 19 (stage-discharge relation affected by ice during most of period).

8-2380. La Jara Creek at Gallegos Ranch, near Capulin, Colo.

Location--Lat 37°12'30", long 106°11'20", in NE $\frac{1}{4}$  sec.10, T.34 N., R.7 E., on left bank 2.7 miles downstream from Canyon Del Rancho, 7 miles southwest of Capulin, and 16 $\frac{1}{2}$  miles downstream from La Jara Reservoir.

Drainage area--98 sq mi, approximately.

Records available--April 1916 to November 1917, April 1919 to November 1923, May 1936 to September 1961. No winter records prior to 1950 except water year 1944. Monthly discharge only for some periods, published in WSP 1312.

Gage--Water-stage recorder. Altitude of gage is 8,130 ft (from topographic map). Apr. 1, 1916, to Nov. 30, 1917, and Apr. 1, 1919, to Nov. 30, 1923, near present site at different datums.

Average discharge--13 years (1943-44, 1949-61), 16.3 cfs (11,800 acre-ft per year).

Extremes--Maximum discharge during year, 551 cfs Aug. 11 (gage height, 6.12 ft), from rating curve extended above 88 cfs; minimum not determined.

1916-17, 1919-23, 1936-61: Maximum discharge, 653 cfs Apr. 22, 1919, Apr. 15, 1937 (gage height, 5.94 ft, present site and datum); minimum daily recorded, 2.2 cfs Nov. 6, 1951.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. Small diversions above station for irrigation. Flow regulated by La Jara Reservoir (capacity, 14,040 acre-ft).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 18 to June 13, Aug. 11 to Sept. 19)

2.0	4.5	3.0	54
2.1	7.0	4.0	152
2.3	14	5.0	308
2.6	27		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	7.4				(*)	9.8	115	*21	7.4	14	5.2
2	6.0	7.4					14	112	20	7.4	12	4.8
3	*6.2	7.0					33	116	20	7.0	18	5.8
4	6.2	7.0					79	94	19	7.0	19	6.2
5	6.2	7.0					84	74	18	6.5	20	5.5
6	6.2	7.4					47	58	18	6.8	15	5.0
7	6.2	9.8	(*)				46	50	18	10	13	4.8
8	6.2	9.8					37	40	18	8.4	10	4.8
9	6.2	8.0			(*)		28	38	17	9.4	7.0	4.8
10	6.8	6.8					25	*45	16	7.7	8.0	5.2
11	6.5	7.0					24	45	14	6.8	27	5.0
12	6.5	*7.4					38	42	13	7.4	14	4.8
13	6.5	7.7					*49	38	13	7.7	10	4.5
14	6.5	7.0					38	35	12	6.8	8.4	4.5
15	8.0	6.5					33	29	12	6.8	9.1	4.8
16	9.1	5.5	6	4.5	6		74	27	14	6.2	12	5.0
17	11	5.2		(*)			137	29	14	6.0	10	5.2
18	9.4	5.4					182	29	11	6.0	13	6.0
19	9.1	5.4					231	29	9.8	6.2	7.0	8.0
20	8.0	5.6					224	28	*10	6.2	6.5	*6.2
21	*8.4					13	170	28	8.8	6.5	*6.5	5.8
22	8.0					*17	175	27	8.8	6.5	6.5	5.5
23	8.0					39	180	26	9.4	5.8	6.8	5.5
24	8.4					44	155	26	9.1	5.5	6.5	5.8
25	8.0	5.8				19	120	26	8.0	*5.2	7.4	5.8
26	8.4					14	95	28	8.0	6.8	7.4	6.2
27	8.8					14	85	26	7.4	5.8	8.0	7.0
28	8.8		(*)			11	88	24	7.7	14	6.5	6.8
29	8.4					11	108	24	7.4	11	5.5	6.8
30	7.4					11	116	22	7.4	9.4	5.5	7.7
31	7.0					9.4		22		9.4	5.8	
Total	232.4	198.3	186	139.5	168	352.4	2724.8	1352	389.8	229.6	325.4	169.0
Mean	7.50	6.61	6	4.5	6	11.4	90.8	43.6	13.0	7.41	10.5	5.63
Ac-ft	461	393	369	277	333	699	5,400	2,680	773	455	645	335

Calendar year 1960: Max 172 Min - Mean 16.2 Ac-ft 11,740  
Water year 1960-61: Max 231 Min - Mean 17.7 Ac-ft 12,820

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Nov. 17 to Dec. 6. No gage-height record Dec. 7 to Mar. 22 (stage-discharge relation affected by ice during most of period), Apr. 21-26.

8-2400. Rio Grande above mouth of Trinchera Creek, near La Sauses, Colo.

Note.--Records for the 1961 water year not available in time for inclusion in this report. They will be published in a subsequent annual report.

8-2405. Trinchera Creek above Turners Ranch, near Fort Garland, Colo.

Location.--Lat 37°22', long 105°17', in Sangre de Cristo Grant, on right bank just downstream from confluence of North and South Forks, 1 mile upstream from Turners Ranch and 7 miles southeast of Fort Garland, Costilla County.

Drainage area.--45 sq mi, approximately.

Records available.--April 1923 to September 1961. No winter records prior to 1935 except water year 1928. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Prior to Apr. 12, 1929, at site 200 ft upstream at different datum.

Average discharge.--28 years (1297-28, 1934-61), 25.1 cfs (18,170 acre-ft per year).

Extremes.--Maximum discharge during year, 110 cfs May 23 (gage height, 3.00 ft); minimum not determined.

1923-61: Maximum discharge, 689 cfs May 27, 1942, from rating curve extended above 240 cfs; maximum gage height, 3.73 ft May 10, 1947; minimum daily discharge recorded, 3.0 cfs Oct. 3, 1942.

Outstanding floods occurred in 1886 and in October 1911. The flood in 1886 probably exceeded that in October 1911 and the flood in October 1911 probably exceeded all subsequent floods, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	7.5	2.5	41
2.1	11	2.8	78
2.3	24	3.0	110

Discharge in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.9	11	9.6				9.2	43	104	35	17	15
2	8.9	11	9.6				9.2	53	102	33	18	14
3	9.2	11	8.9				11	54	100	31	39	18
4	*9.2	11	9.2				13	*56	96	30	29	18
5	8.9	10	8.2				14	50	91	32	26	18
6	8.9	10				7.5	13	43	83	30	21	18
7	8.9	12					12	39	84	30	19	16
8	8.9	11					11	36	*83	27	18	16
9	9.6	10		(*)			11	35	78	*26	*16	15
10	9.2	8.6					*11	40	78	25	16	15
11	9.2	10				8.4	10	49	77	24	16	15
12	9.6	10				8.6	10	57	72	23	16	15
13	9.2	10	(*)			*8.9	10	62	71	22	18	15
14	9.6	10				9.6	10	59	72	21	20	*15
15	10	9.2				11	10	56	71	20	19	15
16	12	*8.6		8.5		11	10	52	63	20	19	15
17	15	9.6				9.6	11	53	63	19	18	15
18	13	9.6	9			9.2	16	57	60	18	18	19
19	13	10				9.2	23	63	60	18	16	26
20	12	9.6			(*)	8.9	30	75	57	18	16	23
21	12	9.6				8.9	33	84	56	19	16	20
22	11	8.9				9.2	35	91	52	19	16	19
23	11	8.6				10	36	*97	50	16	15	18
24	*12	8.6				11	33	96	49	16	16	18
25	12	8.2				10	29	97	45	16	18	17
26	12	7.8				10	27	97	44	18	20	17
27	12	7.8				9.6	26	97	42	18	17	17
28	12	7.8				8.9	30	97	41	18	17	16
29	12	7.4				13	36	100	39	18	16	16
30	10	7.4		(*)		9.6	43	100	36	16	16	15
31	10					9.6		102		15	16	
Total	329.2	284.3	279.5	263.5	196	279.2	582.4	2,095	2,029	691	573	509
Mean	10.6	9.48	9.02	8.5	7	9.01	19.4	67.6	67.6	22.3	18.6	17.0
Ac-ft	653	564	554	523	389	554	1,160	4,160	4,020	1,370	1,150	1,010

Calendar year 1960: Max 85 Min - Mean 21.7 Ac-ft 15,730  
Water year 1960-61: Max 104 Min - Mean 22.2 Ac-ft 16,110

Peak discharge (base, 50 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-1	8p.m.	2.68	62	5-23	6p.m.	3.00	110
5-13	5p.m.	2.70	64	8-3	10a.m.	2.63	56

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10, 11, Nov. 16 to Dec. 2, Dec. 4, 5, Mar. 31, Apr. 9, 12. No gage-height record Dec. 6 to Mar. 13 (stage-discharge relation affected by ice during most of period).



## RIO GRANDE BASIN

8-2415. Sangre de Cristo Creek near Fort Garland, Colo.

Location.--Lat 37°26', long 105°23', in N½ sec.24, T.30 S., R.72 W., on right bank 15 ft downstream from bridge on county road, 2 miles east of Fort Garland, and 7 miles upstream from Ute Creek.

Drainage area.--187 sq mi.

Records available.--March to October 1916, April 1923 to September 1930, October 1931 to September 1961. No winter records prior to 1946 except water year 1941. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 7,940 ft (estimated from nearby U. S. Coast and Geodetic Survey level line). Mar. 15 to Oct. 9, 1916, staff gage and Cippoletti weir 1 mile downstream at site 600 ft upstream from Garland Canal at different datum.

Average discharge.--17 years (1940-41, 1945-61), 22.5 cfs (16,290 acre-ft per year).

Extremes.--Maximum discharge during year, 328 cfs Apr. 21 (gage height, 7.21 ft); minimum daily, 0.5 cfs Oct. 1. 1916, 1923-61: Maximum discharge, 1,520 cfs Aug. 31, 1936, from rating curve extended above 280 cfs on basis of slope-area measurement at gage height 6.10 ft; maximum gage height, 7.82 ft June 4, 1957; no flow at times in many years.

Outstanding floods occurred in 1886 and in October 1911. The flood in 1886 probably exceeded that in October 1911 and the flood in October 1911 probably exceeded all subsequent floods, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. A few diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 20-30)

Oct. 1 to Apr. 30				May 1 to Sept. 30			
3.8	0	4.6	20	4.5	5.6	5.6	60
3.9	.6	5.0	49	4.7	8.8	6.0	106
4.0	1.7	5.5	96	5.0	17	6.5	190
4.1	3.3	6.0	157	5.3	35		
4.2	5.3	6.5	237				
4.4	11						

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	7.6					21	154	56	16	9.9	7.9
2	.6	7.1					18	144	53	18	15	7.0
3	.7	7.1					25	149	49	15	3.7	14
4	*1.2	7.1					58	*165	48	15	3.0	17
5	1.5	7.1					59	154	45	15	16	16
6	2.0	7.1					46	126	41	17	11	16
7	2.3	8.2					24	103	41	21	8.3	14
8	2.3	11					25	88	*38	20	7.2	12
9	2.2	8.2		(*)			23	78	39	*18	*7.0	12
10	3.0	b 6.9					*30	79	35	15	6.9	12
11	3.0	b 7.4				15	25	88	32	13	7.0	11
12	3.0	b 7.1				(*)	21	106	29	11	7.7	11
13	3.1	7.4	(*)				29	128	27	15	13	9.9
14	3.3	7.1					24	136	26	14	29	*10
15	4.3	8.2					18	141	29	14	22	15
16	6.3	*8.2	4.5	3.6	8		22	110	28	12	16	11
17	12	7.4					27	98	25	11	14	10
18	13	7.6					56	103	25	11	13	11
19	11	7.6					111	106	22	11	12	16
20	10	7.4			(*)		221	116	26	10	9.9	16
21	7.6	6.9				21	214	114	21	12	8.8	13
22	7.1	6.6				*22	176	108	19	13	9.7	11
23	7.1	6.6				25	*216	*106	20	10	11	9.5
24	*7.4	6.9				39	189	102	19	8.6	8.4	9.2
25	8.2	7.1				35	139	92	20	8.3	16	9.2
26	8.5	6.6				23	117	95	18	9.5	12	8.8
27	8.5	6.6				18	103	82	17	8.8	12	8.4
28	8.5	5.1				18	111	76	16	9.2	12	8.3
29	8.8	4.5				17	125	73	17	9.0	9.7	7.9
30	b 7.9	4.6		(*)		b 16	143	66	16	7.9	8.8	7.5
31	b 7.1					b 18		61		7.4	8.6	
Total	172.0	214.3	139.5	111.6	224	552	2,416	3,347	897	395.7	408.9	341.6
Mean	5.55	7.14	4.5	3.6	8	17.8	80.5	108	29.9	12.8	13.2	11.4
Ac-ft	341	425	277	221	444	1,090	4,790	6,640	1,780	785	811	678

Calendar year 1960: Max 121 Min 0 Mean 21.0 Ac-ft 15,220  
Water year 1960-61: Max 221 Min 0.5 Mean 25.3 Ac-ft 18,280

Peak discharge (base, 75 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-5	1a.m.	5.38	85	5-1	4a.m.	6.53	196
4-21	3a.m.	7.21	328	5-15	1a.m.	6.47	184
4-23	3:30a.m.	7.17	306				

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 29 to Mar. 21 (stage-discharge relation affected by ice during most of period).

8-2425. Ute Creek near Fort Garland, Colo.

Location---Lat 37°27', long 105°26', in S½ sec.10, T.30 S., R.72 W., on left bank 1½ miles north of Fort Garland and 6 miles upstream from mouth.

Drainage area---32 sq mi, approximately.

Records available---March to October 1916, May 1923 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage---Water-stage recorder. Altitude of gage is 8,030 ft (from topographic map). Mar. 18 to Oct. 9, 1916, staff gage and Cippoletti weir at different datum.

Average discharge---38 years, 21.4 cfs (15,490 acre-ft per year).

Extremes---Maximum discharge during year, 114 cfs May 30 (gage height, 2.09 ft); minimum not determined.

1916, 1923-61: Maximum daily discharge, 630 cfs May 15, 1941; no flow July 28-31, Sept. 6-29, 1956.

Outstanding floods occurred in 1886 and in October 1911. The flood in 1886 probably exceeded that in October 1911 and the flood in October 1911 probably exceeded all subsequent floods, from information by local residents.

Remarks---Records good except those for periods of ice effect or no gage-height record, which are poor. A few diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Aug. 6 to Sept. 2, Sept. 23-30)

0.6	2.5	1.2	30
.7	5.0	1.5	55
.8	8.0	2.0	104
1.0	17		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.1	6.5	10				9.6	60	86	32	8.8	14
2	7.1	6.8	*11				8.8	62	82	32	10	12
3	7.4	7.1	b11				10	64	74	28	25	19
4	*7.4	6.8	8.5				14	*66	67	25	38	22
5	7.1	6.2	5.5				14	58	70	27	49	21
6	6.8	5.9					13	47	69	26	34	23
7	6.2	7.4				6.5	9.2	39	71	34	27	24
8	5.9	7.1					8.0	35	*75	31	24	24
9	6.2	6.5		(*)			b11	31	74	*26	*21	29
10	7.1	5.6					*14	35	75	24	19	35
11	7.4	5.9					13	50	66	22	18	31
12	7.4	6.2					12	67	62	19	22	27
13	7.1	6.8	(*)				12	73	62	16	34	22
14	7.7	6.8				(*)	11	67	60	16	31	*24
15	8.4	6.2				9.6	12	55	56	16	29	26
16	10	*b5.6		5.5	5.5		9.2	11	49	15	26	22
17	11	b6.3					8.0	12	46	53	24	22
18	11	b6.4	4.5				7.4	15	49	50	25	26
19	10	b6.4					7.1	26	58	53	11	52
20	9.6	b6.5			(*)	6.5	41	67	51	11	18	43
21	9.2	6.6				7.4	48	65	48	12	16	35
22	8.8	6.6				7.7	48	76	45	11	18	30
23	9.2	6.6				9.6	51	*80	44	9.2	17	28
24	*8.8	6.8				10	43	83	42	8.0	18	24
25	8.0	7.2				8.8	34	92	41	7.7	33	22
26	8.0	7.4				8.4	35	93	37	9.6	26	21
27	8.0	7.6				8.4	31	91	37	9.6	20	19
28	7.1	3.5				6.5	38	98	35	11	19	17
29	7.4	5.0				3.2	49	102	34	9.2	17	16
30	6.5	9.0		(*)	-----	10	55	98	31	8.8	16	16
31	6.5	-----			-----	b11	-----	81	-----	8.4	16	-----
Total	245.4	195.3	163.0	170.5	154.0	229.8	708.6	2037	1699	539.5	719.8	745
Mean	7.92	6.51	5.26	5.5	5.5	7.41	23.6	65.7	56.6	17.4	23.2	24.8
Ac-ft	487	387	323	338	305	456	1,410	4,040	3,370	1,070	1,430	1,480

Calendar year 1960: Max 124 Min - Mean 23.8 Ac-ft 17,270

Water year 1960-61: Max 102 Min - Mean 20.8 Ac-ft 15,100

Peak discharge (base, 100 cfs)---May 30 (1:30 a.m.) 114 cfs (2.09 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note---No gage-height record Nov. 21-30, Dec. 4 to Mar. 14 (stage-discharge relation affected by ice during most of periods).

## RIO GRANDE BASIN

8-2435. Trinchera Creek below Smith Reservoir, near Blanca, Colo.

Location.--Lat 37°23', long 105°33', in sec.4, T.31 S., R.73 W. (unsurveyed), on right bank 800 ft downstream from bridge, 1 mile downstream from Smith Reservoir, and 5 miles southwest of Blanca.

Drainage area.--396 sq mi.

Records available.--October 1928 to September 1961. No winter records prior to 1944 except water years 1931, 1934-36, 1938. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 7,700 ft (estimated from nearby U. S. Coast and Geodetic Survey level lines). Prior to Apr. 19, 1943, at datum 1.00 ft higher.

Average discharge.--23 years (1930-31, 1933-36, 1937-38, 1943-61), 12.0 cfs (8,690 acre-ft per year).

Extremes.--Maximum discharge during year, 152 cfs Apr. 24 (gage height, 2.42 ft); minimum daily, 0.2 cfs Oct. 7, 8.

1929-61: Maximum daily discharge, 1,340 cfs May 11, 1942; no flow Sept. 13, 14, 16, 17, 1957.  
Outstanding floods occurred in 1886 and October 1911. The flood in 1886 probably exceeded that in October 1911 and the flood in October 1911 probably exceeded all subsequent floods, from information by local residents.

Remarks.--Records good except those for period of no gage-height record, which are fair. Diversions above station for irrigation. Flow regulated by Smith Reservoir (capacity, 5,335 acre-ft).

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	0.5	0.4	0.5	0.6	0.6	0.6	98	25	16	7.2	2.6
2	2.2	.5	.4	.5	.6	.6	8.3	94	21	16	7.2	2.4
3	2.2	.5	.4	.5	.6	.6	8.3	93	17	16	7.2	1.0
4	*2.2	.5	.4	.6	.6	.6	8.3	*100	14	16	6.9	1.4
5	2.2	.5	.4	.6	.6	.6	8.3	102	12	16	6.9	2.6
6	1.2	.5	.4	.6	.6	.6	8.3	102	11	17	6.9	2.6
7	.2	.5	.4	.6	.6	.6	8.6	94	9.4	17	5.2	2.6
8	.2	.5	.4	.6	.6	.6	8.6	78	*9.0	17	4.0	2.6
9	.3	.5	.4	*.7	.6	.6	8.6	51	9.4	*17	*4.0	2.6
10	.3	.5	.4	.7	.6	.6	*8.6	32	12	17	4.0	2.4
11	.4	.5	.4	.7	.6	.5	8.6	21	14	17	4.0	2.4
12	.6	.5	.4	.7	.6	.5	8.6	16	14	14	3.8	2.6
13	1.6	.5	*.4	.7	.6	.5	8.6	16	13	10	3.5	2.6
14	1.6	.5	.4	.7	.6	*.5	8.6	27	13	9.4	3.5	*2.8
15	1.2	.4	.4	.7	.6	.5	8.6	43	13	9.4	3.8	2.8
16	.7	*.4	.4	.7	.6	.5	8.6	38	13	9.0	3.0	2.8
17	.6	.4	.4	.7	.6	.5	8.6	31	13	9.0	3.0	2.8
18	.5	.4	.5	.7	.6	.5	8.6	24	13	9.0	3.0	2.8
19	.5	.4	.5	.7	.6	.5	8.6	19	13	9.0	2.8	3.0
20	.5	.4	.5	.7	*.6	.5	8.6	16	13	8.6	2.8	3.0
21	.5	.4	.5	.7	.6	.5	18	17	13	8.6	3.0	3.0
22	.5	.4	.5	.7	.6	.5	63	18	14	8.3	3.0	3.0
23	.5	.4	.5	.7	.6	.5	107	*16	14	8.0	3.0	3.0
24	*.5	.3	.5	.7	.6	.5	137	16	14	8.0	3.0	3.0
25	.5	.4	.5	.7	.6	.5	144	19	14	7.6	2.8	3.0
26	.5	.4	.5	.7	.6	.5	127	27	14	7.6	2.8	3.0
27	.5	.4	.5	.7	.6	.5	104	33	14	7.6	2.8	3.0
28	.5	.4	.5	.7	.6	.5	86	41	15	7.6	2.8	3.0
29	.5	.4	.5	.7	.6	.5	81	51	15	7.6	2.8	3.0
30	.5	.4	.5	*.7	-----	.5	87	45	15	7.6	2.8	3.2
31	.5	-----	.5	.7	-----	.5	-----	33	-----	7.6	2.8	-----
Total	26.9	13.3	13.8	20.6	16.8	16.5	1.116.5	1.411	413.8	355.5	124.3	80.6
Mean	0.87	0.44	0.45	0.66	0.60	0.53	37.2	45.5	13.8	11.5	4.01	2.69
Ac-ft	53	26	27	41	33	33	2,210	2,800	821	705	247	160

Calendar year 1960: Max 136 Min 0.2 Mean 11.4 Ac-ft 8,250  
Water year 1960-61: Max 144 Min 0.2 Mean 9.89 Ac-ft 7,160

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 6 to Mar. 13 (stage-discharge relation affected by ice during most of period).

## 8-2445. Platoro Reservoir at Platoro, Colo.

Location--Lat 37°21'00", long 106°32'35", in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.22, T.36 N., R.4 E., on right bank in valvehouse, 400 ft downstream from Platoro Dam on Conejos River, half a mile west of Platoro,  $\frac{3}{4}$  miles downstream from Adams Fork, and 7 miles southwest of Jasper.

Drainage area--40 sq mi, approximately.

Records available--November 1951 to September 1961.

Gage--Mercury manometer. Datum of gage is 9,911.5 ft above mean sea level (Bureau of Reclamation bench mark). Gage readings have been reduced to elevations above mean sea level. Prior to June 9, 1955, mercury manometer at present site and datum. June 9, 1955, to Sept. 30, 1959, water-stage recorder in gate chamber at dam for elevations above 9,921.0 ft at same datum.

Extremes--Maximum contents observed during year, 11,530 acre-ft Oct. 1 to Nov. 1 (elevation, 9,966.4 ft); minimum 4,010 acre-ft Nov. 6 to sometime during May (elevation, 9,946.0 ft).  
1951-61: Maximum contents, 61,420 acre-ft June 9, 11, 1958 (elevation, 10,035.5 ft); no storage for long periods in most years.

Remarks--Reservoir is formed by an earth- and rock-fill dam and dikes. Dam completed Dec. 9, 1951; storage began Nov. 7, 1951. Capacity of reservoir, 60,000 acre-ft between elevations 9,911.5 (sill of trashrack at outlet) and 10,034.0 ft (crest of spillway). No dead storage. Reservoir is used for irrigation and flood control. Figures given herein represent usable contents.

Cooperation--Records furnished by Bureau of Reclamation.

## Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	9,966.4	11,530	-
Oct. 31.....	9,966.4	11,530	0
Nov. 30.....	9,946.0	4,010	-7,520
Dec. 31.....	9,946.0	4,010	0
Calendar year 1960.....	-	-	0
Jan. 31.....	9,946.0	4,010	0
Feb. 28.....	9,946.0	4,010	0
Mar. 31.....	9,946.0	4,010	0
Apr. 30.....	9,946.0	4,010	0
May 31.....	9,956.5	7,500	+3,490
June 30.....	9,956.5	7,500	0
July 31.....	9,956.2	7,400	-100
Aug. 31.....	9,956.2	7,400	0
Sept. 30.....	9,956.2	7,400	0
Water year 1960-61.....	-	-	-4,130

† Elevation at 8 a.m. on first day of following month.



## RIO GRANDE BASIN

8-2450. Conejos River below Platoro Reservoir, Colo.

Location.--Lat 37°21'20", long 106°32'35", in NW¼ sec.22, T.36 N., R.4 E., on left bank 1,500 ft downstream from valve house for Platoro Reservoir and half a mile northwest of Platoro.

Drainage area.--40 sq mi, approximately.

Records available.--May 1952 to September 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 9,866.60 ft above mean sea level (levels by Bureau of Reclamation).

Average discharge.--9 years, 82.8 cfs (59,940 acre-ft per year).

Extremes.--Maximum discharge during year, 680 cfs Nov. 8 (gage height, 3.68 ft); minimum daily, 3.5 cfs Oct. 18.  
1952-61: Maximum discharge, 1,160 cfs Nov. 1, 1957; maximum gage height, 4.29 ft June 15, 1958; no flow Oct. 16-20, 1955.  
Maximum stage known since at least 1854 occurred Oct. 5, 1911, from information by local residents.

Remarks.--Records good. No diversion above station. Flow completely regulated by Platoro Reservoir (see preceding page).

Cooperation.--Three discharge measurements furnished by Bureau of Reclamation.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.9	2.0	2.0	116
1.1	8.5	2.5	225
1.2	13	3.0	343
1.4	26	3.5	511
1.6	49	4.0	860
1.8	81		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	12						118	*576	72	18	31
2	4.1	12						157	468	71	28	31
3	4.1	12						375	416	71	36	31
4	4.1	12						488	416	71	46	31
5	4.1	12						191	413	71	50	31
6	*4.1	34						32	413	71	50	31
7	4.1	210						42	388	71	50	31
8	4.1	399						463	374	71	46	31
9	4.1	670					11	*635	374	71	44	50
10	4.1	670						*355	402	69	44	67
11	4.1	655						234	413	69	44	67
12	3.8	650						243	354	*54	44	67
13	*3.8	630						276	276	46	44	67
14	3.8	274						273	276	46	44	67
15	3.8	9.9						270	273	46	44	67
16	3.8	9.9	11	11	11	11		215	*273	45	44	67
17	3.8	9.9						193	273	31	54	45
18	3.5	10					20	261	237	22	62	37
19	7.4						30	329	187	17	62	74
20	14						35	343	168	15	62	120
21	12						40	448	168	15	61	*128
22	12						50	581	198	15	62	128
23	12						60	325	218	15	62	151
24	13	11					72	262	187	15	*62	138
25	13						74	504	118	15	78	83
26	13						76	540	*88	15	102	83
27	13						84	615	88	15	112	83
28	13						95	514	79	15	111	83
29	13						95	522	72	15	90	83
30	13						90	581	72	15	62	61
31	12							581		15	37	
Total	231.8	4,423.7	341	341	308	341	1,008	10,966	8,258	1,265	1,755	2,064
Mean	7.48	147	11	11	11	11	33.6	354	275	40.8	56.6	66.8
Ac-ft	460	8,770	676	676	611	676	2,000	21,750	16,380	2,510	3,480	4,090

Calendar year 1960: Max 670 Min 3.5 Mean 89.1 Ac-ft 64,660  
Water year 1960-61: Max 670 Min 3.5 Mean 85.8 Ac-ft 62,080

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 19 to Apr. 24.

8-2465. Conejos River near Mogote, Colo.

Location--Lat 37°03'20", long 106°11'10", in SE $\frac{1}{4}$  sec. 34, T. 33 N., R. 7 E., on right bank 25 ft upstream from bridge on State Highway 174, 0.3 mile downstream from Fox Creek, 5.3 miles west of Mogote, and 10 miles west of Antonito.

Drainage area--282 sq mi.

Records available--April 1903 to October 1905, October 1911 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Records for March 1900 at site  $5\frac{1}{2}$  miles upstream and May 1905 to September 1911 (some missing periods most years) at site  $3\frac{1}{4}$  miles upstream not equivalent to present site owing to inflow.

Gage--Water-stage recorder. Datum of gage is 8,271.54 ft above mean sea level (State Highway Department bench mark). Apr. 17, 1903, to Oct. 31, 1905, staff gage 500 ft downstream at different datum. Oct. 5, 1911, to early 1915, chain gage at present site and datum.

Average discharge--52 years, 343 cfs (248,300 acre-ft per year).

Extremes--Maximum discharge during year, 2,270 cfs May 23 (gage height, 4.50 ft); minimum daily, 30 cfs Jan. 3, 4.

1903-61: Maximum discharge, 9,000 cfs Oct. 5, 1911 (gage height, 8.50 ft, from floodmarks, present site and datum), from rating curve extended above 3,100 cfs; minimum daily determined, 10 cfs July 18, 1904.

Maximum stage known since at least 1854, that of Oct. 5, 1911, from information by local residents.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Diversions for irrigation of about 500 acres of hay meadows above station. Some regulation by Platoro Reservoir (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Apr. 4-17, Apr. 30 to June 7, July 6, 7)

0.3	21	1.5	340
.5	51	2.0	570
.7	92	3.0	1,190
1.0	169	4.0	2,130

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	73	36	35	44	51	71	1,040	1,700	245	84	132
2	43	67	39	32	45	53	71	1,160	1,540	242	83	118
3	41	67	43	30	45	57	97	1,310	1,170	259	135	122
4	41	67	41	30	44	55	175	1,700	1,030	235	149	128
5	41	67	40	31	42	54	246	1,220	1,040	225	163	122
6	41	67	39	32	40	52	178	570	1,050	232	140	122
7	41	126	39	34	39	51	169	443	1,050	273	128	113
8	41	232	38	35	40	43	138	480	967	252	125	103
9	41	523	39	36	42	52	125	1,060	954	249	120	115
10	48	670	37	37	45	61	130	1,170	1,020	213	115	149
11	49	680	45	37	48	65	122	1,030	1,020	197	140	138
12	51	670	45	37	51	67	152	1,290	960	172	191	132
13	49	664	45	36	53	69	216	1,210	812	146	181	128
14	48	590	44	37	53	71	178	912	758	132	166	122
15	53	128	43	39	53	90	154	846	834	128	160	122
16	61	79	a42	38	51	94	213	818	812	120	172	130
17	67	75	a41	37	51	92	332	834	758	118	163	130
18	73	69	a41	37	48	84	438	1,020	702	104	178	143
19	75	65	a41	35	45	77	565	1,350	631	94	163	310
20	71	65	a43	36	46	77	702	1,550	550	90	152	249
21	82	61	a42	36	48	82	565	1,320	490	88	146	259
22	84	61	a43	36	51	88	590	1,750	475	88	146	246
23	86	57	a44	37	51	101	648	1,980	490	82	200	239
24	90	55	43	40	45	113	600	1,170	475	79	188	266
25	88	59	41	44	48	104	443	1,620	398	77	242	206
26	83	59	42	43	51	88	443	1,690	306	84	252	172
27	85	57	42	46	50	88	456	1,870	284	84	239	163
28	86	40	42	44	50	82	626	2,000	273	104	216	154
29	86	41	a41	42	-	73	829	1,660	266	101	210	152
30	73	43	a39	41	-----	73	960	1,810	280	94	178	146
31	71	-----	a37	42	-----	71	-----	1,760	-----	84	157	-----
Total	1,936	5,677	1,279	1,153	1,320	2,283	1,0632	3,9643	2,3095	4,693	5,087	4,836
Mean	62.5	189	41.3	37.2	47.1	73.6	354	1,279	770	151	164	161
Ac-ft	3,840	11,260	2,540	2,290	2,620	4,530	21,090	78,640	45,810	9,310	10,090	9,590

Calendar year 1960: Max 2,050 Min 35 Mean 289 Ac-ft 209,900  
 Water year 1960-61: Max 2,000 Min 30 Mean 278 Ac-ft 201,600

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 29 to Mar. 1, Mar. 3-9.

## RIO GRANDE BASIN

8-2475. San Antonio River at Ortiz, Colo.

Location.--Lat 37°00', long 106°02', in New Mexico, in NE $\frac{1}{4}$  sec.25, T.32 N., R.8 E., on left bank a quarter of a mile south of New Mexico-Colorado State line, half a mile south of Ortiz, and half a mile upstream from Los Pinos River.

Drainage area.--110 sq mi, approximately.

Records available.--April 1919 to October 1920, October 1924 to September 1961 (no winter records prior to 1941). Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 8,000 ft (from topographic map). Prior to Apr. 7, 1926, staff gage at various locations near present site at different datums. Apr. 7, 1926, to June 24, 1954, water-stage recorder at site 200 ft downstream at present datum.

Average discharge.--21 years (1940-61), 26.6 cfs (19,260 acre-ft per year).

Extremes.--Maximum discharge during year, 1,090 cfs Apr. 4 (gage height, 4.65 ft), from rating curve extended above 350 cfs; no flow Oct. 1-12, July 18-28.

1919-20, 1924-61: Maximum discharge, 1,750 cfs Apr. 15, 1937 (gage height, 5.38 ft), from rating curve extended above 1,100 cfs; no flow at times in most years.

Maximum stage known since at least 1854 occurred Oct. 5, 1911, from information by local residents.

Remarks.--Records fair except those subsequent to June 30 and those for periods of ice effect or no gage-height record, which are poor. Discharge measurements or observations of no flow generally made twice a month. A few small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Discharge, in cubic feet per second, water year October 1900 to September 1901													
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1	0	6.3					21	405	17	4.0	6	0.6	
2	0	5.6					46	415	13	3.8	13	.5	
3	0	5.6				5.0	159	372	11	3.5	8.2	.5	
4	0	5.2					395	306	9.1	1.5	22	2.1	
5	0	5.4					244	238	7.7	.8	13	5.6	
6	0	5.4					85	136	6.2	.5	7.2	3.5	
7	0	6.5					69	117	5.6	13	3.8	2.1	
8	0	12				7.0	40	95	5.3	10	2.3	1.5	
9	0	8.7					37	102	4.6	6.6	1.2	1.0	
10	0	7.3					34	166	4.6	5.6	1.0	.9	
11	0	6.3					30	194	4.0	2.8	.8	1.6	
12	0	7.5					32	187	3.8	3.0	.2	1.5	
13	1.1	6.7				10	83	145	3.3	2.3	1.8	1.3	
14	1.5	7.8					63	103	2.6	1.0	3.8	1.0	
15	2.1	5.4					41	95	1.8	.3	4.6	.6	
16	3.8	3.4	3.5	0.5	3.5		26	85	90	4.0	2	4.0	1.0
17	5.4	2.1					24	200	86	5.9	.1	5.0	2.6
18	8.4	3.8					21	255	78	3.8	0	13	2.6
19	8.9	4.3					18	366	75	2.8	0	3.3	3.2
20	7.8	4.0					18	441	69	2.3	0	2.1	16
21	7.0	4.1					21	328	60	1.6	0	1.3	10
22	7.5	4.0					25	337	54	1.3	0	34	5.9
23	7.5	4.1					33	331	47	.9	0	140	4.0
24	8.7	4.1					41	270	47	.8	0	6.9	3.3
25	8.7	4.5					39	168	36	1.0	0	6.9	2.8
26	9.2	3.8					38	161	34	2.6	0	5.6	2.3
27	10	4.9					37	156	32	1.3	0	4.3	2.1
28	11	3.2					30	210	29	1.0	0	4.3	2.1
29	11	2.2					21	293	26	.9	8	1.8	2.1
30	8.4	1.8					20	366	21	2.3	7	.9	1.8
31	7.5						18		21		5	.6	
Total	135.5	156.0	108.5	15.5	98.0	540.0	5,346	3,886	132.1	79.0	322.9	114.9	
Mean	4.37	5.20	3.5	0.5	3.5	17.4	178	125	4.40	2.55	10.4	3.83	
Ac-ft	269	309	215	31	194	1,070	10,600	7,710	262	157	640	228	

Calendar year 1960: Max 436

Min 0

Mean 28.4

Ac-ft 20,590

Water year 1960-61: Max 441

Min 0

Mean 30.0

Ac-ft 21,680

Peak discharge (base, 330 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-4	9:30p.m.	4.65	1,090	5-2	1:30a.m.	3.61	622
4-19	9:30p.m.	4.21	885	8-22	11p.m.	4.22	1,000

Note.--Stage-discharge relation affected by ice Nov. 16 to Dec. 18. No gage-height record Dec. 19 to Mar. 27 (stage-discharge relation affected by ice during most of period), July 29 to Aug. 1.

8-2480. Los Pinos River near Ortiz, Colo.

Location.--Lat 36°59', long 106°05', in New Mexico, in NE $\frac{1}{4}$  sec.34, T.32 N., R.8 E., on left bank 1 mile south of New Mexico-Colorado State line, 2 miles southwest of Ortiz, and 2 $\frac{1}{2}$  miles upstream from mouth.

Drainage area.--167 sq mi.

Records available.--January 1915 to December 1920, October 1924 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 8,100 ft (from topographic map). Prior to Apr. 15, 1955, at site 350 ft upstream at datum 2.52 ft higher.

Average discharge.--42 years, 126 cfs (91,220 acre-ft per year).

Extremes.--Maximum discharge during year, 1,420 cfs May 2 (gage height, 5.86 ft); minimum not determined.

1915-20, 1924-61: Maximum discharge, 3,160 cfs May 12, 1941 (gage height, 5.77 ft, site and datum then in use), from rating curve extended above 1,600 cfs; minimum observed, 4.0 cfs Dec. 17, 1945 (discharge measurement), but may have been less during periods of no gage-height record.

Maximum stage known since at least 1854 occurred Oct. 5, 1911, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 23 to May 4, July 29 to Aug. 10)

2.0	5.0	2.6	67	4.0	480
2.1	10	3.0	145	5.0	975
2.3	27	3.5	280	6.0	1,570

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	16					28	970	383	54	31	21
2	10	18					35	1,050	368	54	27	13
3	11	17					63	1,000	312	47	54	20
4	12	17					135	876	262	43	53	35
5	12	17					147	692	252	37	40	39
6						15						
7	11	18					111	498	233	34	28	38
8	10	23					89	408	230	74	22	32
9	9.5	29					71	343	218	61	19	25
10	10	23					60	420	210	54	18	25
11	12	19					63	620	212	40	17	43
12	14	16					60	766	210	50	31	37
13	13	16					66	826	200	39	63	32
14	12	19					91	664	182	32	59	26
15	12	18					81	498	168	29	66	22
16	14	18	12	9	12	25	74	476	182	29	47	24
17	16	11					107	484	188	27	60	27
18	24	8.0					190	534	165	25	49	29
19	25	9.5					280	588	147	24	40	46
20	26	10					494	615	145	26	34	188
21	21	10					687	610	141	25	26	111
22	20	9.5					28	615	530	123	22	87
23	21	9.5					32	669	561	123	25	46
24	22	9.0					38	692	566	103	21	63
25	22	9.0					45	597	512	93	18	45
26	22	9.5					42	436	472	85	17	52
27	23	9.5					37	440	456	78	20	49
28	24	10					37	460	468	69	31	38
29	25	11					33	606	448	66	27	28
30	24	8.5					28	777	432	63	42	25
31	20	9.0					26	887	424	63	37	23
32	16						26	392		24	24	
Total	523.0	427.0	372	279	336	772	9111	18204	5279	1089	1199	1343
Mean	16.9	14.2	12	9	12	24.9	304	587	176	35.1	38.7	44.8
Ac-ft	1,040	847	738	553	666	1,530	18,070	36,110	10,470	2,160	2,380	2,660

Calendar year 1960: Max 821 Min 7.0 Mean 106 Ac-ft 76,760  
Water year 1960-61: Max 1,050 Min - Mean 107 Ac-ft 77,220

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-22	8:30p.m.	5.01	936	5-11	10p.m.	5.32	1,130
5-2	10p.m.	5.86	1,420				

Note.--Stage-discharge relation affected by ice Nov. 17 to Dec. 5. No gage-height record Dec. 6 to Mar. 27 (stage-discharge relation affected by ice during most of periods).



## RIO GRANDE BASIN

8-2485. San Antonio River at mouth, near Manassa, Colo.

Location.--Lat 37°11', long 105°53', in sec.21, T.34 N., R.10 E., on right bank a quarter of a mile downstream from bridge on State Highway 142 (relocated), 1 mile upstream from mouth, and  $\frac{3}{2}$  miles east of Manassa.

Drainage area.--348 sq mi.

Records available.--April 1923 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 7,680 ft (estimated from nearby U. S. Coast and Geodetic Survey level line). Prior to Apr. 23, 1936, at former bridge site 200 ft upstream at same datum.

Average discharge.--38 years, 85.2 cfs (61,680 acre-ft per year).

Extremes.--Maximum discharge during year, 1,090 cfs May 3 (gage height, 5.81 ft); no flow for many days.

1923-61: Maximum discharge, 2,620 cfs May 14, 1941, from rating curve extended above 2,200 cfs; maximum gage height, 6.42 ft

May 6, 1952; no flow at times in most years.

Maximum stage known since at least 1854 occurred Oct. 5, 1911, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by diversions to Cave Lake Reservoir (capacity, 9,700 acre-ft) and diversions for irrigation above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Jan. 1 to Sept. 30

0.3	0	1.1	14
.5	.8	1.4	41
.6	1.3	2.0	120
.7	2.0	3.0	290
.8	3.1	4.0	520
.9	5.1	5.0	810
1.0	8.5	5.9	1,120

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0		4.6	859	198	18	0	0.5
2					0		4.6	943	182	16	0	1
3					1.1		7.2	999	*164	19	*.4	0
4					b 2		50	926	140	16	1.4	.6
5	(*)				2		*180	768	130	13	1.2	1.3
6					3	8	99	554	112	10	.7	1.3
7			(*)		3		88	398	99	13	.2	*1.9
8					3		61	306	91	20	0	4.4
9					4		41	270	82	20	0	4.6
10					5		39	323	73	21	0	3.0
11					6		37	430	75	20	0	2.7
12					b 7		29	556	81	20	0	3.6
13					b 7	(*)	40	549	65	20	0	3.1
14					*8	b 8	57	398	57	17	0	2.8
15						8.0	44	*321	72	16	.3	1.8
16						10	28	290	103	13	2.1	1.4
17						9.6	61	286	116	11	1.7	1.2
18		(*)				7.2	138	294	114	*7.6	3.0	1.2
19						6.2	203	314	110	5.4	3.3	4.2
20						7.2	476	332	95	3.6	1.6	28
21					8	8.0	502	308	74	2.8	1.2	28
22						8.5	497	298	55	2.7	.6	33
23				(*)		16	580	308	*42	2.1	*.1	28
24						35	595	341	41	1.7	1.2	21
25						49	*416	280	45	1.3	4.9	16
26						26	334	258	43	1.2	2.0	12
27	(*)					*13	290	270	35	1.1	4.9	7.2
28			(*)			9.6	339	268	29	.9	5.1	5.4
29						9.0	502	264	28	.7	2.2	4.4
30						7.6	698	241	25	.5	1.2	3.3
31						5.9	-----	214	-----	1	.8	-----
Total	0	0	0	0	163.1	347.8	6440.4	13166	2576	314.7	50.9	226.0
Mean	0	0	0	0	5.82	11.2	215	425	85.9	10.2	1.64	7.53
Ac-ft	0	0	0	0	324	690	12,770	26,110	5,110	624	101	448

Calendar year 1960: Max 769

Min 0

Mean 63.0

Ac-ft 45,760

Water year 1960-61: Max 999

Min 0

Mean 63.8

Ac-ft 46,180

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-23	10a.m.	4.61	683	5-12	10a.m.	4.46	641
5-3	1p.m.	5.81	1,090				

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Feb. 5-11, Feb. 14 to Mar. 13 (stage-discharge relation affected by ice during most of periods).

8-2490. Conejos River near La Sauses, Colo.

Location.--Lat 37°18', long 105°45', in secs. 2 and 11 (two channels), T.35 N., R.11 E., on left bank of main channel 125 ft downstream from bridge on State Highway 158 and on right bank of secondary channel 50 ft downstream from bridge on State Highway 158, half a mile upstream from mouth, 1.8 miles north of La Sauses, and 13 miles southeast of Alamosa.

Drainage area.--887 sq mi.

Records available.--March 1921 to September 1961. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Two water-stage recorders. Datum of gage on main (north) channel is 7,495.02 ft, and on secondary (south) channel is 7,495.89 ft, above mean sea level (levels by Bureau of Reclamation). Main channel: Prior to Oct. 23, 1934, at bridge 125 ft upstream at various datums; Oct. 23, 1934, to Apr. 10, 1937, at site 50 ft upstream, and Apr. 11 to Sept. 30, 1937, at present site, at datum 1.00 ft higher. South channel: Prior to Oct. 23, 1934, at bridge 50 ft upstream at datum 0.44 ft higher. Oct. 23, 1934, to May 3, 1936, at site 30 ft upstream at present datum.

Average discharge.--40 years, 197 cfs (142,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,320 cfs May 4; no flow Aug. 1, 7-16, 26-31.

1921-61: Maximum discharge, 3,890 cfs May 15, 1941; no flow at times in 1934, 1948, 1950-51, 1953-61.  
Maximum stage known since at least 1854 occurred Oct. 5, 1911, from information by local residents.

Remarks.--Records good. Discharge measurements or observations of no flow made at least twice a month. Diversions for irrigation of about 75,000 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	1.1	2.3	3.4	4.3	5.4	4.9	7.23	5.86	3.0	0	0.4
2	2.3	1.2	2.9	3.4	4.8	5.4	4.4	9.21	5.31	3.1	.2	1.5
3	1.7	1.4	3.6	3.3	5.0	5.8	4.6	1.060	3.87	2.5	.5	4.3
4	1.9	1.5	3.6	3.3	5.3	6.3	4.8	1.150	2.43	2.4	.2	3.9
5	1.6	1.6	3.5	3.3	5.1	6.7	1.21	1.130	1.94	3.0	.1	3.7
6	1.7	1.3	3.3	3.4	4.9	5.6	1.66	6.23	1.58	9.2	.1	1.9
7	2.0	1.3	3.1	3.5	4.8	5.3	1.30	3.20	1.11	7.7	0	1.2
8	2.0	2.0	2.9	3.5	5.1	5.2	1.21	2.53	7.0	7.8	0	1.1
9	2.1	1.65	3.2	3.6	5.0	5.7	9.1	2.16	4.9	7.6	0	2.4
10	2.7	4.63	3.4	3.6	5.3	5.5	7.4	2.72	3.2	7.4	0	3.2
11	3.1	5.34	3.4	3.8	6.0	5.8	7.3	3.03	2.4	6.8	0	3.7
12	4.4	5.54	3.6	3.8	6.0	6.6	6.6	3.58	1.4	6.2	0	3.7
13	4.6	5.47	3.4	3.9	6.4	5.8	5.8	4.23	6.3	5.5	0	3.0
14	1.8	5.39	3.4	3.9	6.9	4.4	7.5	3.26	4.8	5.0	0	2.9
15	2.4	3.73	3.1	4.0	7.4	4.4	8.4	2.54	3.3	4.5	0	3.2
16	3.3	1.25	3.0	4.0	7.7	4.5	7.3	2.21	8.8	3.2	0	2.9
17	3.8	8.2	3.0	4.0	7.2	6.0	6.3	2.09	2.2	2.2	.2	1.1
18	2.9	6.3	2.9	3.9	6.5	6.1	1.49	2.10	3.6	1.8	.2	.7
19	1.3	4.6	2.9	4.1	6.6	4.8	3.21	2.06	2.7	1.8	.2	1.9
20	1.0	4.0	3.2	4.1	6.3	4.7	6.42	2.32	2.2	1.9	.1	2.1
21	1.4	3.9	3.2	4.0	5.7	4.6	7.83	2.54	1.5	2.2	.1	7.2
22	6.5	3.6	3.4	4.0	5.5	4.5	5.86	2.63	1.0	2.1	.1	1.7
23	9.5	3.4	3.4	3.8	6.2	4.7	5.75	4.74	7.7	1.4	.3	1.8
24	8.4	3.4	3.4	4.0	5.5	5.1	6.15	8.02	7.3	.7	.2	3.8
25	6.1	3.2	3.9	4.3	5.4	8.1	4.15	4.17	1.1	.8	.1	2.6
26	7.2	2.9	3.9	4.3	6.1	9.0	2.62	4.72	2.0	.3	0	2.2
27	7.9	2.3	3.9	4.6	5.8	6.8	2.06	6.32	1.8	.2	0	1.9
28	7.9	2.8	4.0	4.7	5.6	5.3	1.99	8.99	8.0	.1	0	1.4
29	6.3	2.6	3.8	4.4	-	5.6	2.98	9.39	3.3	.1	0	1.1
30	7.2	2.9	3.8	4.4	-----	5.3	4.88	7.15	3.3	.3	0	8.9
31	1.0	-----	3.6	4.6	-----	5.2	-----	6.71	-----	.3	0	-----
Total	123.4	3.975	1.045	1.209	1.629	1.736	6.921	15.953	2.637.8	101.1	2.6	229.9
Mean	4.14	132	33.7	39.0	58.2	56.0	231	515	87.9	3.26	0.08	7.66
Ac-ft	255	7,880	2,070	2,400	3,230	3,440	13,730	31,640	5,230	201	5.2	456

Calendar year 1960: Max 1,170 Min 0 Mean 128 Ac-ft 93,020  
Water year 1960-61: Max 1,150 Min 0 Mean 97.4 Ac-ft 70,540

Note.--Stage-discharge relation affected by ice on main channel Dec. 6, 7, 18, 21, 22, Dec. 30 to Jan. 14, and on secondary channel Nov. 16, 28, 29, Dec. 5-8, 10, 11, Dec. 15 to Jan. 27.

## RIO GRANDE BASIN

8-2500. Culebra Creek at San Luis, Colo.

Location.--Lat 37°11', long 105°26', in Beaubien Grant, at bridge on left bank, 1 mile south of San Luis, Costilla County, and 1 mile upstream from Rito Seco.

Drainage area.--220 sq mi.

Records available.--April 1927 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Records for January 1910 to December 1911, published as "Culebra River" in WSP 288 and 308, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,000 ft (from topographic map). Prior to May 23, 1931, water-stage recorder at present site at different datum.

Average discharge.--34 years, 52.2 cfs (37,790 acre-ft per year).

Extremes.--Maximum discharge during year, 254 cfs Aug. 2 (gage height, 2.70 ft); minimum daily, 8.5 cfs Oct. 7-12.  
1927-61: Maximum discharge, 654 cfs July 1, 1947 (gage height, 5.09 ft), from rating curve extended above 300 cfs; minimum daily, 4.6 cfs Oct. 31, 1950.

Remarks.--Records good. Diversions above station for irrigation. Flow regulated by Sanchez Reservoir on Ventero Creek (capacity, 103,000 acre-ft).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	8.0
.5	24
1.0	59
1.5	107
2.0	165

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	9.0	12	10	14	14	18	13	63	78	116	35
2	9.0	9.0	12	10	14	15	19	12	112	32	129	31
3	*9.0	9.0	12	10	15	15	18	13	105	31	74	47
4	9.5	9.0	10	10	14	15	16	*26	111	26	30	35
5	9.5	9.0	12	11	14	15	17	26	112	34	28	29
6	9.0	10	12	11	13	14	18	16	119	61	27	24
7	8.5	11	*12	12	13	14	18	14	149	72	20	23
8	8.5	11	12	12	13	14	18	16	*164	65	24	22
9	8.5	12	12	12	14	14	18	14	148	38	28	22
10	8.5	12	10	12	14	16	*17	13	154	35	48	21
11	8.5	10	12	12	14	16	16	14	153	45	78	20
12	8.5	10	12	12	15	16	16	14	155	48	79	20
13	9.5	10	12	12	15	*16	15	16	164	48	81	20
14	9.5	10	12	12	*16	16	15	17	140	74	81	38
15	9.5	10	11	12	16	16	15	31	103	73	82	47
16	14	*9.5	12	12	16	16	15	28	74	72	82	53
17	17	9.5	12	12	16	16	14	19	75	76	*79	52
18	14	9.5	11	12	16	16	14	36	73	105	53	52
19	12	9.5	12	12	16	16	14	58	72	133	49	34
20	10	9.5	11	12	14	15	14	72	74	134	46	20
21	10	10	12	12	15	14	13	88	102	128	46	*30
22	10	10	12	12	16	14	13	48	116	79	45	26
23	10	9.5	11	*12	16	14	12	*50	124	27	45	21
24	*10	9.5	11	12	16	14	12	49	135	47	45	25
25	10	10	10	12	16	14	14	81	130	*54	45	24
26	10	10	10	13	17	14	14	114	127	97	45	20
27	10	9.0	10	14	16	14	14	64	106	120	40	19
28	10	10	*10	12	14	14	14	112	99	118	32	18
29	9.5	12	10	14	-	15	13	88	97	118	28	18
30	9.5	12	10	14	-----	15	14	72	*94	118	29	20
31	9.5	-----	10	14	-----	15	-----	59	-----	117	42	-----
Total	310.0	300.5	349	371	418	465	458	1293	3450	2303	1676	866
Mean	10.0	10.0	11.3	12.0	14.9	15.0	15.3	41.7	115	74.3	54.1	28.9
Ac-ft	615	596	692	736	829	922	908	2,560	6,840	4,570	3,320	1,720
Calendar year 1960:	Max 177		Min 8.0		Mean 38.5		Ac-ft 27,980					
Water year 1960-61:	Max 164		Min 8.5		Mean 33.6		Ac-ft 24,310					

\* Discharge measurement made on this day.

8-2515. Rio Grande near Lobatos, Colo.

Location---Lat 37°05', long 105°45', in sec.22, T.33 N., R.11 E., on right bank at highway bridge, 6 miles north of Colorado-New Mexico State line, 7 miles downstream from Culebra Creek, 10 miles east of Lobatos, and 14 miles east of Antonito.

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

Records available---June 1899 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Published as "at Cenicero" 1899-1901, and as "near Cenicero" 1902-4.

Gage---Water-stage recorder. Datum of gage is 7,427.63 ft above mean sea level, datum of 1929. Prior to Nov. 8, 1910, staff or chain gage at same site and datum.

Average discharge---62 years, 636 cfs (460,400 acre-ft per year).

Extremes---Maximum discharge during year, 1,440 cfs May 2 (gage height, 3.06 ft); minimum daily, 29 cfs Oct. 6, 8.  
1899-1961: Maximum discharge observed, 13,200 cfs June 8, 1905 (gage height, 9.1 ft), from rating curve extended above 8,000 cfs; no flow at times in 1950-51, 1956.  
Maximum stage known, probably since at least 1828, occurred June 8, 1905.

Remarks---Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month during winter and three times a month the rest of year. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals and diversions for irrigation, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 2-6, May 29 to July 1)

0.6	26	2.0	554
.8	58	2.5	940
1.1	134	3.0	1,510
1.5	284		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	76	144	170	180	200	160	688	854	76	33	30
2	30	73	145	165	175	250	177	1,090	811	69	37	34
3	32	78	125	155	175	250	166	1,080	753	67	53	58
4	30	76	140	130	185	240	160	1,160	567	69	65	90
5	32	73	140	140	195	230	177	1,230	418	62	51	92
6	29	73	85	135	195	230	280	940	358	60	54	88
7	32	65	100	140	190	225	276	612	313	73	54	82
8	29	67	117	135	190	220	276	485	251	67	49	90
9	36	71	116	140	190	225	272	418	211	62	49	144
10	37	289	116	140	195	230	247	395	243	58	44	95
11	36	542	134	134	200	231	219	429	239	56	40	80
12	34	586	156	135	210	231	211	429	211	56	39	71
13	33	599	173	135	220	235	203	502	177	58	44	82
14	36	605	177	145	230	211	192	485	163	54	67	95
15	36	586	170	160	245	196	192	353	140	53	69	88
16	37	280	181	155	250	192	192	318	114	51	67	80
17	60	166	177	150	270	199	173	284	105	49	67	73
18	65	120	160	146	270	203	156	268	111	45	69	65
19	111	105	160	150	260	166	284	251	134	42	65	78
20	150	102	160	150	260	170	513	259	134	53	56	76
21	160	98	163	150	260	166	854	313	144	76	45	73
22	134	98	163	150	260	160	710	318	160	80	45	80
23	122	98	166	151	260	160	667	384	153	60	73	122
24	108	98	166	155	240	160	731	777	156	53	51	114
25	98	98	166	160	245	163	717	639	134	40	47	105
26	88	100	170	170	220	181	525	554	122	39	45	92
27	85	111	170	170	180	170	446	667	114	95	39	90
28	85	147	170	180	185	160	379	874	105	69	33	85
29	82	147	173	190	-	153	384	1,070	95	54	37	80
30	80	137	173	165	-----	160	525	864	90	42	36	73
31	73	-----	173	170	-----	153	-----	820	-----	40	33	-----
Total	2,030	5,764	4,729	4,721	6,135	6,120	10,464	18,956	7,580	18,288	15,556	25,055
Mean	65.5	192	153	152	219	197	349	611	253	59.0	50.2	83.5
Ac-ft	4,030	11,430	9,380	9,360	12,170	12,140	20,760	37,600	15,030	3,630	3,090	4,970

Calendar year 1960: Max 1,750 Min 13 Mean 277 Ac-ft 201,000  
Water year 1960-61: Max 1,230 Min 29 Mean 198 Ac-ft 143,600

Note---Stage-discharge relation affected by ice Nov. 18-25, Nov. 28 to Mar. 10.



## RIO GRANDE BASIN

8-2520. Rio Grande at Colorado-New Mexico State line

Location.--Lat 37°00', long 105°43', in SE¼ sec.36, T.1 N., R.75 W., in Beaubien Grant, on left bank a quarter of a mile upstream from Colorado-New Mexico State line, 1½ miles upstream from Costilla Creek, and 5¼ miles west of Jaroso.

Records available.--October 1953 to September 1961.

Gage.--Water-stage recorder.

Average discharge.--8 years, 247 cfs (178,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs May 2 (gage height, 4.50 ft); minimum daily, 25 cfs Sept. 2.

1953-61: Maximum discharge, 4,150 cfs May 29, 1958 (gage height, 7.07 ft); no flow at times in 1956.

Flood of June 8, 1905 (daily discharge, 13,100 cfs at station near Lobatos 5.8 miles upstream) was probably the greatest since at least 1828.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals and diversions for irrigation, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-22, June 19-30)

1.1	16	3.0	555
1.2	27	4.0	1,040
1.4	61	5.0	1,790
2.0	222		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	72	93		(*)	200	163	694	855	83	28	26
2	28	70	93			220	180	1,040	*820	70	27	25
3	30	68	122			240	172	1,120	785	65	*32	36
4	30	72	138			230	*160	1,190	627	68	48	81
5	*32	72	124			225	172	1,260	473	63	42	79
6	30	72	79			220	255	1,070	404	59	39	79
7	30	70	93			220	289	694	352	70	44	*74
8	28	72	110			215	292	539	289	68	44	74
9	30	74	110			220	283	462	225	63	40	122
10	42	216	110			230	258	425	246	55	38	100
11	39	519	120	(*)		250	237	438	258	52	36	76
12	39	*579	140			250	219	431	249	50	36	65
13	36	591	150			240	204	490	219	50	34	68
14	39	595	170			234	192	508	210	48	50	79
15	48	591	180			213	192	*398	198	46	63	79
16	46	372	*190	155	220	210	198	336	163	44	63	70
17	61	169	180			213	186	324	138	40	63	65
18	76	132	175			*216	155	283	141	39	98	57
19	98	119	170			186	234	268	166	*36	63	68
20	138	113	170			186	435	258	163	36	59	65
21	157	108	175		(*)	180	795	311	166	59	44	63
22	141	103	175			172	716	333	*175	81	39	65
23	127	93	180			172	640	372	175	65	*63	103
24	113	81	180			166	694	694	183	52	50	119
25	106	100	180			163	720	712	163	46	44	111
26	93	100	180			183	563	555	138	39	42	93
27	*90	98	180			180	470	648	130	79	40	90
28	81	*119	180			166	408	820	113	74	32	81
29	76	103	180			166	401	992	103	63	32	76
30	76	83	180			169	504	880	90	40	32	63
31	70	-----	180			160	-----	820	-----	36	30	-----
Total	2,058	5,626	4,687	4,805	6,160	6,295	10,387	19,365	8,417	1,739	1,395	2,252
Mean	66.4	188	151	155	220	203	346	625	281	56.1	45.0	75.1
Ac-ft	4,080	11,160	9,300	9,530	12,220	12,490	20,600	38,410	16,690	3,450	2,770	4,470

Calendar year 1960: Max 1,590 Min 11 Mean 269 Ac-ft 195,100  
Water year 1960-61: Max 1,260 Min 25 Mean 201 Ac-ft 145,200

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 23, 24, 28, Dec. 8 to Mar. 13 (no gage-height record Jan. 15 to Feb. 1).

9-105. Colorado River below Baker Gulch, near Grand Lake, Colo.

Location.--Lat 40°19'33", long 105°51'22", in sec.12, T.4 N., R.76 W., on left bank 500 ft downstream from Baker Gulch, 1 mile upstream from Bowen Gulch, and 5 miles northwest of town of Grand Lake.

Drainage area.--53.0 sq mi.

Records available.--May 1953 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,750 ft (from topographic map).

Average discharge.--8 years, 52.3 cfs (37,860 acre-ft per year).

Extremes.--Maximum discharge during year, 578 cfs June 20 (gage height, 6.09 ft); minimum not determined.

1953-61: Maximum discharge, 976 cfs June 30, 1957 (gage height, 7.19 ft); minimum daily, 3.6 cfs Jan. 19, 1957.

Remarks.--Records good except those for periods of ice effect or backwater from beaver dam, which are poor. Transmountain diversion above station by Grand River ditch (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect  
or backwater from beaver dam  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-30, Apr. 23-25, Apr. 27 to May 4)

3.3	9.5	4.0	76
3.5	21	5.0	250
3.7	40	6.0	530

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	17					8.0	75	434	130	55	27
2	19	16					8.2	104	416	108	39	24
3	19	16					8.8	110	359	95	33	32
4	18	16					8.8	*91	303	92	27	35
5	17	16			(*)		9.2	73	260	92	26	61
6	17	15					8.5	59	260	80	25	75
7	18	14					8.0	48	260	77	26	82
8	18	13			(*)		8.0	47	*324	72	24	92
9	18	12				7	9.0	67	407	63	24	106
10	20	14					9.0	108	473	62	22	108
11	20	14					9.0	138	476	61	25	95
12	20	13					8.2	163	488	*57	28	86
13	20	13				(*)	*7.4	136	476	50	32	*79
14	19	13					7.4	102	467	49	28	72
15	19	12					7.8	89	437	53	*25	66
16	19	13					8.4	88	434	43	28	62
17	*21	13					9.2	*97	*446	40	64	62
18	20	*13					10	102	455	37	40	63
19	18	13					15	120	449	34	31	79
20	18	12					15	154	530	34	27	84
21	19	13					17	182	491	58	31	86
22	20	13					22	192	470	51	26	89
23	21	13					26	225	437	39	21	82
24	21	13				8	25	216	332	34	20	73
25	21	12					27	210	182	32	24	68
26	20	12					27	236	165	31	27	77
27	20	12					26	243	151	31	23	82
28	22	11					28	269	135	31	19	95
29	19	10					34	324	124	30	19	126
30	16	11					50	425	128	28	21	96
31	17							455		51	28	
Total	594	393	310	248	196	233	465.0	4,943	10,769	1,745	883	2,264
Mean	19.2	13.3	10	8	7	7.5	15.5	160	359	56.3	28.6	75.5
Ac-ft	1,180	789	615	492	389	462	922	9,810	21,360	3,460	1,760	4,490

Calendar year 1960: Max 327 Min 6 Mean 51.1 Ac-ft 37,090  
 Water year 1960-61: Max 530 Min - Mean 63.2 Ac-ft 45,730

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31 to Apr. 23 (no gage-height record Feb. 24 to Mar. 13), Apr. 26. Backwater from beaver dam Oct. 1-30, Apr. 23-25, Apr. 27 to May 4.

## 8-2515. Rio Grande near Lobatos, Colo.

Location.--Lat 37°05', long 105°45', in sec.22, T.33 N., R.11 E., on right bank at highway bridge, 6 miles north of Colorado-New Mexico State line, 7 miles downstream from Culebra Creek, 10 miles east of Lobatos, and 14 miles east of Antonito.

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

Records available.--June 1899 to September 1961. Monthly discharge only for some periods, published in WSP 1312. Published as "at Cenicero" 1899-1901, and as "near Cenicero" 1902-4.

Gage.--Water-stage recorder. Datum of gage is 7,427.63 ft above mean sea level, datum of 1929. Prior to Nov. 8, 1910, staff or chain gage at same site and datum.

Average discharge.--62 years, 636 cfs (460,400 acre-ft per year).

Extremes.--Maximum discharge during year, 1,440 cfs May 2 (gage height, 3.06 ft); minimum daily, 29 cfs Oct. 6, 8.

1899-1961: Maximum discharge observed, 13,200 cfs June 8, 1905 (gage height, 9.1 ft), from rating curve extended above 8,000 cfs; no flow at times in 1950-51, 1956.

Maximum stage known, probably since at least 1828, occurred June 8, 1905.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month during winter and three times a month the rest of year. Natural flow of stream affected by transmountain diversions, storage reservoirs, ground-water withdrawals and diversions for irrigation, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 2-6, May 29 to July 1)

0.6	26	2.0	554
.8	58	2.5	940
1.1	134	3.0	1,510
1.5	284		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	76	144	170	180	200	160	688	854	76	33	30
2	30	73	145	165	175	250	177	1,090	811	69	37	34
3	32	78	125	155	175	250	166	1,080	753	67	53	58
4	30	76	140	130	185	240	160	1,160	567	69	65	90
5	32	73	140	140	195	230	177	1,230	418	62	51	92
6	29	73	85	135	195	230	280	940	358	60	54	88
7	32	65	100	140	190	225	276	612	313	73	54	82
8	29	67	117	135	190	220	276	485	251	67	49	90
9	36	71	116	140	190	225	272	418	211	62	49	144
10	37	289	116	140	195	230	247	395	243	58	44	95
11	36	542	134	134	200	231	219	429	239	56	40	80
12	34	586	156	135	210	231	211	429	211	56	39	71
13	33	599	173	135	220	235	203	502	177	58	44	82
14	36	605	177	145	230	211	192	485	163	54	67	95
15	36	586	170	160	245	196	192	353	140	53	69	88
16	37	280	181	155	250	192	192	318	114	51	67	80
17	60	166	177	150	270	199	173	284	105	49	67	73
18	65	120	160	146	270	203	156	268	111	45	69	65
19	111	105	160	150	260	166	284	251	134	42	65	78
20	150	102	160	150	260	170	513	259	134	53	56	76
21	160	98	163	150	260	166	854	313	144	76	45	73
22	134	98	163	150	260	160	710	318	160	80	45	80
23	122	98	166	151	260	160	667	384	153	60	73	122
24	108	98	166	155	240	160	731	777	156	53	51	114
25	98	98	166	160	245	163	717	639	134	40	47	105
26	88	100	170	170	220	181	525	554	122	39	45	92
27	85	111	170	170	180	170	446	667	114	95	39	90
28	85	147	170	180	185	160	379	874	105	69	33	85
29	82	147	173	190	-	153	384	1,070	95	54	37	80
30	80	137	173	165	-----	160	525	864	90	42	36	73
31	73	-----	173	170	-----	153	-----	820	-----	40	33	-----
Total	2,030	5,764	4,729	4,721	6,135	6,120	10,464	18,956	7,580	1,828	1,556	2,505
Mean	65.3	192	153	152	219	197	349	611	253	59.0	50.2	83.5
Ac-ft	4,030	11,430	9,380	9,360	12,170	12,140	20,760	37,600	15,030	3,630	3,090	4,970

Calendar year 1960: Max 1,750 Min 13 Mean 277 Ac-ft 201,000  
Water year 1960-61: Max 1,230 Min 29 Mean 198 Ac-ft 143,600

Note.--Stage-discharge relation affected by ice Nov. 18-25, Nov. 28 to Mar. 10.

## COLORADO RIVER MAIN STEM

9-110. Colorado River near Grand Lake, Colo.

Location.--Lat 40°13'08", long 105°51'25", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.13, T.3 N., R.76 W., on left bank 200 ft downstream from bridge on U. S. Highway 34, 400 ft upstream from high-water line of Shadow Mountain Lake at elevation 8,367 ft, and 3 miles southwest of town of Grand Lake.

Drainage area.--103 sq mi.

Records available.--July 1904 to September 1918, October 1933 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "Grand River (North Fork)" 1904 and as "North Fork of Grand River" 1905-18.

Gage.--Water-stage recorder. Altitude of gage is 8,380 ft (from topographic map). Prior to June 15, 1934, staff gage at same site and datum. June 15, 1934, to Sept. 26, 1944, water-stage recorder at site 1,100 ft downstream at different datum.

Average discharge.--42 years, 95.9 cfs (69,430 acre-ft per year).

Extremes.--Maximum discharge during year, 617 cfs June 20 (gage height, 5.67 ft); minimum daily, 3.5 cfs July 19. 1904-18, 1933-61: Maximum discharge observed, 1,840 cfs June 15, 16, 1918 (gage height, 7.0 ft), from rating curve extended above 1.100 cfs; minimum daily, 1.7 cfs July 18, 19, 1934.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation of about 200 acres of hay meadows above station and about 2,000 acres below. Transmountain diversion above station by Grand River ditch through La Poudre Pass to Cache la Poudre River basin (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.0	3.0	3.4	18	4.5	170
3.1	3.5	3.6	32	5.0	315
3.2	8.5	3.9	68	5.5	520
3.3	12	4.2	116	5.9	760

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	22	b17	14	15	15	13	105	515	136	110	48
2	28	20	b17	13	13	17	14	145	526	100	74	41
3	27	22	17	13	13	17	15	188	466	79	57	53
4	26	25	b17	13	13	14	15	162	405	68	48	60
5	25	24	b16	*13	13	14	b16	124	343	78	43	87
6	25	22	b16	13	12	15	b15	*92	329	60	40	121
7	25	23	b16	13	13	14	b14	82	301	50	41	129
8	25	23	b16	15	*14	14	b14	73	*357	48	38	136
9	25	21	b15	16	15	15	b15	100	443	38	39	150
10	27	b25	14	15	16	15	16	145	505	34	33	152
11	29	b24	15	15	18	13	16	180	526	32	33	132
12	28	b24	b13	15	17	*13	15	210	548	*32	39	122
13	27	23	b12	13	16	12	*14	195	526	26	50	*111
14	30	22	b12	13	17	b12	b14	136	495	22	47	103
15	31	19	b12	13	17	11	b14	127	475	14	*40	95
16	30	b19	b12	13	17	11	15	129	470	5.0	37	89
17	*32	b20	10	15	15	11	16	*129	*480	4.5	98	89
18	32	b20	11	14	13	11	18	146	495	3.8	71	87
19	30	b20	12	13	13	b11	22	146	485	3.5	50	113
20	29	b19	12	12	13	11	26	*198	564	4.5	41	130
21	28	b19	13	13	14	12	b30	235	548	7.0	48	137
22	27	20	14	13	13	b13	b36	244	505	10	42	160
23	26	b21	14	15	13	b13	b35	290	475	4.8	35	141
24	26	*b23	b15	15	13	12	32	290	425	4.5	32	129
25	27	b25	b15	15	14	12	30	271	241	25	35	114
26	24	b25	15	14	13	12	35	312	172	47	41	136
27	23	b20	b14	13	12	12	32	318	137	47	39	148
28	23	b18	b14	12	13	12	36	346	126	48	32	164
29	24	b15	b13	13	-	b12	52	393	111	48	30	247
30	22	b16	b14	14	-----	b13	74	480	111	52	33	188
31	22	-----	15	15	-----	b13	-----	526	-----	73	47	-----
Total	833	639	438	426	398	402	710	6,522	12,105	1,204.6	1,443	3,612
Mean	26.9	21.3	14.1	13.7	14.2	13.0	23.7	210	404	38.9	46.5	120
Ac-ft	1,650	1,270	869	845	789	797	1,410	12,940	24,010	2,390	2,860	7,160

Calendar year 1960: Max 515 Min 3.2 Mean 79.3 Ac-ft 57,550  
 Water year 1960-61: Max 564 Min 3.5 Mean 78.7 Ac-ft 56,990

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 5 to Mar. 12 (stage-discharge relation affected by ice during parts of period).



## GRAND LAKE OUTLET BASIN

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9-130. Alva B. Adams tunnel at east portal, near Estes Park, Colo.

Location.--Lat 40°19'40", long 105°34'39", in SW¼NW¼ sec.9, T.4 N., R.73 W., on right bank at upstream end of Aspen Creek siphon, 700 ft downstream from east portal and 4½ miles southwest of Estes Park.

Records available.--October 1946 to September 1961. Monthly discharge only for August and September 1947.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,250 ft (from topographic map). Prior to Oct. 1, 1950, water-stage recorder and Parshall flume at different datum. Oct. 1, 1950, to Sept. 30, 1952, water-stage recorder and Cippoletti weir at different datum.

Average discharge.--15 years, 207 cfs (149,900 acre-ft per year).

Extremes.--Maximum discharge during year, 581 cfs Feb. 6 (gage height, 4.23 ft); no flow for many days.

1946-61: Maximum discharge, 614 cfs July 8, 1953 (gage height, 4.38 ft); no flow at times in most years.

Remarks.--Records excellent. This is a transmountain diversion from Grand Lake and Shadow Mountain Lake for power and irrigation development in the South Platte River basin as part of the Colorado-Big Thompson project. Diversion point is at west portal near town of Grand Lake, 13.35 miles west of east portal.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.0	0	0.7	33
.1	2.0	1.0	58
.2	5.0	2.0	175
.3	8.4	3.0	335
.5	19	5.0	759

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	375	504	430	171	473	457	217	377		0	208	272
2	350	533	404	255	419	459	82	385		0	195	88
3	429	505	303	352	441	433	241	369		0	157	0
4	363	508	262	388	262	302	203	490		0	272	0
5	457	362	432	463	243	290	197	432		0	107	193
6	413	378	458	457	417	443	172	337		166	0	152
7	396	518	460	291	437	437	118	237		156	324	143
8	305	514	461	303	461	433	229	444		0	299	160
9	310	516	461	413	403	473	229	433		0	328	103
10	469	472	308	429	514	459	353	421		156	316	63
11	481	395	272	328	310	410	268	421		192	290	215
12	483	365	463	*429	200	294	147	442		176	156	204
13	485	294	461	412	471	487	156	276		94	32	214
14	496	500	461	323	494	473	142	7.0		226	242	*204
15	326	457	455	299	510	473	289	333		91	221	208
16	373	404	410	437	508	502	347	376		0	272	100
17	481	402	340	412	485	550	363	96		244	*259	1.1
18	508	447	265	410	311	417	357	290		*289	302	257
19	506	357	463	433	242	295	450	249		274	2.3	216
20	508	306	455	425	477	419	403	107		307	0	179
21	451	417	459	322	491	463	353	5.7		233	253	166
22	315	423	410	278	282	412	309	275		57	222	137
23	295	453	469	445	457	389	162	146		71	320	63
24	497	274	410	473	496	374	345	146		299	283	0
25	489	457	280	463	363	349	370	4.7		329	310	137
26	469	373	242	465	291	337	396	112		259	2.0	184
27	*459	255	412	465	485	408	362	87		266	0	192
28	455	479	415	313	459	416	389	0		271	293	182
29	355	481	413	265	-	382	261	0		254	387	199
30	355	453	412	477	-----	374	167	0		61	313	1.0
31	453	-----	307	471	-----	391	-----	0	-----	283	302	-----
Total	13,108	12,802	12,253	11,867	11,402	12,801	8,076	7,299.4	0	4,754	6,639.5	4,233.1
Mean	423	427	395	383	407	413	269	235	0	153	214	141
Ac-ft	26,000	25,390	24,300	23,540	22,620	25,390	16,020	14,480	0	9,430	13,170	8,400

Calendar year 1960: Max 561 Min 0 Mean 335 Ac-ft 242,900  
 Water year 1960-61: Max 550 Min 0 Mean 288 Ac-ft 208,700

\* Discharge measurement made on this day.

## COLORADO RIVER MAIN STEM

9-145. Shadow Mountain Lake near Grand Lake, Colo.  
(Formerly published as Shadow Mountain Reservoir near Grand Lake)

Location.--Lat 40°12'30", long 105°50'20", in SW $\frac{1}{4}$  NW $\frac{1}{4}$  sec.19, T.3 N., R.75 W., in gatehouse on left side of outlet gates near center of Shadow Mountain Dam on the Colorado River, 1 mile upstream from Pole Creek and  $3\frac{1}{4}$  miles south of town of Grand Lake.

Drainage area.--190 sq mi.

Records available.--April 1947 to September 1961. Prior to October 1960, published as Shadow Mountain Reservoir near Grand Lake.

Gage.--Water-stage recorder for elevations above 8,364.0 ft and reference points along upstream face of dam for those below. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Supplementary water-stage recorder at Grand Lake outlet gates about 3 miles from dam.

Extremes.--Maximum contents during year, 17,830 acre-ft Sept. 7 (elevation, 8,366.98 ft); minimum, 16,340 acre-ft June 9, 10 (elevation, 8,366.17 ft).

1947-61: Maximum contents, 17,920 acre-ft May 22, 1955 (elevation, 8,367.03 ft); minimum since appreciable storage was first attained, 2,630 acre-ft May 14, 1948.

Remarks.--Figures given herein are combined figures of usable contents for Shadow Mountain Lake and Grand Lake. Shadow Mountain Lake is used for stabilization of water level in Grand Lake, from which it is separated by gates. Shadow Mountain Lake is formed by earth- and rock-fill dam and dikes. Storage began in April 1947. Capacity of Shadow Mountain Lake, 17,860 acre-ft (including usable capacity of Grand Lake above elevation 8,365 ft) between elevations 8,347 (sill of outlet gate) and 8,367 ft (maximum water surface). Dead storage in Shadow Mountain Lake, 506 acre-ft. Dead storage in Grand Lake not determined. Capacity of Shadow Mountain Lake and Grand Lake usable for diversion through Alva B. Adams tunnel, 3,660 acre-ft between elevations 8,365 (crest of tunnel inlet) and 8,367 ft (maximum water surface). Transmountain diversion from Colorado River basin, including water pumped from Lake Granby is effected through Grand Lake and Alva B. Adams tunnel, for power and irrigation in South Platte River basin.

Cooperation.--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	8,366.65	17,220	-
Oct. 31.....	8,366.56	17,050	-170
Nov. 30.....	8,366.69	17,290	+240
Dec. 31.....	8,366.64	17,200	-90
Calendar year 1960.....	-	-	+130
Jan. 31.....	8,366.69	17,290	+90
Feb. 28.....	8,366.72	17,350	+60
Mar. 31.....	8,366.65	17,220	-130
Apr. 30.....	8,366.72	17,350	+130
May 31.....	8,366.27	16,520	-830
June 30.....	8,366.63	17,180	+660
July 31.....	8,366.74	17,380	+200
Aug. 31.....	8,366.69	17,290	-90
Sept. 30.....	8,366.70	17,310	+20
Water year 1960-61.....	-	-	+90

† Elevation at 12 p.m.

9-165. Arapaho Creek at Monarch Lake Outlet, Colo.

Location.--Lat 40°06'45", long 105°44'57", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.24, T.2 N., R.75 W., on right bank a quarter of a mile downstream from Monarch Lake Outlet and 10 miles east of Granby.

Drainage area.--47.1 sq mi.

Records available.--October 1944 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,310 ft (from topographic map). Staff gage read twice daily at site 1 mile downstream at different datum, used for winter records.

Average discharge.--17 years, 83.0 cfs (60,090 acre-ft per year).

Extremes.--Maximum discharge during year, 675 cfs June 2 (gage height, 3.65 ft); minimum daily, 4.5 cfs Feb. 13, 14, 17, 21-24, 26. 1944-61: Maximum discharge, 1,300 cfs June 11, 1952 (gage height, 4.71 ft); minimum daily, 0.2 cfs Nov. 5, 1956 (spillway at Monarch Lake blocked for construction).

Remarks.--Records good except those for Dec. 9 to Apr. 15, and those for period of no gage-height record, which are fair. Natural regulation by Monarch Lake. No diversion above station.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 8

Dec. 9 to Apr. 15

Apr. 16 to Sept. 30

1.2	5.0	1.5	4.6	1.1	5.0	2.0	106
1.3	8.5	1.6	6.4	1.2	8.0	2.5	232
1.4	14			1.3	13	3.0	400
				1.5	31	4.0	860
				1.7	54		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.6	10	9.0	6.0	5.1	4.6	5.3	24	531	190	81	57
2	9.0	9.6	9.0	6.0	5.0	4.8	5.5	32	600	232	84	57
3	9.0	9.6	8.2	6.2	5.1	4.6	5.7	40	408	171	96	77
4	9.0	9.6	7.4	6.4	5.1	4.8	5.3	36	271	204	72	67
5	10	9.6	7.4	*6.4	5.1	5.0	5.5	30	232	168	58	64
6	10	9.6	7.8	6.2	5.1	4.8	*5.3	*15	241	166	58	92
7	9.6	9.6	7.4	6.4	4.8	4.8	5.3	36	272	196	58	114
8	9.6	9.6	7.4	6.0	*5.0	4.6	5.5	79	*385	163	57	210
9	8.5	9.6	7.4	5.5	5.1	5.0	5.7	49	479	150	44	210
10	8.2	9.6	7.7	5.5	4.8	5.0	5.9	26	511	148	40	253
11	8.2	9.6	7.2	5.3	5.0	4.8	5.7	47	403	106	41	148
12	8.2	9.6	7.2	5.5	4.8	4.8	5.9	203	432	*96	41	125
13	8.2	9.6	7.4	5.5	4.5	*4.8	5.7	207	447	110	42	*123
14	8.2	9.6	6.9	5.3	4.5	4.6	5.9	141	424	92	42	49
15	8.2	10	6.7	5.5	4.6	5.0	6.0	96	390	112	*42	164
16	8.2	10	7.4	5.3	4.8	4.8	6.2	77	390	108	42	10
17	8.2	9.6	6.9	5.5	4.5	5.0	6.6	*70	*443	82	123	32
18	8.5	9.6	6.7	5.5	4.6	5.0	7.4	72	379	70	63	82
19	8.5	*9.6	6.9	5.3	5.0	4.8	8.5	125	386	72	74	132
20	8.5	9.0	6.9	5.5	4.8	5.0	10	187	503	84	70	132
21	8.5	9.0	6.4	5.5	4.5	4.8	12	81	449	100	46	132
22	9.0	9.0	6.7	5.3	4.5	4.8	13	178	359	119	43	134
23	9.0	9.6	6.7	5.5	4.5	5.0	12	344	404	92	44	136
24	9.0	9.0	6.7	5.0	4.5	5.1	11	323	278	79	44	136
25	9.0	9.6	6.2	5.0	4.6	5.0	10	282	278	79	44	129
26	9.0	9.4	6.4	5.1	4.5	5.0	11	428	309	94	82	125
27	*9.0	9.4	6.7	5.3	4.6	4.8	10	410	259	73	54	123
28	9.0	9.4	6.7	5.3	4.8	4.8	14	443	265	70	73	125
29	9.6	9.6	6.2	5.0	-	5.0	18	515	292	60	77	136
30	10	9.6	6.4	5.1	-----	5.0	21	600	247	64	27	141
31	10	-----	6.4	5.3	-----	5.1	-----	499	-----	104	41	-----
Total	276.5	286.2	220.4	172.2	133.8	151.0	254.9	569.5	1126.7	365.4	180.3	351.5
Mean	8.92	9.54	7.11	5.55	4.78	4.87	8.50	184	376	118	58.2	117
Ac-ft	548	568	437	342	265	300	506	11,300	22,350	7,250	3,580	6,970

Calendar year 1960: Max 665 Min 5.1 Mean 82.0 Ac-ft 59,540

Water year 1960-61: Max 600 Min 4.5 Mean 75.1 Ac-ft 54,420

Peak discharge (base, 650 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-30	1a.m.	3.63	665	6-10	8a.m.	3.64	670
6-2	1a.m.	3.65	675	6-20	8:30a.m.	3.62	660

\* Discharge measurement made on this day.

Note.--No gage-height record Apr. 16 to May 6. Discharge computed from twice-daily staff-gage readings Dec. 9 to Apr.15.

## COLORADO RIVER MAIN STEM

9-185. Lake Granby near Granby, Colo.

Location--Lat 40°11'00", long 105°52'10", in NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 35, T.3 N., R.76 W., in Granby pumping plant at north shore of reservoir, 2 $\frac{1}{2}$  miles north of Granby Dam on Colorado River and 7 $\frac{1}{2}$  miles northeast of Granby.

Drainage area--311 sq mi.

Records available--October 1949 to September 1961. Prior to October 1955 published as Granby Reservoir near Granby.

Gage--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Apr. 9, 1951, staff gage at Granby Dam at same datum.

Extremes--Maximum contents during year, 383,200 acre-ft Sept. 30 (elevation, 8,268.25 ft); minimum, 213,500 acre-ft Apr. 28 (elevation, 8,240.08 ft).

1949-61: Maximum contents, 460,600 acre-ft July 8, 1958 (elevation, 8,279.31 ft); minimum since appreciable storage was first attained, 22,940 acre-ft Apr. 21, 1956 (elevation, 8,194.37 ft).

Remarks--Lake is formed by earth-fill dam and dikes. Regulation began Sept. 13, 1949, and usable storage began June 14, 1950, while dam was under construction. Usable capacity of lake, 465,600 acre-ft between elevations 8,186.00 (trashrack sills at outlet structures) and 8,280.00 ft (top of radial spillway gates). Dead storage, 74,190 acre-ft. Lake is used to store water for pumping to Shadow Mountain Lake and transmountain diversion through Alva B. Adams tunnel for power and irrigation in South Platte River basin. Figures given herein represent usable contents.

Cooperation--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet) †	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	8,265.05	361,900	-
Oct. 31.....	8,261.16	336,900	-25,000
Nov. 30.....	8,257.64	314,800	-22,100
Dec. 31.....	8,253.83	291,600	-23,200
Calendar year 1960.....	-	-	+13,200
Jan. 31.....	8,249.98	268,800	-22,800
Feb. 28.....	8,246.27	247,500	-21,300
Mar. 31.....	8,242.06	224,200	-23,300
Apr. 30.....	8,240.18	214,000	-10,200
May 31.....	8,248.35	259,400	+45,400
June 30.....	8,263.98	355,000	+95,600
July 31.....	8,265.24	363,200	+8,200
Aug. 31.....	8,264.79	360,200	-3,000
Sept. 30.....	8,268.25	383,200	+23,000
Water year 1960-61.....	-	-	+21,300

† Elevation at 12 p.m.



9-190. Colorado River below Lake Granby, Colo.

Location.--Lat 40°08'39", long 105°52'00", in SE<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec. 11, T.2 N., R.76 W., on right bank 0.3 mile downstream from Granby Dam, 1 mile upstream from Walden Hollow, and 5 miles northeast of Granby.

Drainage area.--311 sq mi.

Records available.--October 1950 to September 1961. Prior to October 1955 published as "below Granby Reservoir."

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,050 ft (from topographic map).

Extremes.--Maximum discharge during year, 96 cfs June 12-19; maximum gage height, 1.75 ft June 15-19; minimum daily discharge, 5.6 cfs Sept. 23-28.

1950-61: Maximum discharge, 437 cfs June 20-30, 1952; maximum gage height, 3.91 ft June 17, 1952; minimum daily discharge, that of Sept. 23-28.

Remarks.--Records excellent. Seepage from Lake Granby, which varies from 2-8 cfs, depending on elevation of Lake Granby, is not included in record. Flow completely regulated by Lake Granby (see preceding page). Several diversions for irrigation of hay meadows above station. Transmountain diversions by Eureka and Grand River ditches and Alva B. Adams tunnel (see elsewhere in this report).

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.3	5.6	1.5	75
.6	17	2.0	119
1.0	39		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	21	21	18	20	18	19	39	78	88	58	18
2	21	21	21	18	20	18	19	59	75	88	44	11
3	21	21	21	18	19	17	19	60	72	85	30	12
4	21	21	21	18	19	17	20	60	72	83	24	11
5	21	21	21	18	19	17	20	60	72	80	24	10
6	21	21	21	18	19	17	20	*60	81	79	24	8.8
7	21	21	21	18	*19	19	19	60	91	82	24	8.4
8	21	21	21	18	19	20	20	60	92	82	24	9.5
9	21	21	21	18	20	20	20	60	92	82	24	9.5
10	21	21	21	18	20	*19	19	60	*92	82	24	9.9
11	21	21	21	19	20	19	19	60	92	*82	24	9.9
12	21	21	21	20	20	19	19	60	94	82	24	10
13	21	21	20	20	19	19	*19	61	95	82	24	*10
14	21	21	18	20	19	19	19	61	96	82	*24	10
15	21	*21	18	20	19	19	19	61	96	82	24	10
16	21	21	19	19	19	19	19	61	96	82	24	10
17	*21	21	19	19	19	19	20	61	96	83	24	10
18	21	21	19	20	19	19	20	61	96	81	24	10
19	21	21	19	20	19	19	18	61	89	79	24	11
20	21	21	19	20	19	19	18	61	84	79	24	11
21	21	21	19	20	19	19	18	61	82	75	24	9.1
22	21	21	19	20	19	19	18	61	82	74	24	5.6
23	21	21	19	20	19	19	17	61	83	73	24	5.6
24	21	21	19	20	19	19	17	61	83	76	24	5.6
25	21	21	19	20	19	19	18	59	83	79	24	5.6
26	21	21	19	20	19	19	18	61	84	79	24	5.6
27	21	21	19	20	18	19	18	62	87	76	24	5.6
28	21	21	19	20	18	19	18	67	88	74	24	5.6
29	21	21	19	20	-	20	19	76	88	74	24	12
30	21	21	19	20	-----	20	20	76	88	74	24	19
31	21	-----	19	20	-----	20	-----	75	-----	74	24	-----
Total	651	630	612	597	536	584	566	1,906	2,600	2,473	804	290.3
Mean	21.0	21.0	19.7	19.3	19.1	18.8	18.9	61.5	86.7	79.8	25.9	9.68
Ac-ft	1,290	1,250	1,210	1,180	1,060	1,160	1,120	3,780	5,160	4,910	1,590	576

Calendar year 1960: Max 79 Min 18 Mean 35.6 Ac-ft 25,840  
 Water year 1960-61: Max 96 Min 5.6 Mean 33.6 Ac-ft 24,290

\* Discharge measurement made on this day.

## COLORADO RIVER MAIN STEM

9-195. Colorado River near Granby, Colo.

Location (revised).--Lat 40°07'15", long 105°54'00", in SW<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub> sec.22, T.2 N., R.76 W., on right bank 0.3 mile upstream from bridge on U. S. Highway 34, 1.3 miles upstream from Willow Creek, and 3.2 miles northeast of Granby.

Drainage area.--322 sq mi.

Records available.--October 1907 to September 1911 (published as Grand River near Granby), October 1933 to September 1953, May to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 7,960 ft (from topographic map). June 10, 1908, to Sept. 30, 1911, staff gage and May 12 to June 10, 1934, chain gage, at site 300 ft upstream at different datums. June 11, 1934, to Sept. 30, 1953, water-stage recorder at same site and datum.

Extremes.--Maximum discharge during period May to September, 90 cfs June 9 (gage height, 1.15 ft); minimum daily, 16 cfs Sept. 7, 1907-11, 1933-53, 1961: Maximum discharge observed, 4,100 cfs June 20, 1909 (gage height, 5.5 ft, site and datum then in use); minimum daily, 6.6 cfs Jan. 29, 1950; minimum observed, prior to starting construction of Shadow Mountain Lake, 20 cfs Apr. 6, 1936 (discharge measurement).

Remarks.--Records good. Flow regulated by Lake Granby since Sept. 13, 1949 (see elsewhere in this report). Several diversions for irrigation of hay meadows above station. Transmountain diversions above station by Eureka and Grand River ditches and Alva B. Adams tunnel (see elsewhere in this report).

Cooperation.--Two discharge measurements furnished by Bureau of Reclamation.

Rating table, period May to September 1961 (gage height, in feet, and discharge, in cubic feet per second)

0.3	16
.5	26
.8	50
1.1	83

Discharge, in cubic feet per second, May to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								* 30	69	64	45	28
2								* 62	69	68	35	20
3								64	68	66	32	22
4								67	66	66	28	22
5								67	66	62	28	23
6								* 66	70	57	30	19
7								66	* 81	60	30	16
8								67	79	60	30	18
9								66	81	61	30	18
10								64	75	60	30	18
11								66	73	* 60	30	18
12								66	73	61	31	18
13								68	76	61	30	* 19
14								67	77	61	30	18
15								67	77	61	* 30	18
16								68	77	61	32	18
17								68	77	61	32	18
18								67	77	63	30	20
19								66	71	60	30	21
20								67	67	62	31	20
21								67	63	70	31	20
22								68	60	77	31	22
23								70	60	64	31	20
24								69	61	59	31	19
25								62	61	64	32	18
26								60	63	63	32	18
27								51	64	61	32	19
28								54	64	57	31	19
29								66	63	57	31	30
30								62	64	59	32	35
31								69	-----	59	34	-----
Total								1,987	2,092	1,925	972	612
Mean								64.1	69.7	62.1	31.4	20.4
Ac-ft								3,940	4,150	3,820	1,930	1,210

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max - Min - Mean - Ac-ft -

\* Discharge measurement made on this day.

## WILLOW CREEK BASIN

143

9-207. Willow Creek Reservoir near Granby, Colo.

Location--Lat 40°08'40", long 105°56'30", in SE $\frac{1}{4}$  sec. 7, T.2 N., R.76 W., in shaft house near right end of Willow Creek Dam on Willow Creek,  $\frac{3}{4}$  miles upstream from mouth, and 4 miles north of Granby.

Drainage area--134 sq mi.

Records available--May 1953 to September 1961.

Gage--Water-stage recorder. Datum of gage is 8,077.00 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation); gage readings have been reduced to elevations above mean sea level.

Extremes--Maximum contents during year, 8,800 acre-ft Sept. 7 (elevation, 8,129.12 ft); minimum, 5,360 acre-ft Nov. 21 (elevation, 8,115.16 ft).  
1953-61: Maximum contents observed, 9,060 acre-ft Aug. 3, 1953 (elevation, 8,129.99 ft); minimum since first filling to spillway level, 4,550 acre-ft Oct. 10, 11, 1957 (elevation, 8,110.92 ft).

Remarks--Reservoir is formed by earth- and rock-fill dam. Storage began in March 1953 and dead storage pool filled May 3, 1953. Usable capacity, 9,060 acre-ft between elevations 8,077.00 (trashrack sill at Willow Creek Outlet) and 8,130.00 ft (crest of spillway). Dead storage, 1,490 acre-ft. Reservoir is used to store water for pumping to Lake Granby, Shadow Mountain Lake, and transmountain diversion through Alva B. Adams tunnel for power and irrigation in the South Platte River basin. It is part of the Colorado-Big Thompson project. Figures given herein represent usable contents.

Cooperation--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	8,126.03	7,920	-
Oct. 31.....	8,127.23	8,250	+330
Nov. 30.....	8,115.55	5,430	-2,820
Dec. 31.....	8,116.80	5,690	+260
Calendar year 1960.....	-	-	-400
Jan. 31.....	8,117.61	5,860	+170
Feb. 28.....	8,118.73	6,110	+250
Mar. 31.....	8,120.30	6,470	+360
Apr. 30.....	8,119.90	6,380	-90
May 31.....	8,119.42	6,270	-110
June 30.....	8,119.00	6,170	-100
July 31.....	8,121.36	6,720	+550
Aug. 31.....	8,127.36	8,290	+1,570
Sept. 30.....	8,123.10	7,150	-1,140
Water year 1960-61.....	-	-	-770

† Elevation at 12 p.m.

## WILLOW CREEK BASIN

9-210. Willow Creek below Willow Creek Reservoir, Colo.

Location--Lat 40°08'45", long 105°56'22", in SE $\frac{1}{4}$  sec. 7, T.2 N., R.76 W., on left bank 1,000 ft downstream from Willow Creek Dam, three-quarters of a mile upstream from Bunte Highline Canal diversion, 3 miles upstream from mouth, and 4 miles north of Granby.

Drainage area--134 sq mi.

Records available--August 1953 to September 1961.

Gage--Water-stage recorder and 10-ft Parshall flume with overflow weirs. Datum of gage is 8,023.64 ft above mean sea level (Bureau of Reclamation bench mark). Supplementary water-stage recorder and Parshall flume on McQueary ditch 500 ft downstream from point of diversion at Willow Creek Dam. Datum of gage is 8,031.68 ft above mean sea level (Bureau of Reclamation bench mark).

Average discharge (combined flow)--8 years, 22.7 cfs (16,430 acre-ft per year).

Extremes (combined flow)--Maximum discharge during year, 52 cfs June 9; minimum daily, 0.1 cfs May 1-10, Aug. 9-11. 1953-61: Maximum discharge, 867 cfs June 7, 1957; minimum daily, that of May 1-10, Aug. 9-11, 1961.

Remarks--Records good. Records show combined flow of creek, McQueary ditch, and waste from pump canal. Flow completely regulated by Willow Creek Reservoir (see preceding page). Diversions above station for irrigation of hay meadows. McQueary ditch diverts at Willow Creek Dam for irrigation below station. Record of diversion from Willow Creek Reservoir by Willow Creek Pump Canal to Lake Granby as part of the Colorado-Big Thompson project is given below:

Month	Diversion in acre-feet	Month	Diversion in acre-feet
October.....	0	April.....	1,180
November.....	3,070	May.....	15,480
December.....	0	June.....	10,000
	- - - - -	July.....	20
Calendar year 1960....	-	August.....	0
	- - - - -	September.....	4,620
January.....	0		
February.....	0		
March.....	0	Water year 1960-61....	34,370

Cooperation--Records of diversions to Lake Granby and waste from Willow Creek Pump Canal furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	6.7	6.5	6.2	5.3	6.1	5.9	0.1	3.8	4.7	0.2	0.5
2	16	6.7	6.5	6.2	5.3	6.1	5.9	.1	3.8	4.7	.2	.6
3	13	6.7	6.5	6.2	5.2	6.2	5.9	.1	3.9	4.7	.2	.7
4	11	6.7	6.4	*6.2	5.2	6.2	5.9	.1	3.9	4.7	.2	.7
5	11	6.7	6.4	6.2	5.2	6.3	5.8	.1	4.5	4.7	.2	.7
6	11	6.7	6.4	6.2	5.1	6.3	5.8	*.1	2.4	4.7	.2	.7
7	11	6.7	6.4	6.1	5.1	6.4	5.8	.1	5.8	4.7	.2	2.2
8	11	6.7	6.4	6.1	*5.1	6.4	5.7	.1	*6.4	4.7	.2	.6
9	11	6.7	6.4	6.1	5.2	6.5	5.7	.1	3.4	4.7	.1	.6
10	14	6.6	6.4	6.0	5.2	*6.5	5.7	.1	5.1	4.4	.1	.6
11	16	6.6	6.4	6.0	5.3	6.5	5.6	4.0	5.1	4.1	**1	.6
12	16	6.6	6.4	6.0	5.3	6.4	5.6	6.9	5.0	*3.9	.2	.6
13	16	6.6	6.4	5.9	5.4	6.4	*5.6	6.9	5.0	3.9	.2	.6
14	16	6.6	6.4	5.9	5.4	6.4	5.6	6.9	4.8	3.9	.2	.6
15	11	*6.6	6.4	5.9	5.4	6.4	5.6	6.9	4.8	3.9	.2	.6
16	6.7	6.6	6.3	5.8	5.5	6.3	5.6	6.9	4.8	3.9	.2	.7
17	*6.4	6.6	6.3	5.8	5.5	6.3	5.6	6.9	4.9	3.7	.2	.7
18	6.4	6.6	6.3	5.8	5.6	6.3	5.6	6.9	4.9	3.4	.2	1.3
19	6.7	6.6	6.3	5.7	5.6	6.3	5.6	6.7	4.9	2.8	.2	.8
20	7.1	6.6	6.3	5.7	5.7	6.2	5.6	6.5	4.9	2.5	.3	.8
21	7.1	6.6	6.3	5.7	5.7	6.2	3.3	6.8	5.0	2.5	.2	.8
22	7.1	1.4	6.3	5.6	5.8	6.2	9.6		4.9	2.4	.2	.9
23	7.1	6.5	6.3	5.6	5.8	6.2	5.6	1.6	4.9	2.4	.2	.9
24	7.4	6.5	6.3	5.6	5.8	6.1	5.6	1.9	4.9	2.4	.2	.9
25	6.7	6.5	6.3	5.5	5.9	6.1	5.6	1.9	4.8	3.8	.4	.9
26	6.7	6.5	6.3	5.5	5.9	6.1	5.6	1.9	4.8	3.9	.4	.9
27	6.7	6.5	6.3	5.5	6.0	6.1	5.6	1.9	4.8	3.2	.4	.9
28	6.7	6.5	6.2	5.4	6.0	6.0	3.6	2.0	4.9	3.1	.4	.9
29	6.7	6.5	6.2	5.4	-	6.0	5.6	3.2	4.9	.3	.4	4.7
30	6.7	6.5	6.2	5.4	-----	6.0	5.6	3.8	4.8	.4	.4	7.1
31	6.7	-----	6.2	5.3	-----	6.0	-----	3.8	-----	.2	.5	-----
Total	308.9	205.5	195.7	180.5	153.5	193.5	231.9	312.3	1,298.2	1,078.9	7.6	65.6
Mean	9.96	6.85	6.35	5.82	5.48	6.24	7.73	10.1	43.3	34.8	0.25	2.19
Ac-ft	613	408	390	358	304	384	460	619	2,570	2,140	15	130

Calendar year 1960: Max 46

Min 5.0

Mean 13.6

Ac-ft 9,880

Water year 1960-61: Max 51

Min 0.1

Mean 11.6

Ac-ft 8,390

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note--No gage-height record Oct. 26 to May 22.



## 9-240. Fraser River near Winter Park, Colo.

Location.--Lat 39°54'00", long 105°46'35", in NE $\frac{1}{4}$  sec. 4, T.2 S., R.75 W., on left bank 500 ft downstream from bridge on U. S. Highway 40, 1.1 miles northwest of Winter Park, 2 miles upstream from Vasquez Creek,  $\frac{3}{4}$  miles downstream from point of diversion for Moffat water tunnel, and 4 miles southeast of Fraser.

Drainage area.--27.6 sq mi.

Records available.--September 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "near Arrow" 1910-23 and as "near West Portal" 1924-39. Records since June 9, 1936, equivalent to earlier records if transmountain diversions are added to flow past station.

Gage.--Water-stage recorder. Datum of gage is 8,906.23 ft above mean sea level (State Highway bench mark). Sept. 23, 1910, to May 12, 1916, staff gage at trail bridge 1 mile upstream at different datum.

Average discharge.--51 years, 40.9 cfs (29,610 acre-ft per year) including diversions to Berthoud Pass ditch and Moffat water tunnel.

Extremes.--Maximum discharge during year, 146 cfs June 21 (gage height, 1.28 ft); maximum gage height, 1.72 ft Dec. 2 (backwater from ice); minimum daily discharge, 2.8 cfs Oct. 7, 8.  
1910-61: Maximum discharge, 820 cfs June 13, 1918 (gage height, 2.9 ft); minimum, 2 cfs Mar. 30, 1912.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Transmountain diversions above station through Berthoud Pass ditch (see elsewhere in this report) and to Moffat water tunnel (see adjustment figures below).

Cooperation.--Record of flow diverted to Berthoud Pass ditch and Moffat water tunnel furnished by State engineer.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	1.4	1.0			8.2	5.8	1.4	1.4	1.0	9.8	4.8
2	3.0	1.5	1.0			7.8	5.6	1.6	1.6	8.2	9.4	4.5
3	3.0	1.5	1.1			7.4	5.8	1.7	1.5	7.4	9.0	5.4
4	3.0	1.6	1.1	(*)		7.4	6.2	1.6	1.4	9.0	8.6	5.6
5	3.0	1.6	1.0			7.4	6.2	1.2	1.3	8.6	8.6	8.2
6	3.0	1.5	9.6		(*)	7.0	5.8	9.0	1.4	7.0	8.6	8.6
7	2.8	1.5	9.6			7.2	5.8	*8.6	1.3	6.6	8.6	7.8
8	2.8	1.4	9.6			7.4	5.8	8.2	1.3	6.6	9.4	*6.6
9	3.2	1.3	1.0			*7.4	6.0	1.0	*1.3	5.8	9.0	5.8
10	3.2	1.3	1.1			7.4	6.2	1.4	1.3	5.8	8.6	5.2
11	3.0	1.4	1.1			7.4	6.2	1.7	1.3	5.8	*8.6	4.8
12	3.2	1.4	1.2			7.6	6.6	1.5	1.5	5.8	9.4	4.5
13	*3.0	1.4	1.0			7.6	7.0	1.2	2.7	*5.6	9.4	4.3
14	3.0	1.3	1.0			7.8	6.8	9.8	1.3	5.4	8.6	4.1
15	3.0	1.2	9.0	6.0	6.5	8.0	6.8	1.0	1.7	5.4	7.0	4.1
16	4.7	1.2	9.2			8.2	7.0	1.1	3.1	5.2	7.8	4.1
17	3.4	*1.3	1.0			7.8	8.2	1.3	3.9	5.2	9.0	4.1
18	2.8	1.3	1.1			7.8	9.4	1.3	5.0	5.0	6.6	4.3
19	2.1	1.2	1.0			7.8	1.2	1.4	3.8	4.8	6.2	5.0
20	2.0	1.1	1.1			7.4	1.1	1.4	1.3	6.6	5.8	7.4
21	1.2	1.0	1.1			8.2	9.8	1.4	6.5	9.0	6.2	1.1
22	1.3	1.0	1.0			8.0	1.1	1.4	1.28	6.6	5.8	4.0
23	1.2	1.1	1.0			8.0	1.0	1.4	1.18	5.4	5.6	3.9
24	1.2	1.1	1.0			8.6	8.6	1.4	7.1	5.2	5.8	3.6
25	1.2	1.1	9.0			8.6	8.2	*1.3	7.1	9.0	5.8	3.4
26	1.2	1.1	8.2			8.2	7.6	1.4	5.1	9.4	6.2	3.8
27	1.3	1.1	7.6			8.2	7.4	1.4	1.0	7.8	6.2	3.9
28	1.4	1.1	7.0			7.8	8.2	1.4	8.6	7.4	5.8	3.9
29	1.5	1.0	6.2			8.6	1.0	2.0	8.6	7.4	5.8	4.1
30	1.4	9.2	5.8			6.6	1.2	2.1	9.4	9.4	6.6	3.5
31	1.3	-----	5.6	-----	-----	5.2	-----	1.4	-----	1.1	5.0	-----
Total	294.9	379.2	295.4	186.0	182.0	239.0	233.0	419.6	934.6	217.4	232.8	461.2
Mean	9.51	12.6	9.53	6.0	6.5	7.71	7.77	13.5	31.2	7.01	7.51	15.4
Ac-ft	585	752	586	369	361	474	462	832	1,850	431	462	915

Adjusted for diversions to Berthoud Pass ditch and Moffat water tunnel

Mean	14.9	12.6	9.53	6.0	6.5	7.71	7.77	47.9	130	49.8	33.4	39.2
Ac-ft	916	752	586	369	361	474	462	2,950	7,720	3,060	2,050	2,340

## Observed

Calendar year 1960: Max	212	Min	2.8	Mean	17.7	Ac-ft	12,880
Water year 1960-61: Max	128	Min	2.8	Mean	11.2	Ac-ft	8,080

## Adjusted

Calendar year 1960: Max	-	Min	-	Mean	37.7	Ac-ft	27,390
Water year 1960-61: Max	-	Min	-	Mean	30.5	Ac-ft	22,050

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 26 to Nov. 17, Dec. 31 to Jan. 4, Jan. 9 to Mar. 9 (stage-discharge relation affected by ice during most of periods). Stage-discharge relation affected by ice Nov. 18 to Dec. 2, Dec. 5-9, 13-17, 25-30, Jan. 5-8, Mar. 12-15, 22, 23, Apr. 6, 7, 9, 14, 15, 26.

## FRASER RIVER BASIN

9-250. Vasquez Creek near Winter Park, Colo.

Location.--Lat 39°55'13", long 105°47'05", in NE 1/4 sec. 33, T.1 S., R.75 W., on right bank 40 ft downstream from bridge on U. S. Highway 40, a quarter of a mile upstream from mouth, 2 1/2 miles northwest of Winter Park, 2 1/2 miles southeast of Fraser, and 4 1/2 miles downstream from Moffat water tunnel diversion.

Drainage area.--27.8 sq mi.

Records available.--June 1907 to October 1909 (irrigation seasons only), October 1933 to September 1961. Published as Vasquez River at lower station, near Fraser 1907-9 and as "near West Portal" 1934-39. Records for May 26, 1937, to September 1939, equivalent to earlier records if diversion to Moffat water tunnel is added to flow past station.

Gage.--Water-stage recorder and concrete control. Datum of gage is 8,768.48 ft above mean sea level, unadjusted. June 1, 1907, to Oct. 31, 1909, staff gage at site three-quarters of a mile upstream at different datum.

Extremes.--Maximum discharge during year, 151 cfs June 16 (gage height, 2.08 ft); minimum daily, 0.5 cfs Aug. 29. 1933-61: Maximum discharge, 470 cfs June 10, 1952 (gage height, 3.13 ft), from rating curve extended above 340 cfs; no flow at times in 1944, 1946, 1956, 1960.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Transmountain diversions above station to Moffat water tunnel not known since 1959.

Discharge, in cubic feet per second, water year October 1960 to September 1961														
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1	1.6	6.2	0.8	(*)			1.7	5.8	5.8	3.9	1.1	0.8		
2	1.4	6.0	.9						1.8	8.1	6.2	2.1	1.0	.8
3	1.4	6.0	1.0						*1.9	7.7	6.2	1.4	.9	1.4
4	1.3	5.8	1.0						2.0	7.7	5.8	1.0	.9	1.4
5	1.3	5.8	.9						2.4	5.8	5.5	8.8	.9	2.0
6	1.1	6.0	.8	(*)			2.0	5.8	5.2	7.3	.9	1.8		
7	1.0	5.8	.8						2.0	*4.6	4.6	6.2	.9	1.8
8	.9	6.2	.8						1.8	4.3	4.6	4.9	.9	1.4
9	.9	5.4	.9						2.0	5.2	*4.3	4.0	1.0	1.1
10	.9	4.6	.9						(*)	1.6	6.9	4.3	3.2	1.0
11	.8	4.6	.9	1.8	1.5	1.7	1.6	9.2	4.0	3.2	*1.0	.6		
12	.8	4.8	.8						2.2	10	4.0	2.7	1.3	.9
13	*.7	2.0	.9						2.9	8.8	3.7	*2.7	1.3	2.9
14	.9	1.1	.9						2.9	7.3	4.0	2.7	1.3	*2.9
15	1.0	1.1	.9						1.8	7.7	8.7	2.7	1.0	2.9
16	.9	1.0	1.1	1.8	1.5	1.7	1.6	7.7	7.6	2.7	1.0	1.6		
17	1.0	.8	2.7						1.8	8.5	10.4	2.7	1.8	1.4
18	1.1	*.9	3.4						2.9	10	9.4	2.7	1.3	1.4
19	1.0	1.1	2.2						4.0	11	7.6	2.4	1.0	1.8
20	1.4	1.1	1.8						4.6	11	12	2.4	.7	2.4
21	7.7	1.4	1.8				2.7	11	5.8	1.8	.8	3.2		
22	7.3	1.3	2.0						3.2	10	9.6	1.6	.8	9.6
23	7.3	1.3	1.8						3.4	9.2	7.6	1.3	.6	3.7
24	7.7	1.4	1.6						3.4	8.5	3.9	1.0	.6	3.4
25	7.3	1.0	1.4						4.6	8.1	3.3	.9	.8	4.4
26	6.9	.8	1.3				3.4	7.7	3.0	1.0	.8	4.2		
27	6.5	.8	1.3						2.9	7.3	2.4	1.0	.7	4.6
28	6.9	.8	1.3						2.9	6.9	1.7	.9	.6	4.6
29	5.8	.8	1.2						3.2	7.7	1.2	.9	.5	5.8
30	5.2	.8	1.2						4.6	6.9	1.2	.9	.8	5.0
31	4.5	-----	1.2		-----		-----	6.2	-----	1.0	1.0	-----		
Total	94.5	86.7	40.5	55.8	42.0	52.7	79.8	242.6	835.9	157.6	29.2	80.8		
Mean	3.05	2.89	1.31	1.8	1.5	1.7	2.66	7.83	27.9	5.08	0.94	2.69		
Ac-ft	187	172	80	111	83	105	158	481	1,660	313	58	160		

Calendar year 1960: Max 230 Min 0 Mean 9.86 Ac-ft 7,160  
 Water year 1960-61: Max 104 Min 0.5 Mean 4.93 Ac-ft 3,570

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 29 to Apr. 3 (stage-discharge relation affected by ice during part of period), Sept. 26-30.

## FRASER RIVER BASIN

147

9-265. St. Louis Creek near Fraser, Colo.

Location.--Lat 39°54'30", long 105°52'45", in sec.34, T.1 S., R.76 W., on left bank 300 ft downstream from West St. Louis Creek and 4 miles southwest of Fraser.

Drainage area.--32.8 sq mi.

Records available.--October 1933 to September 1961. Records for May 1956 to September 1959, equivalent to earlier records if diversion to Moffat water tunnel is added to flow past station.

Gage.--Water-stage recorder. Datum of gage is 8,980.17 ft above mean sea level, unadjusted.

Extremes.--Maximum discharge during year, 65 cfs June 23 (gage height, 1.52 ft); minimum not determined.

1933-61: Maximum discharge, 470 cfs June 15, 1952 (gage height, 2.89 ft); maximum gage height, 3.21 ft June 10, 1952 (backwater from log on control); minimum discharge not determined, probably occurred during January or February 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Transmountain diversion above station to Moffat water tunnel not known since 1959.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 11-14)

0.5	2.0	1.1	24
.6	3.4	1.3	40
.7	5.8	1.5	62
.9	12		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	12	3.1			3.0	7.9	14	20	44	26	12
2	2.8	11	3.1			3.2	5.8	14	20	42	25	12
3	2.8	11	3.1			3.3	5.6	8.8	20	39	21	7.9
4	2.8	11	3.1	(*)		3.2	5.6	8.5	26	41	20	7.0
5	2.8	11	3.0			2.9	5.6	7.0	26	38	20	8.8
6	2.8	11	3.0			2.7	7.6	6.7	26	36	19	6.7
7	2.8	11	3.1		(*)	2.5	7.6	*5.3	26	37	21	6.1
8	2.8	11	3.4			*2.7	4.4	5.1	27	35	23	5.3
9	3.1	10	3.2			2.5	5.3	6.7	*2.8	37	22	5.1
10	2.8	8.0	3.3			2.7	3.0	10	27	36	18	5.1
11	2.8	7.0	3.3			4.1	2.7	12	28	35	*17	4.4
12	3.0	7.9	3.0			5.6	3.0	13	28	37	18	11
13	2.7	7.0	2.8			6.1	*2.7	11	27	*38	19	3.0
14	*3.3	5.6	2.7			6.7	2.7	8.8	30	38	16	*29
15	3.1	4.4	2.7			6.7	4.6	8.5	37	37	16	28
16	3.6	*4.8	2.7	2.0	2.8	6.4	3.0	9.4	54	36	17	18
17	13	3.9	2.9			6.7	3.3	10	55	36	18	9.4
18	12	4.1	3.1			6.4	5.3	12	54	37	16	9.4
19	12	4.4	3.1			7.9	7.6	14	54	36	16	10
20	12	4.4	3.1			6.7	10	14	50	40	15	10
21	12	5.3	3.1			7.6	6.7	14	46	42	16	8.2
22	12	4.1	3.3			11	7.9	13	58	38	15	7.9
23	12	3.6	3.3			14	9.4	12	57	35	14	7.9
24	11	3.9	3.1			11	7.9	11	55	34	14	7.3
25	11	3.6	2.8			7.9	9.4	11	52	34	16	7.9
26	11	3.4	2.6			7.0	8.8	11	51	34	16	7.6
27	11	3.4	2.4			6.7	6.7	11	49	34	14	7.9
28	11	3.4	2.3			11	9.1	12	48	34	14	7.9
29	10	3.3	2.3			10	9.4	12	44	34	13	10
30	9.0	3.3	2.3			12	12	12	45	33	14	8.8
31	8.0	-----	2.3		-----	12	-----	20	-----	32	13	-----
Total	213.8	197.8	90.6	62.0	78.4	202.2	190.6	337.8	1168	1139	542	316.6
Mean	6.90	6.59	2.92	2.0	2.8	6.52	6.35	10.9	38.9	36.7	17.5	10.6
Ac-ft	424	392	180	123	156	401	378	670	2,320	2,260	1,080	628

Calendar year 1960: Max 178 Min - Mean 18.2 Ac-ft 13,220  
Water year 1960-61: Max 58 Min - Mean 12.4 Ac-ft 9,010

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 2, 3, 6, 9-11, Jan. 4-11, Mar. 9. No gage-height record Dec. 9 to Jan. 3, Jan. 12 to Mar. 7 (stage-discharge relation affected by ice during most of periods).

## FRASER RIVER BASIN

9-320. Ranch Creek near Fraser, Colo.

Location.--Lat 39°57'00", long 105°45'54", in NW¼NE¼ sec.22, T.1 S., R.75 W., on right bank 450 ft downstream from Middle Fork and 2.7 miles east of Fraser.

Drainage area.--19.9 sq mi.

Records available.--August 1934 to September 1961. Records since May 15, 1949, equivalent to earlier records if diversion to Moffat water tunnel is added to flow past station.

Gage.--Water-stage recorder. Altitude of gage is 8,685 ft (from topographic map).

Average discharge.--27 years, 20.9 cfs (15,130 acre-ft per year), including diversion to Moffat water tunnel.

Extremes.--Maximum discharge during year, 55 cfs June 21 (gage height, 1.60 ft); minimum daily, 0.4 cfs Oct. 6.  
1934-61: Maximum discharge, 402 cfs June 28, 1957 (gage height, 3.72 ft); minimum daily, 0.4 cfs Sept. 21, Oct. 6, 1960.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversion above station for irrigation of hay meadows along Fraser River. Transmountain diversion above station to Moffat water tunnel was 8,680 acre-ft during water year 1961.

Cooperation.--Records of flow diverted to Moffat water tunnel furnished by State engineer.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1 to Dec. 13)

Mar. 1 to Sept. 30

0.3	1.0	0.8	8.7
.4	1.7	1.0	16
.5	2.7	1.2	26
.6	4.1	1.5	46
.7	5.9		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	b3.1	1.6			1.3	1.4	3.9	16	12	2.8	2.8
2	.6	b3.4	1.6			1.3	1.4	4.9	17	9.4	2.6	2.7
3	.6	b3.6	1.5			1.2	1.4	5.7	15	8.0	3.0	3.0
4	.6	b3.6	1.5			1.2	1.4	5.9	13	7.4	2.9	2.3
5	.5	3.7	1.4	(*)		1.2	1.4	4.7	11	6.1	2.9	3.2
6	.4	b3.7	1.4			1.2	1.3	4.9	9.8	5.5	2.9	3.6
7	.5	b3.6	1.4		(*)	1.2	1.3	*3.8	8.7	5.9	2.9	3.2
8	.6	b3.3	1.3			1.2	1.3	3.4	8.0	5.5	2.9	3.0
9	1.1	b3.0	1.4			1.2	1.2	4.7	*6.8	3.6	2.9	2.8
10	1.3	b3.1	1.4			*1.2	1.2	6.6	6.1	2.7	2.9	2.6
11	1.3	b3.3	1.4			1.2	1.2	9.4	5.9	2.5	*2.8	2.3
12	1.2	b3.3	1.4			1.2	*1.2	9.8	5.5	*2.3	2.9	6.5
13	*1.2	b2.7	1.3			1.2	1.2	7.7	5.5	2.3	3.2	*1.7
14	1.2	b2.7				1.2	1.2	6.4	5.3	2.2	3.0	*1.7
15	1.2	b2.2				1.2	1.2	5.7	4.1	2.0	2.8	1.6
16	1.4	*2.1		1.1	1.2	1.2	1.1	6.1	8.3	1.9	2.8	7.7
17	3.0	2.0				1.3	1.2	6.6	19	1.8	3.6	2.0
18	2.3	2.1				1.3	1.4	8.0	24	1.7	3.0	2.0
19	2.2	1.7				1.3	2.0	10	22	1.6	2.8	2.6
20	2.3	1.8				1.2	1.9	12	23	1.9	2.7	3.8
21	2.3	b1.8				1.2	1.6	14	27	3.2	2.8	4.4
22	2.3	b1.8	1.2			1.2	2.0	15	40	3.0	2.8	1.3
23	2.3	2.0				1.3	2.0	15	34	5.3	2.7	4.1
24	2.3	2.6				1.3	1.9	15	30	6.8	2.7	3.6
25	2.2	2.4				1.3	1.9	15	25	3.2	2.7	3.6
26	2.4	2.3				1.3	2.2	16	21	2.9	2.7	3.6
27	2.2	2.2				1.3	1.7	16	15	2.7	2.5	3.9
28	3.2	2.0				1.3	2.0	15	12	3.0	2.4	4.2
29	3.3	1.8				1.3	2.8	15	10	3.0	2.4	5.3
30	b3.1	1.7				1.4	3.3	14	11	3.0	2.6	4.5
31	b2.9					1.3		15		2.9	2.9	
Total	52.5	78.6	40.2	34.1	33.6	38.7	48.3	295.2	459.0	125.3	87.5	156.3
Mean	1.69	2.62	1.30	1.1	1.2	1.25	1.61	9.52	15.3	4.04	2.82	5.21
Ac-ft	104	156	80	68	67	77	96	586	910	249	174	310

Calendar year 1960: Max 186 Min 0.4 Mean 15.4 Ac-ft 11,190  
Water year 1960-61: Max 40 Min 0.4 Mean 3.97 Ac-ft 2,880

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 14 to Mar. 10 (stage-discharge relation affected by ice during most of period).



## 9-345. Colorado River at Hot Sulphur Springs, Colo.

Location.--Lat 40°05'00", long 106°05'15", in NE<sup>1</sup>NE<sup>1</sup> sec.2, T.1 N., R.78 W., on left bank about 1,000 ft north of U. S. Highway 40, 1 mile northeast of Hot Sulphur Springs, and 4½ miles upstream from Beaver Creek.

Drainage area.--782 sq mi.

Records available.--July 1904 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Prior to 1907 and 1914-18, published as Grand River at Hot Sulphur Springs and as Grand River at Sulphur Springs 1907-13.

Gage.--Water-stage recorder. Altitude of gage is 7,670 ft (from railroad elevations). July 28, 1904, to Apr. 16, 1906, staff gage on bridge 1.7 miles downstream at different datum. Apr. 17, 1906, to Sept. 18, 1930, chain gage at bridge 1.4 miles downstream at datum 7,651.26 ft above mean sea level, unadjusted. Supplemental staff gage at different datum read twice daily at site 1.7 miles downstream, used for winter records.

Extremes.--Maximum discharge during year, 638 cfs Sept. 29 (gage height, 1.56 ft); minimum daily, 43 cfs Dec. 30, Jan. 8, 12. 1904-61: Maximum discharge observed, 10,300 cfs June 15, 1921 (gage height, 8.7 ft, site and datum then in use); minimum daily, 33 cfs Sept. 27, 1956.

Remarks.--Records excellent except those for Dec. 1 to Apr. 15 and those for periods of ice effect or no gage-height record, which are fair. Flow affected by transmountain diversions, storage reservoirs, and diversions above station for irrigation of about 13,000 acres.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Dec. 1 to Jan. 31)

Oct. 1 to Nov. 30,  
Apr. 16 to Sept. 30

Dec. 1 to Apr. 15

0.2	44	0.4	49
.4	85	.7	85
.7	180	1.1	190
1.0	320		
1.5	610		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	109	57	52	51	62	123	207	370	326	189	93
2	51	98	63	51	49	62	128	261	402	256	159	76
3	53	101	64	49	49	57	125	266	397	225	132	104
4	51	107	55	51	49	62	136	270	397	220	107	115
5	51	101	50	48	49	62	115	234	326	243	98	162
6	51	90	50	*45	50	62	133	*189	342	212	90	194
7	53	104	50	44	52	62	*110	189	*342	194	90	*135
8	53	104	50	43	51	62	123	202	326	202	93	122
9	53	104	51	45	*50	62	130	202	300	189	93	115
10	55	109	49	46	50	62	146	225	300	173	*93	112
11	58	b100	48	45	50	62	157	280	280	*173	90	104
12	58	b98	48	43	51	70	152	331	270	173	93	90
13	60	96	50	45	54	*73	152	358	266	166	109	96
14	67	96	47	46	53	74	149	305	270	156	101	107
15	74	98	48	44	54	74	166	305	*280	156	90	104
16	78	b100	47	46	52	73	a180	315	295	162	96	101
17	78	b105	48	47	54	74	a180	331	353	162	138	88
18	*101	b110	50	46	53	74	a165	336	380	159	119	83
19	96	b105	49	47	55	74	a185	353	380	152	98	122
20	90	*b105	50	47	57	74	a200	392	386	159	88	202
21	90	b98	52	47	60	70	a210	408	280	261	90	216
22	90	b98	51	48	60	82	a200	414	442	280	93	336
23	88	b100	49	48	59	80	194	448	454	202	85	320
24	90	b110	50	48	62	85	142	*436	392	173	80	290
25	90	b120	48	48	62	98	115	408	370	189	83	238
26	85	b100	47	a50	59	100	107	414	331	173	96	300
27	88	b68	46	50	59	110	109	397	300	166	88	326
28	90	b70	44	51	62	112	128	397	275	152	78	320
29	96	b60	44	51	-	117	159	419	266	152	76	496
30	83	b66	43	51	-----	115	194	419	225	145	83	414
31	85	-----	44	50	-----	128	-----	397	-----	194	98	-----
Total	2,261	2,930	1,542	1,472	1,516	2,434	4,513	10,108	9,997	5,945	3,116	5,581
Mean	72.9	97.7	49.7	47.5	54.1	78.5	150	326	333	192	101	186
Ac-ft	4,480	5,810	3,060	2,920	3,010	4,830	8,950	20,050	19,830	11,790	6,180	11,070

Calendar year 1960: Max 1,120 Min 43 Mean 215 Ac-ft 155,700  
Water year 1960-61: Max 496 Min 43 Mean 141 Ac-ft 102,000

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

Note.--Discharge computed from twice-daily staff-gage readings Dec. 1 to Jan. 25, Jan. 27 to Apr. 15.

## LITTLE MUDDY CREEK BASIN

9-348. Little Muddy Creek near Parshall, Colo.

Location.--Lat 39°57'47", long 106°04'08", in NW¼ sec.13, T.1 S., R.78 W., on left bank at bridge 0.4 mile upstream from Sylvian Lake ditch headgate and 11.1 miles southeast of Parshall.

Drainage area.--6.50 sq mi.

Records available.--October 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,580 ft (from topographic map).

Extremes.--Maximum discharge during year, 28 cfs May 27 (gage height, 3.04 ft), from rating curve extended above 20 cfs; maximum gage height recorded, 4.89 ft Oct. 10 (backwater from beaver dam); minimum discharge not determined.  
1958-61: Maximum discharge, 61 cfs May 13, 1960 (gage height, 3.44 ft); maximum gage-height recorded, that of Oct. 10, 1960; minimum discharge not determined.

Remarks.--Records fair except those for periods of ice effect, no gage-height record, or backwater from beaver dam, which are poor.  
No diversion above station.

Rating table, water year 1960-61, except periods of ice effect or backwater from beaver dams  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 13-15, July 7-10, Sept. 20-30)

2.3	0	2.6	6.5
2.4	.5	2.7	11
2.5	3.0	2.9	22

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								b 4.0	1.6	1.3	1.8	0.1
2								b 5.1	1.4	1.1	.8	.2
3								*b 7.0	1.4	.9	.8	.5
4								b 6.6	1.4	1.0	.3	.8
5								6.2	1.2	1.2	2	1.8
6								4.8	1.1	.6	2	3.7
7								3.7	1.4	.2	2	3.7
8							0.3	4.4	*7.8	.4	.2	3.0
9								b 5.2	7.4	.2	2	2.8
10								b 6.8	6.5	*.5	.3	2.0
11								b 9.2	6.5	.4	.4	1.4
12								b 13	7.0	.5	.3	1.0
13								11	5.4	.4	.2	*.6
14								8.8	5.4	.3	*.1	.4
15								9.7	*4.8	.4	.1	.4
16	0.2							9.0	4.5	.3	2	.5
17		0.2						9.0	4.0	.2	2.5	1.2
18								10	4.0	.2	.5	1.0
19								*12	4.0	.2	2	2.2
20								14	4.0	.5	.1	2.2
21												
22								16	3.0	1.8	.1	2.5
23								17	2.5	1.0	.1	3.4
24								16	2.0	.3	.1	2.8
25								16	2.0	.2	.1	2.5
26								16	2.5	.2	.1	2.2
27								18	2.0	.2	.1	3.7
28								18	1.5	.2	.1	4.4
29								18	1.2	.1	.1	5.1
30								20	1.3	.1	.1	6.5
31								19	1.5	.2	.1	4.4
								17		2.8	2	
Total	6.2	6.0	6.2	3.1	2.8	9.3	27.0	350.5	185.8	17.9	10.8	67.0
Mean	0.2	0.2	0.2	0.1	0.1	0.3	0.9	11.3	6.19	0.58	0.35	2.23
Ac-ft	12	12	12	6.1	5.6	18	54	695	369	36	21	133

Calendar year 1960: Max 45 Min - Mean 3.47 Ac-ft 2,520

Water year 1960-61: Max 20 Min - Mean 1.90 Ac-ft 1,370

Peak discharge (base, 15 cfs).--May 27 (10 p.m.) 28 cfs (3.04 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 16 to Apr. 30 (stage-discharge relation affected by ice and beaver dam during part of period), Aug. 6-14, Sept. 11-13. Stage-discharge relation affected by backwater from beaver dam Oct. 1-15, June 13 to July 10, Sept. 20-30.

## WILLIAMS FORK BASIN

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9-360. Williams Fork near Leal, Colo.

Location.--Lat 39°49'55", long 106°03'20", in sec.31, T.2 S., R.77 W., on right bank at downstream side of private bridge, 100 ft downstream from Kinney Creek and 1.7 miles northwest of Leal.

Drainage area.--89.5 sq mi.

Records available.--July 1933 to September 1961. Records since May 10, 1940, equivalent to earlier records if diversion to Jones Pass tunnel is added to flow past station. Prior to October 1958, published as Williams River near Leal.

Gage.--Water-stage recorder. Altitude of gage is 8,790 ft (from topographic map). Prior to Aug. 16, 1953, at site 15 ft downstream at same datum.

Average discharge.--28 years, 103 cfs (74,570 acre-ft per year), including diversions to Jones Pass tunnel.

Extremes.--Maximum discharge during year, 676 cfs June 9 (gage height, 2.41 ft); minimum daily, 14 cfs Dec. 28-30, Jan. 2-4, 19-21.

1933-61: Maximum discharge, 1,720 cfs June 10, 1952 (gage height, 4.23 ft); minimum daily, 13 cfs Dec. 28, 29, 1939.

Remarks.--Records good except those for periods of ice effect or no gage height record, which are fair. Transmountain diversion above station from tributaries of Williams Fork through Jones Pass tunnel, then by way of Vasquez and Moffat water tunnels to South Boulder Creek in South Platte River basin (see table below). Diversions above station for irrigation of about 200 acres of hay meadows above station and about 40 acres below.

Month	Diversion in acre-feet	Month	Diversion in acre-feet
October.....	0	April.....	79
November.....	9.7	May.....	1,170
December.....	75	June.....	208
	- - - - -	July.....	1,490
Calendar year 1960....	2,610	August.....	1,040
	- - - - -	September.....	63
January.....	0		
February.....	56		
March.....	61	Water year 1960-61....	4,250

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.1	11	1.0	126
.2	17	1.5	256
.4	34	2.0	450
.7	73	2.5	730

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	30	22	16	b 17	16	16	44	441	170	85	45
2	27	31	22	b 14	b 17	16	16	55	436	148	78	42
3	27	32	22	b 14	b 17	16	17	62	375	162	70	51
4	27	31	22	b 14	b 17	16	17	66	313	146	59	63
5	26	28	20	b 15	b 17	16	16	53	288	148	56	78
6	25	32	20	*15	b 16	16	16	*44	292	122	52	92
7	25	31	21	15	b 16	16	16	40	317	120	51	100
8	26	27	21	15	b 16	16	15	40	*400	130	56	111
9	26	23	21	15	b 17	16	16	47	495	97	59	126
10	27	27	20	15	*b 17	16	16	75	522	*109	*55	128
11	28	28	19	15	18	16	16	102	516	95	50	111
12	28	29	19	15	18	16	*17	120	560	88	54	102
13	27	27	19	15	18	16	17	111	549	100	55	*95
14	30	27	19	15	17	16	16	82	505	102	56	92
15	30	25	19	16	17	16	16	73	*500	111	50	87
16	*30	25	16	16	17	18	16	73	480	104	52	87
17	30	24	17	15	18	19	18	75	511	95	69	87
18	31	24	18	15	17	16	23	83	516	92	59	85
19	30	25	18	14	b 16	16	28	*109	495	90	50	93
20	30	24	17	14	17	16	30	133	511	107	45	107
21	30	25	17	14	17	16	26	139	480	111	45	111
22	29	27	18	15	17	16	27	172	455	97	44	115
23	30	*23	18	15	17	17	30	190	413	73	40	115
24	30	24	17	15	17	19	24	188	387	72	40	111
25	30	24	16	16	17	18	23	175	354	70	49	104
26	30	23	16	16	17	17	22	193	328	66	47	113
27	30	23	16	15	b 15	*17	21	223	310	63	42	115
28	31	23	b 14	15	16	16	22	241	292	63	39	120
29	25	20	b 14	15	-	16	27	278	256	63	38	141
30	26	21	b 14	16	-----	16	35	362	185	67	40	124
31	33	-----	15	b 17	-----	16	-----	404	-----	93	50	-----
Total	879	783	567	467	473	509	615	4,057	12,482	3,174	1,635	2,951
Mean	28.4	26.1	18.3	15.1	16.9	16.4	20.5	131	416	102	52.7	98.4
Ac-ft	1,740	1,550	1,120	926	938	1,010	1,220	8,050	24,760	6,300	3,240	5,850

Calendar year 1960: Max 897 Min 14 Mean 99.6 Ac-ft 72,280  
 Water year 1960-61: Max 560 Min 14 Mean 78.3 Ac-ft 56,700

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 29 to Dec. 24, Jan. 16-30.

## WILLIAMS FORK BASIN

9-372. Skylark Creek near Parshall, Colo.

Location.--Lat 39°54'20", long 106°10'10", in NW $\frac{1}{4}$  sec.6, T.2 S., R.78 W., on left bank 4.3 miles upstream from mouth and 10.8 miles south of Parshall.

Drainage area.--2.41 sq mi.

Records available.--October 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,640 ft (from topographic map).

Extremes.--Maximum discharge during year, 7.9 cfs Sept. 24 (gage height, 1.03 ft), from rating curve extended above 2.1 cfs; minimum not determined.

1958-61: Maximum discharge not determined, occurred July 20, 1959 (gage height, 1.70 ft); minimum not determined.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 21 to May 17, June 13-20)

0.4	0.2	0.7	2.3
.5	.7	.8	3.5
.6	1.3	.9	4.9

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.5						0.8	3.3	1.0	0.5	0.3
2	.4	.4						.8	3.5	.8	.5	.3
3	.4	.4						1.0	3.7	.7	.5	.5
4	.4	.4						1.0	4.0	.6	.4	.5
5	.4							.8	3.6	.6	.4	.6
6	.5			(*)				*.6	3.5	.6	.3	.5
7	.5							.6	3.3	.6	.3	.5
8	.5							.8	3.5	.6	.3	.5
9	.5				(**)			.8	3.3	.6	.3	.5
10	.6						0.5	1.5	*3.6	*.5	*.4	.6
11	.6						(*)	2.5	3.5	.5	.3	.5
12	.6							2.7	3.2	.5	.3	.5
13	.6							2.2	3.1	.4	.3	*.5
14	.6							1.5	2.9	.4	.3	.5
15	.7							1.0	*2.7	.4	.3	.4
16	*.6		0.4	0.3	0.3	0.4		1.2	2.5	.4	.3	.4
17	.5	.4						1.8	2.4	.3	.4	.4
18	.5							1.7	2.2	.3	.3	.4
19	.5							*2.2	2.0	.3	.3	.6
20	.5						(*)	2.3	2.0	.4	.3	.7
21	.5						.5	2.0	1.7	.6	.3	.6
22	.4						.7	1.8	1.5	.5	.3	.7
23	.5	(*)					.5	1.8	1.4	.3	.3	1.2
24	.5						.5	1.8	1.3	.3	.3	3.1
25	.5						.5	1.8	1.2	.3	.3	1.5
26	.5						.5	1.8	1.2	.3	.3	1.0
27	.5						.5	1.8	1.1	.3	.3	.8
28	.5						.6	2.0	1.2	.3	.3	.8
29	.5						.7	2.3	1.0	.3	.2	1.0
30	.5						.7	2.8	1.0	.4	.3	1.1
31	.5							3.2		.5	.3	
Total	15.7	12.1	12.4	9.3	8.4	12.4	15.7	50.9	74.4	14.6	10.2	21.5
Mean	0.51	0.40	0.4	0.3	0.3	0.4	0.52	1.64	2.48	0.47	0.33	0.72
Ac-ft	31	24	25	18	17	25	31	101	148	29	20	43

Calendar year 1960: Max 2.9 Min - Mean 0.59 Ac-ft 429  
Water year 1960-61: Max 4.0 Min - Mean 0.71 Ac-ft 512

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.---No gage-height record Nov. 5 to Apr. 20 (stage-discharge relation affected by ice during most of period), July 9, 10, Aug. 8-10, Sept. 8-13.



9-375. Williams Fork near Parshall, Colo.

Location.--Lat 40°00'01", long 106°10'45", in SW $\frac{1}{4}$  sec.31, T.1 N., R.78 W., on right bank 150 ft downstream from bridge on State Highway 286,  $2\frac{1}{2}$  miles upstream from Battle Creek, and 4 miles south of Parshall.

Drainage area.--186 sq mi.

Records available.--July 1904 to September 1924, June 1933 to September 1961. Records since May 10, 1940, equivalent to earlier records if diversion to Jones Pass tunnel is added to flow past station. Published as "near (Hot) Sulphur Springs" 1904-12, and as "Williams River" June 1933 to September 1958.

Gage.--Water-stage recorder. Datum of gage is 7,805.00 ft above mean sea level, unadjusted. Prior to Oct. 18, 1919, staff gage and Oct. 18, 1919, to Sept. 30, 1924, water-stage recorder, at site  $1\frac{1}{2}$  miles downstream at different datum. June 19, 1933, to Aug. 8, 1938, water-stage recorder at bridge 150 ft upstream at datum 1.00 ft higher.

Average discharge.--48 years, 147 cfs (106,400 acre-ft per year), including diversion to Jones Pass tunnel.

Extremes.--Maximum discharge during year, 697 cfs June 2 (gage height, 3.77 ft); minimum daily, 20 cfs July 14. 1904-24, 1933-61: Maximum discharge observed, 2,620 cfs June 14, 1918 (gage height, 6.05 ft, site and datum then in use), from rating curve extended above 1,400 cfs; minimum daily, 10 cfs Sept. 15-17, 1934, Sept. 22, 23, 1959.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Transmountain diversion above station from tributaries of Williams Fork through Jones Pass tunnel, then by way of Vasquez and Moffat water tunnels to South Boulder Creek in South Platte River basin (see preceding page). Diversions above station for irrigation of about 1,300 acres (revised) above station and about 2,500 acres (revised) below. About 150 acres above station irrigated by diversions into the drainage area.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 19 to Sept. 30)

1.4	15	3.0	300
1.6	31	3.5	490
2.0	81	4.0	835
2.5	178		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	54	40	28	29	28	34	91	470	84	86	44
2	49	47	40	27	29	28	33	106	592	50	59	67
3	50	48	40	26	29	28	35	99	508	26	58	84
4	50	48	40	26	29	29	40	99	372	27	46	92
5	49	48	37	27	29	30	35	91	270	77	48	113
6	48	44	36	*28	28	30	35	*77	245	46	67	140
7	48	43	38	27	28	30	35	73	262	22	67	146
8	48	43	39	27	28	31	32	68	*330	26	67	150
9	48	40	38	27	28	32	30	75	392	*22	73	160
10	49	43	36	27	29	34	30	84	465	21	*70	165
11	50	45	35	27	29	34	28	101	450	24	63	148
12	52	46	35	27	29	32	*31	165	490	21	53	136
13	49	45	35	27	28	32	34	163	455	21	36	*128
14	52	44	35	27	*28	32	31	120	396	20	42	122
15	53	44	35	28	27	32	40	59	*372	23	30	116
16	*53	43	31	29	27	34	31	34	368	25	30	114
17	53	43	30	28	28	31	32	83	392	21	87	114
18	54	41	32	27	29	30	44	86	392	26	62	110
19	52	42	33	26	29	29	62	*97	351	33	46	126
20	50	43	32	25	27	29	74	148	364	47	38	148
21	49	40	31	25	27	29	59	148	348	83	42	150
22	49	43	32	26	28	*30	60	169	336	89	62	167
23	50	*43	33	27	28	30	71	189	315	68	58	163
24	50	41	31	27	28	34	59	146	285	58	55	160
25	49	41	30	28	27	33	49	146	255	55	60	144
26	48	40	30	29	27	32	44	148	227	58	58	163
27	50	39	29	28	27	31	46	198	209	58	54	167
28	50	38	27	28	27	35	44	207	196	54	44	176
29	50	37	26	28	-	35	55	238	185	52	23	202
30	47	37	26	28	-----	34	75	315	106	52	26	187
31	53	-----	27	28	-----	34	-----	380	-----	81	42	-----
Total	1,551	1,293	1,039	843	786	972	1,308	4,203	10,398	1,370	1,652	4,102
Mean	50.0	43.1	33.5	27.2	28.1	31.4	43.6	136	347	44.2	53.3	137
Ac-ft	3,080	2,560	2,060	1,670	1,560	1,930	2,590	8,340	20,620	2,720	3,280	8,140

Calendar year 1960: Max 820 Min 15 Mean 112 Ac-ft 81,100  
Water year 1960-61: Max 592 Min 20 Mean 80.9 Ac-ft 58,550

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 8-15, 21-23, Nov. 29 to Jan. 6, Jan. 25 to Feb. 14 (stage-discharge relation affected by ice during most of periods). Stage-discharge relation affected by ice Nov. 7, 16-20, 24-28, Jan. 7-24, Feb. 15 to Mar. 10, Mar. 13-26, 31.

## WILLIAMS FORK BASIN

9-380. Williams Fork Reservoir near Parshall, Colo.

Location--Lat 40°02'06", long 106°12'17", in SE $\frac{1}{4}$  sec. 23, T.1 N., R.79 W., at dam on Williams River, 2.1 miles upstream from mouth and 2.2 miles southwest of Parshall.

Drainage area--234 sq mi.

Records available--April 1939 to September 1961. Prior to October 1948, published in WSP 1313.

Gage--Mercury manometer gage read once daily. Datum of gage is at mean sea level (levels by city engineer of Denver). Prior to Sept. 2, 1959, tape-weight gage at same site and datum.

Extremes--Maximum contents observed during year, 85,630 acre-ft Oct. 1 (elevation, 7,803.73 ft); minimum observed, 38,410 acre-ft Apr. 17 (elevation, 7,761.85 ft).  
1939-61: Maximum contents observed, 94,350 acre-ft Aug. 1, 1960 (elevation, 7,809.46 ft); no contents Oct. 14 to Dec. 2, 1958, caused by construction operations at dam.

Remarks--Reservoir is formed by concrete-arch dam. Dam completed in October 1938; storage began in April 1939; dam was enlarged Dec. 5, 1956, to Apr. 22, 1959. Enlarged capacity of reservoir, 96,820 acre-ft between elevations 7,634 (invert of outlet pipes) and 7,811 ft (top of radial gates on spillway). No dead storage. Figures given herein represent usable contents. Reservoir is used for power development and storage for replacement of water diverted through Jones Pass tunnel (see records of diversion published with records for Williams Fork near Leal) during periods when flow of Colorado River is insufficient to supply decreed prior water rights below Williams Fork.

Cooperation--Records furnished by Denver Board of Water Commissioners.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	7,803.80	85,730	-
Oct. 31.....	7,801.25	82,070	-3,660
Nov. 30.....	7,798.35	78,050	-4,020
Dec. 31.....	7,790.90	68,340	-9,710
Calendar year 1960.....	-	-	+26,020
Jan. 31.....	7,778.44	54,120	-14,220
Feb. 28.....	7,767.42	43,330	-10,790
Mar. 31.....	7,762.38	38,860	-4,470
Apr. 30.....	7,762.10	38,620	-240
May 31.....	7,771.20	46,860	+8,240
June 30.....	7,791.10	68,590	+21,730
July 31.....	7,791.71	69,350	+760
Aug. 31.....	7,790.00	67,220	-2,130
Sept. 30.....	7,792.20	69,970	+2,750
Water year 1960-61.....	-	-	-15,760

† Elevation at 8 a.m.

9-385. Williams Fork below Williams Fork Reservoir, Colo.

Location.--Lat 40°02'07", long 106°12'17", in SE $\frac{1}{4}$  sec.23, T.1 N., R.79 W., on left bank 400 ft downstream from Williams Fork Reservoir, 2.1 miles upstream from mouth, and 2.1 miles southwest of Parshall.

Drainage area.--234 sq mi.

Records available.--October 1948 to September 1954, August 1958 to September 1961. Prior to October 1958, published as "Williams River."

Gage.--Water-stage recorder and concrete control. Datum of gage is 7,615.0 ft above mean sea level (datum of Denver Board of Water Commissioners). Oct. 1, 1948, to Sept. 30, 1954, at site a quarter of a mile downstream at different datum. Aug. 1, 1958, to Oct. 20, 1959, at site half a mile downstream at different datum.

Average discharge.--9 years, 131 cfs (94,840 acre-ft per year), adjusted for storage in Williams Fork Reservoir.

Extremes.--Maximum discharge during year, 291 cfs Feb. 1 (gage height, 2.63 ft); minimum daily, 1.4 cfs Aug. 6.

1948-54, 1958-61: Maximum discharge, 2,640 cfs June 20, 1953 (gage height, 8.50 ft, site and datum then in use), from rating curve extended above 1,500 cfs; minimum daily recorded, 0.5 cfs Apr. 30 to May 3, 1959.

Remarks.--Records excellent. Flow regulated by Williams Fork Reservoir (see preceding page). Transmountain diversion above station from tributaries of Williams Fork through Jones Pass tunnel, then by way of Vasquez and Moffat water tunnels to South Boulder Creek in South Platte River basin (see records of diversion published with records for Williams Fork near Leal). Diversions above station for irrigation of about 3,200 acres above station and about 100 acres below. About 450 acres above station irrigated by diversion into the drainage area.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.2	1.0	1.0	30
.3	1.5	1.2	51
.5	4.3	1.5	94
.7	10	2.0	178
.8	15	2.8	325

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	131	130	a 253	272	211	3.1	87	13	9.5	100	121
2	71	130	145	a 253	271	211	3.1	87	12	9.3	100	151
3	129	128	131	a 253	272	205	115	87	12	9.3	99	151
4	129	129	129	a 253	235	115	115	87	12	9.3	99	152
5	130	70	126	a 253	236	115	115	85	12	23	1.9	154
6	130	72	131	*a 253	236	115	115	*3.4	13	81	1.4	155
7	129	130	129	253	236	115	115	3.1	*13	78	45	157
8	67	131	137	253	240	116	3.1	3.4	12	78	98	*153
9	69	128	135	253	*242	116	3.1	4.3	13	80	98	10
10	128	129	134	253	242	116	65	13	13	71	*99	10
11	126	128	138	254	242	116	65	5.6	13	80	94	143
12	128	72	132	256	242	115	*65	5.6	13	78	95	142
13	130	66	134	256	242	*115	65	5.6	13	78	96	144
14	129	129	131	256	242	115	65	5.6	13	78	99	142
15	69	130	176	256	244	115	65	5.6	13	78	97	146
16	69	131	245	256	244	115	65	5.6	10	78	115	144
17	127	131	245	256	243	115	65	5.6	9.3	78	116	142
18	128	130	245	258	204	115	65	5.6	9.3	79	118	140
19	127	72	245	260	204	115	65	5.6	9.3	80	119	140
20	129	72	247	262	204	115	65	6.1	3.6	78	119	138
21	129	130	249	262	206	115	65	8.3	8.9	78	119	140
22	74	129	249	262	208	115	87	8.3	9.3	78	119	140
23	70	*134	249	262	208	115	87	8.3	9.3	77	121	4.6
24	129	74	249	263	208	115	87	3.6	8.9	76	122	4.6
25	129	134	249	265	208	3.1	85	3.6	8.9	77	120	129
26	129	72	249	265	208	3.1	87	3.6	3.6	79	120	139
27	*130	73	249	263	209	115	87	3.6	3.6	77	122	139
28	130	130	251	265	211	115	89	3.6	3.6	79	124	139
29	73	127	a 251	267	-	115	89	3.6	3.6	100	120	137
30	74	129	a 251	267	-----	115	87	3.6	3.9	100	125	4.2
31	131	-----	a 251	271	-----	115	-----	11	-----	100	125	-----
Total	3,414	3,371	6,012	8,012	6,459	3,627.2	21,544	612.8	3,251	21,592	31,473	3,515.4
Mean	110	112	194	258	231	117	71.8	19.8	10.8	69.7	102	121
Ac-ft	6,770	6,690	11,920	15,890	12,810	7,190	4,270	1,220	645	4,280	6,240	7,170

Calendar year 1960: Max 251 Min 2.4 Mean 90.9 Ac-ft 66,000  
 Water year 1960-61: Max 272 Min 1.4 Mean 118 Ac-ft 85,100

\* Discharge measurement made on this day.

a No gage-height record.

## TROUBLESOME CREEK BASIN

9-390. Troublesome Creek near Pearmont, Colo.

Location---Lat 40°13'03", long 106°18'45", in SE $\frac{1}{4}$  sec. 14, T.3 N., R.80 W., on left bank 45 ft downstream from small tributary, 3 miles north of Pearmont, 4 miles downstream from Rabbit Ear Creek,  $\frac{5}{8}$  miles upstream from East Fork, and 12 miles northeast of Kremmling.

Drainage area---44.6 sq mi.

Records available---October 1953 to September 1961.

Gage---Water-stage recorder. Altitude of gage is 8,049 ft (from topographic map).

Average discharge---8 years, 27.9 cfs (20,200 acre-ft per year).

Extremes---Maximum discharge during year, 134 cfs May 31 (gage height, 1.83 ft); maximum gage height, 2.98 ft Mar. 23 (backwater from beaver dam); minimum discharge not determined.

1953-61: Maximum discharge, 503 cfs June 7, 1957 (gage height, 3.48 ft); minimum daily, 6.1 cfs Sept. 8, 1956.

Remarks---Records good except those for periods of ice effect or backwater from beaver dams, which are poor. One diversion above station for irrigation of about 250 acres below. Flow partly regulated during irrigation season by one reservoir (capacity, 1,070 acre-ft) above station.

Rating table, water year 1960-61, except periods of ice effect or backwater from beaver dam  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 27 to June 15)

0.8	10	1.4	58
1.0	21	1.7	96
1.2	37	2.1	158

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	15					13	25	116	36	17	14
2	15	14					15	27	112	37	17	14
3	20	13					17	27	107	38	17	14
4	19	14					19	*28	100	38	15	15
5	19	14					18	31	92	38	14	17
6	20	12					18	23	88	38	12	18
7	21	14			(*)		14	23	*84	38	13	*18
8	21	14					13	25	82	38	12	16
9	22	14					13	41	80	*37	*13	16
10	22	15					*12	46	79	35	12	16
11	23	14					13	50	76	35	12	14
12	23	13					12	57	71	33	12	14
13	23	12					14	55	65	32	13	14
14	25	12			(*)	(*)	15	48	*59	31	12	13
15	24	13					10	46	55	29	12	13
16	24	11	11	9	9	11	10	45	50	27	12	14
17	25	12					11	43	46	27	12	17
18	24	11					12	*44	46	26	12	16
19	22	12					18	49	46	25	11	18
20	21	13					17	56	47	26	11	20
21	19	12					14	52	44	28	14	20
22	18	*11					16	57	43	27	12	21
23	17	11					15	63	41	26	12	20
24	15	11					14	65	39	24	10	19
25	15	11					13	66	39	24	13	17
26	*14	11					13	73	39	20	18	19
27	14	11					13	74	37	19	14	20
28	14	10					14	95	37	18	13	21
29	14	10					15	100	37	16	12	26
30	13	11					19	114	36	16	12	27
31	14							113		15	15	
Total	596	371	341	279	252	341	430	1,666	1,893	897	406	521
Mean	19.2	12.4	11	9	9	11	14.3	53.7	63.1	28.9	13.1	17.4
Ac-ft	1,180	736	676	553	500	676	853	3,300	3,750	1,780	805	1,030

Calendar year 1960: Max 156 Min - Mean 29.3 Ac-ft 21,300

Water year 1960-61: Max 118 Min - Mean 21.9 Ac-ft 15,840

\* Discharge measurement made on this day.

Note---Stage-discharge relation affected by ice or backwater from beaver dam Oct. 1 to Apr. 30.



9-400. East Fork Troublesome Creek near Troublesome, Colo.

Location.--Lat 40°09'27", long 106°16'58", in NW¼ sec. 7, T.2 N., R.79 W., on right bank 300 ft upstream from mouth and 6½ miles north of Troublesome.

Drainage area.--81.4 sq mi.

Records available.--April 1937 to September 1943, October 1953 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 7,670 ft (from topographic map). Apr. 18, 1937, to May 13, 1941, staff gage at site 100 ft upstream at different datum. May 13 to Aug. 8, 1941, staff gage and Aug. 8, 1941, to Sept. 30, 1943, chain gage, at same site at different datum. Datum differences for all sites not more than 0.4 ft.

Average discharge.--14 years, 26.7 cfs (19,330 acre-ft per year).

Extremes.--Maximum discharge during year, 161 cfs May 22 (gage height, 3.32 ft); minimum not determined.

1937-43, 1953-61: Maximum discharge, 716 cfs June 6, 1957 (gage height, 5.19 ft); minimum daily, 0.2 cfs Oct. 3, 1941, Sept. 2, 3, 26, 27, 1942.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	1.6	2.2	22
1.7	2.6	2.4	41
1.8	4.2	2.7	76
2.0	10	3.0	118
2.1	15	3.5	201

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	6.3	5.0	4.5			3.7	5.4	123	22	4.5	6.3
2	5.2	5.2	5.2				3.7	6.9	115	17	4.5	6.0
3	5.2	6.3	5.2				9.0	7.4	109	14	4.7	9.4
4	5.2	6.3	5.2				13	*6.5	96	12	3.2	1.0
5	5.5	5.3	5.2				9.4	4.4	82	10	3.1	1.1
6	5.5	5.2	5.0				3.4	3.6	77	9.0	2.3	1.3
7	5.5	6.3	4.7	(*)		6.5	3.1	3.3	*72	3.7	2.4	*1.2
8	5.5	7.1	4.7				9.0	3.1	71	9.0	2.3	1.0
9	5.3	6.5	4.9				3.1	3.6	70	*3.7	*2.4	1.0
10	6.3	3.1	5.0				3.1	6.4	70	3.4	2.2	9.7
11	6.5	7.1	5.2				6.3	10.4	66	3.7	2.0	9.4
12	7.1	7.1	5.2				*6.3	11.2	60	3.7	2.1	9
13	7.1	6.3	5.2				3.1	9.7	5.4	7.3	2.3	7.1
14	9.7	6.5	5.1				7.4	7.5	*4.9	6.3	2.3	6.3
15	9.4	6.3	4.3			5.2	7.3	6.5	4.5	6.5	2.3	5.3
16	3.7	7.4	4.7	4.0		6.5	7.4	6.4	4.2	7.1	2.0	5.5
17	11	7.3	4.3			7.1	3.1	5.3	3.6	6.3	3.3	5.3
18	10	3.4	5.4			6.3	1.4	*6.9	3.3	5.3	5.0	6.3
19	9.0	5.3	5.0			5.3	2.9	3.9	3.2	4.7	2.3	1.0
20	3.4	3.1	5.3			6.3	4.0	11.5	4.0	4.5	2.1	1.4
21	7.4	6.3	5.3			5.3	2.7	13.6	3.2	3.7	2.3	1.4
22	7.1	*5.2	5.4			*5.0	2.4	14.0	2.7	9.4	3.3	2.1
23	6.5	6.3	5.2			6.3	3.5	14.0	2.5	6.3	2.5	1.6
24	6.5	5.3	5.0			7.3	2.1	13.7	2.5	5.0	2.0	1.4
25	5.3	5.2	5.0			3.7	1.5	12.3	2.5	4.7	2.1	1.2
26	*5.2	5.0	5.0			7.4	1.5	12.1	2.1	4.2	9.0	1.4
27	5.0	5.0	5.0			6.3	1.4	12.0	2.0	3.9	6.3	1.3
28	5.2	5.2	4.7			6.0	1.4	12.6	2.0	4.0	3.2	2.6
29	5.2	4.7	4.7			6.0	2.7	12.6	1.3	3.7	2.5	4.6
30	5.3	4.7	4.5			6.0	4.2	13.4	1.3	3.2	2.3	4.3
31	6.0		4.5			7.1		12.3		3.1	5.2	
Total	206.5	190.3	156.7	124.5	145.6	202.9	460.4	2,791	1,573	241.9	101.4	400.6
Mean	6.66	6.34	5.05	4.02	5.2	6.55	15.3	90.0	52.4	7.80	3.27	13.4
Ac-ft	410	377	311	247	289	402	913	5,540	3,120	480	201	795

Calendar year 1960: Max 218 Min 2.3 Mean 29.7 Ac-ft 21,570  
 Water year 1960-61: Max 140 Min - Mean 18.1 Ac-ft 13,080

Peak discharge (base, 170 cfs)--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 27 to Dec. 1, Dec. 9-24. No gage-height record Jan. 2 to Mar. 14 (stage-discharge relation affected by ice during most of period).

## MUDDY CREEK BASIN

9-410. Muddy Creek near Kremmling, Colo.

Location.--Lat 40°17'37", long 106°28'59" in SE $\frac{1}{4}$  sec.20, T.4 N., R.81 W., on left bank a quarter of a mile upstream from Lindsey Creek, half a mile upstream from bridge on U. S. Highway 40, 3 miles downstream from Albert Creek, and 17 miles northwest of Kremmling.

Drainage area.--74.2 sq mi.

Records available.--September 1937 to September 1943, October 1955 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 7,856 ft (from topographic map). September 1937 to Sept. 30, 1943, staff gage at site 3 miles upstream at different datum.

Average discharge.--12 years, 52.0 cfs (37,650 acre-ft per year).

Extremes.--Maximum discharge during year, 452 cfs May 28 (gage height, 4.99 ft); minimum not determined.

1937-43, 1955-61: Maximum discharge, 992 cfs May 9, 1957 (gage height, 6.46 ft); minimum daily, 0.1 cfs Aug. 19, 24, 1940.

Remarks.--Records good except those for periods of ice effect, backwater from beaver dam, or no gage-height record, which are poor. Some regulation by Barber Reservoir (capacity, 4,290 acre-ft). Diversions for irrigation of about 900 acres above station.

Rating tables, water year 1960-61, except periods of ice effect  
or backwater from beaver dam  
(gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

2.7	2.7	2.6	3.0	3.2	32
2.8	3.2	2.7	4.1	3.5	69
3.0	13	2.8	6.8	4.0	150
		3.0	16	5.0	455

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	5.3					3.0	1.10	3.02	3.0	6.3	5.7
2	2.7	6.3					4.0	*1.34	2.57	2.5	6.4	4.1
3	4.0	5.0					5.0	1.52	2.33	2.2	9.5	6.5
4	2.7	5.0					5.4	1.43	2.06	2.1	7.4	7.5
5	2.7	5.0					*4.5	1.33	2.00	2.6	6.0	7.4
6	2.7	5.2					4.0	1.17	1.70	2.3	4.9	11
7	2.7	6.3		(*)			3.5	1.04	*1.73	2.2	4.0	7.4
8	2.7	7.4					3.5	9.2	1.63	*1.3	*3.7	5.4
9	2.7	5.0					3.5	9.5	1.55	1.6	3.4	4.9
10	2.7	5.0					4.0	1.34	1.42	1.5	3.4	5.2
11	4.7	6.4					4.0	2.09	1.23	1.5	3.0	4.6
12	5.0	6.4					4.5	2.81	1.17	1.4	3.4	3.9
13	4.7	7.0					4.5	2.69	1.05	1.2	3.9	*3.6
14	5.2	6.4					5.6	1.95	*9.4	1.1	4.0	3.3
15	6.4	5.0					4.5	1.72	8.7	1.0	3.7	3.4
16	6.3	5.0	5	4.5	(*) 5		4.0	1.52	8.0	3.4	3.3	3.4
17	7.0	5.0					6.0	1.73	6.3	7.4	4.4	9.5
18	7.0	4.5					8.7	*1.80	6.0	9.2	3.4	11
19	*7.0	7.0					9.2	1.95	5.9	8.2	3.4	11
20	6.3	8.4					7.5	2.51	5.9	8.5	3.0	1.5
21	5.9	5.4					5.3	2.84	5.2	1.9	3.1	2.6
22	5.4	*5.0					*6.0	3.32	4.4	2.0	3.2	3.9
23	5.4	5.2					6.3	3.71	3.5	1.5	3.0	3.1
24	5.2	6.4					4.7	3.44	3.5	1.3	3.1	2.7
25	5.2	7.4					3.9	3.44	3.9	1.1	3.4	2.0
26	5.2	7.7					3.5	3.57	3.5	1.0	6.0	2.5
27	5.2	7.7					3.3	3.44	3.0	8.5	7.1	3.6
28	5.0	7.4					4.3	3.92	2.8	8.2	4.1	4.1
29	5.0	5.4					6.0	3.47	3.0	8.5	3.7	6.4
30	4.7	5.2					8.6	3.74	3.5	8.5	3.6	4.3
31	5.0							3.14		7.5	4.9	
Total	154.4	194.7	155	139.5	140	218	151.4	71.45	32.31	451.7	139.2	491.2
Mean	4.98	6.49	5	4.5	5	7	50.5	230	108	14.6	4.49	16.4
Ac-ft	306	386	307	277	278	432	3,000	14,170	6,410	896	276	974

Calendar year 1960: Max 398 Min 2.2 Mean 57.9 Ac-ft 42,030  
Water year 1960-61: Max 392 Min - Mean 38.3 Ac-ft 27,710

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-12	10:30p.m.	4.70	350	5-28	5:30a.m.	4.99	452
5-23	3:30a.m.	4.88	413				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 8-14. No gage-height record Nov. 29 to Dec. 7, Dec. 15 to Apr. 17 (stage-discharge relation affected by ice during part of periods). Backwater from beaver dam Aug. 15 to Sept. 30.

MUDDY CREEK BASIN

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9-411. Antelope Creek near Kremmling, Colo.

Location.--Lat 40°14'26", long 106°22'23", in N½ sec.8, T.3 N., R.80 W., on right bank 5.8 miles upstream from mouth and 12½ miles north of Kremmling.

Drainage area.--10.6 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,933 ft (from topographic map).

Average discharge.--6 years, 2.17 cfs (1,570 acre-ft per year).

Extremes.--Maximum discharge during year, 16 cfs May 11 (gage height, 1.77 ft); minimum not determined.

1955-61: Maximum discharge, 148 cfs Mar. 27, 1960 (gage height, 2.70 ft, from floodmarks), by slope-area measurement of peak flow; minimum daily determined, 0.1 cfs Aug. 11, 12, 14, 1956.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No diversion or regulation above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 19-22, Aug. 10 to Sept. 30)

0.9	0.2	1.3	2.8
1.0	.4	1.5	7.0
1.1	.8	1.7	13
1.2	1.6		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0.4					1.4	4.4	3.4	0.6	0.3	0.3
2	.8	.4					1.6	*5.9	2.8	.4	.3	.5
3	.8	.6					1.8	6.3	2.7	.4	.3	.7
4	.8	.5					2.0	5.2	2.8	.4	.2	.7
5	.8	.5					1.4	4.2	2.4	.4	.2	.7
6	.8	.6					*1.4	2.8	2.6	.4	.2	.6
7	.8	.6					1.4	2.8	*2.1	.4	.2	.6
8	.8	.5					1.2	2.6	1.8	*.4	.3	*.4
9	.7	.4					1.1	3.4	1.6	.2	*.3	.4
10	.7	.4		(*)			1.1	6.3	1.4	.2	.2	.4
11	.7	.5					1.1	9.1	1.4	.2	.2	.4
12	.7	.6					1.3	9.4	1.3	.2	.2	.3
13	.6	.7					1.4	6.8	1.1	.3	.3	.4
14	.6	.6			(*)	(*)	1.2	4.8	*1.0	.2	.2	.4
15	.5	.6					1.2	4.2	1.0	.3	.2	.5
16	.5	.6	0.4	0.3	0.5	0.7	1.6	4.6	1.0	.2	.2	.6
17	.5	.6					2.0	*4.0	.9	.2	.3	1.0
18	.5	.6					2.7	4.8	.9	.2	.2	.7
19	*.5	.6					4.6	5.9	.9	.2	.2	1.0
20	.5	.6					4.6	7.6	1.2	.3	.2	.9
21	.5	.6					2.7	8.5	.8	.6	.3	1.4
22	.5	*.8					*3.6	8.5	.7	.4	.3	1.5
23	.5	.6					2.6	7.6	.6	.2	.2	1.2
24	.5	.6					2.1	6.3	.6	.2	.2	1.1
25	.5	.6					1.7	6.3	.6	.3	.6	1.0
26	.4	.5					1.7	7.3	.6	.3	.6	1.4
27	.5	.5					1.6	6.1	.6	.2	.4	1.4
28	.4	.4					1.8	5.5	.5	.2	.2	1.4
29	.4	.4					2.3	5.0	.5	.2	.2	1.8
30	.4	.4					3.6	4.4	.6	.2	.3	1.4
31	.3							3.8		.2	.3	
Total	18.2	16.1	12.4	9.3	14.0	21.7	59.8	174.4	40.4	9.1	8.3	25.1
Mean	0.59	0.54	0.4	0.3	0.5	0.7	1.99	5.63	1.35	0.29	0.27	0.84
Ac-ft	36	32	25	18	28	43	119	346	80	18	16	50

Calendar year 1960: Max 35 Min - Mean 2.04 Ac-ft 1,480  
Water year 1960-61: Max 9.4 Min - Mean 1.12 Ac-ft 811

Peak discharge (base, 15 cfs)--May 11 (10:30 p.m.) 16 cfs (1.77 ft); May 26 (2:30 p.m.) 15 cfs (1.75 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31 to Nov. 2, Nov. 9-27, Apr. 15. No gage-height record Nov. 28 to Apr. 6 (stage-discharge relation affected by ice during most of period), July 9-20, 23-31, Aug. 4-9, 15, 20, 24.

## MUDDY CREEK BASIN

9-412. Red Dirt Creek near Kremmling, Colo.

Location.--Lat 40°09'41", long 106°33'32", in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.10, T.2 N., R.82 W., on left bank three-quarters of a mile upstream from Snow Shoe Ranch, 2 miles downstream from McMahon (Red Dirt) Reservoir, 9 $\frac{1}{4}$  miles upstream from mouth, and 11 $\frac{1}{2}$  miles northwest of Kremmling.

Drainage area.--18.3 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,961 ft (from topographic map).

Average discharge.--6 years, 20.9 cfs (15,130 acre-ft per year).

Extremes.--Maximum discharge during year, 157 cfs June 2 (gage height, 2.28 ft); minimum not determined.  
1955-61: Maximum discharge, 343 cfs June 13, 1957 (gage height, 3.01 ft); minimum not determined.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station. Flow regulated by McMahon (Red Dirt) Reservoir (capacity, about 4,500 acre-ft). A small amount of water is imported from the Yampa River basin to McMahon Reservoir.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.6	3.2	1.5	36
.8	5.9	1.8	65
1.0	10	2.1	117
1.2	17	2.4	186

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	3.9						19	83	43	21	9.5
2	3.2	3.8						*19	150	43	21	9.5
3	7.9	3.9						21	141	43	21	10
4	7.7	5.0						21	132	43	21	10
5	7.7	4.6						19	119	43	21	10
6	7.7	4.7						17	*109	42	20	9.5
7	7.7	4.7						15	97	42	11	*9.5
8	7.5	4.6						15	92	*42	4.7	10
9	7.5	4.0						23	85	42	*4.6	10
10	7.5	3.7						25	80	42	4.4	9.5
11	7.5							31	76	43	4.4	9.5
12	7.5							34	63	43	4.6	9.5
13	7.5							26	54	49	4.4	9.5
14	7.5							24	50	49	4.3	9.5
15	7.4							25	48	48	4.3	9.5
16	7.4							25	47	48	4.4	9.5
17	7.3							25	*47	43	4.4	9.5
18	7.3							*27	43	47	4.3	9.5
19	*7.3							27	47	47	4.2	10
20	7.2							25	47	37	4.2	10
21	7.0	2.5						23	46	26	4.2	12
22	7.0	(*)						30	46	25	4.2	12
23	6.8							30	45	19	4.2	11
24	6.6							30	45	16	4.3	11
25	6.4							32	45	20	4.4	11
26	6.3							34	45	20	4.4	11
27	6.1							35	45	21	4.2	12
28	5.9							35	44	22	4.0	12
29	6.1							37	44	22	4.0	12
30	5.0							42	44	21	4.3	12
31	4.7							41	-----	21	6.4	-----
Total	220.5	92.9	62	62	70	93	150	837	2,069	1,122	241.8	312.6
Mean	7.11	3.10	2	2	2.5	3	5	27.0	69.0	36.2	7.80	10.4
Ac-ft	437	184	123	123	139	184	298	1,660	4,100	2,230	480	620

Calendar year 1960: Max 160 Min - Mean 20.6 Ac-ft 14,940

Water year 1960-61: Max 150 Min - Mean 14.6 Ac-ft 10,580

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 12-18, Nov. 9 to May 2 (stage-discharge relation affected by ice during part of period).



9-413. Pass Creek near Kremmling, Colo.

Location.--Lat 40°08'00", long 106°29'20", in NW 1/4 sec. 20, T.2 N., R.81 W., on left bank half a mile downstream from Burke Spring Creek, 6 miles upstream from mouth, and 7 1/2 miles northwest of Kremmling.

Drainage area.--17.8 sq mi.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,840 ft (from topographic map).

Extremes.--Maximum discharge during year, 68 cfs May 21 (gage height, 2.92 ft); maximum gage height recorded, 3.25 ft Dec. 13 (backwater from ice); minimum discharge not determined.

1957-61: Maximum discharge, 107 cfs May 22, 1958 (gage height, 3.16 ft), from rating curve extended above 64 cfs; maximum gage height recorded, that of Dec. 13, 1960; minimum daily discharge, 0.6 cfs Aug. 2, 8, 12-14, 1958.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Some regulation by small reservoir on Spring Creek above station. Several small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	3.2					4.5	21	2.7	2.8	2.0	3.2
2	2.7	3.5					5.0	*2.4	2.7	2.7	2.4	2.7
3	2.7	3.2					6.0	2.6	2.4	2.2	2.7	4.2
4	2.7	3.2					7.0	2.6	2.3	2.2	1.6	4.0
5	2.8	2.8					*5.8	2.3	2.0	2.2	1.1	5.2
6	3.0	3.0					4.7	1.7	2.2	2.0	1.1	5.2
7	2.9	3.2		(*)			3.5	1.5	*2.1	2.0	1.2	*4.4
8	2.9	3.0					2.8	1.5	1.8	*1.9	*1.4	3.7
9	2.9	3.0					3.0	2.0	1.6	1.7	1.4	3.2
10	2.9	2.9					3.0	2.6	*1.6	1.6	1.4	2.8
11	3.6	3.5					2.5	3.4	1.3	1.4	1.7	2.7
12	3.5	3.5					3.5	3.9	1.2	1.6	2.7	2.5
13	3.5	3.8					4.2	3.9	1.7	1.4	3.0	2.7
14	3.7	3.8					2.7	3.5	*1.5	1.3	2.5	3.0
15	4.5	3.5			(*)		2.7	3.5	1.5	1.3	2.0	2.8
16	4.0	3.3	3	2	2.5	3	3.0	3.6	1.5	1.4	1.9	2.7
17	4.0	3.3					4.7	3.4	1.3	1.9	2.5	4.4
18	4.0	3.5					9.7	*3.9	1.1	1.7	2.2	3.5
19	*3.9	3.2					2.4	5.1	1.0	1.6	1.6	5.2
20	4.0	3.3					3.4	5.7	9.7	1.9	2.0	5.2
21	4.0	*3.0					1.5	6.1	7.6	4.0	2.4	7.2
22	4.0	2.7				(*)	*1.5	5.9	5.8	3.0	1.9	9.7
23	4.0	2.9					1.2	5.2	3.7	2.0	1.6	7.9
24	3.7	3.0					8.3	5.0	4.0	1.7	1.4	7.2
25	3.5	3.1					6.8	5.4	4.0	1.7	1.7	6.8
26	3.2	3.3					5.4	5.4	3.2	2.2	3.7	8.6
27	3.2	3.5					6.5	5.0	2.8	2.5	2.4	9.7
28	3.5	3.1					8.6	4.6	2.8	2.2	1.9	1.3
29	3.0	2.7					1.3	3.9	2.7	2.0	1.4	2.0
30	3.0	3.0					1.7	3.6	2.7	2.0	2.4	1.4
31	3.0	-----			-----		-----	2.9	-----	1.9	4.4	-----
Total	104.9	96.0	93	62	70.0	93	243.9	114.2	385.0	62.0	63.6	176.4
Mean	3.38	3.20	3	2	2.5	3	8.13	36.8	12.8	2.00	2.05	5.88
Ac-ft	208	190	184	123	139	184	484	2,270	764	123	126	350

Calendar year 1960: Max 62 Min 1.2 Mean 8.76 Ac-ft 6,370  
 Water year 1960-61: Max 61 Min - Mean 7.10 Ac-ft 5,140

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 6, 9-18, 20, 21, 23, Nov. 25 to Dec. 13. No gage-height record Oct. 1-19, Dec. 14 to Apr. 5 (stage-discharge relation affected by ice during most of period).

## BLUE RIVER BASIN

9-429. Monte Cristo diversion near Hoosier Pass, Colo.

Location.--Lat 39°22'50", long 106°04'10", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.2, T.8 S., R.78 W., on left bank at entrance to Hoosier Pass tunnel, 2,000 ft downstream from diversion point,  $\frac{1}{2}$  miles northwest of Hoosier Pass, and 7 miles southwest of Breckenridge.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 10,986 ft (from State engineer).

Extremes.--1957-61: Maximum daily discharge, 66 cfs June 15, 1959; no flow for most of each year.

Remarks.--Records good except those for period of no gage-height record, which are poor. This is a transmountain diversion from Monte Cristo Creek in Blue River basin through Hoosier Pass tunnel to South Platte River basin whence it is again diverted to South Catamount Creek (revised) in the Arkansas River basin. Water is for municipal use by city of Colorado Springs. Diversion point is in SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.2, T.8 S., R.78 W. The entire flow is regulated by diversion gates.

Cooperation.--Gage-height record furnished by city of Colorado Springs.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								0	34	24		0
2								0	33	23		0
3								0	20	20	(*)	0
4								.2	14	20		0
5								.6	*12	13		0
6								.5	11	*3		0
7								.5	13	0		0
8								.6	21	0		0
9								.8	37	0		0
10								1.1	41	0		0
11								4.0	36	0		4.1
12								4.5	35	0		15
13								3.0	29	0		13
14								2.0	32	0		11
15								1.6	33	0		9.1
16								4.3	35	0		8.5
17								4.8	40	0		8.1
18								7.1	38	0		8.3
19								9.3	38	0		8.9
20								9.1	40	0		8.9
21								10	40	0		8.7
22								16	36	0		8.5
23								20	31	0		8.1
24								21	30	0		7.5
25								17	29	0		6.9
26								18	27	0		6.5
27								20	26	0		6.1
28								28	29	0		6.1
29								27	26	0		6.3
30								32	24	0		5.9
31		-----			-----		-----	33	-----	0		-----
Total	0	0	0	0	0	0	0	296.0	890	100.3	0	165.5
Mean	0	0	0	0	0	0	0	9.55	29.7	3.24	0	5.52
Ac-ft	0	0	0	0	0	0	0	587	1,770	199	0	328

Calendar year 1960: Max 63 Min 0 Mean 5.53 Ac-ft 4,010

Water year 1960-61: Max 41 Min 0 Mean 3.98 Ac-ft 2,880

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record May 4-15.

9-443. Bemrose-Hoosier diversion near Hoosier Pass, Colo.

Location.--Lat 39°22'50", long 106°04'10", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.2, T.8 S., R.78 W., on right bank at entrance to Hoosier Pass tunnel,  $1\frac{1}{2}$  miles northwest of Hoosier Pass, about 2 miles downstream from diversion point on Bemrose Creek, and 7 miles southwest of Breckenridge.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 10,986 ft (from State engineer).

Extremes.--1957-61: Maximum daily discharge, 40 cfs May 27, 1958; no flow for most of each year.

Remarks.--Records good. This is a transmountain diversion from Bemrose and Hoosier Creeks in Blue River basin through Hoosier Pass tunnel to South Platte River basin whence it is again diverted to South Catamount Creek (revised) in the Arkansas River basin. Water is for municipal use by city of Colorado Springs. Diversion points are in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.6, T.8 S., R.77 W., and in sec.12, T.8 S., R.78 W. The entire flow is regulated by diversion gates.

Cooperation.--Gage-height record furnished by city of Colorado Springs.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								0	12	7.3		0
2								0	12	6.9		0
3								0	8.9	6.2		0
4								.2	8.9	6.0		0
5								.4	*8.9	3.9		0
6								.4	9.2	*.2		0
7								.4	10	0		0
8								.4	14	0		0
9								.4	16	0		0
10								.5	15	0		0
11								1.0	15	0		1.8
12								1.0	15	0		7.1
13								.6	14	0		6.9
14								.5	14	0		6.6
15								.7	13	0		6.4
16								2.1	14	0		6.4
17								2.8	14	0		6.4
18								4.5	13	0		6.2
19								5.7	13	0		6.2
20								5.0	13	0		6.2
21								6.0	13	0		6.0
22								7.1	12	0		6.0
23								5.9	12	0		5.9
24								6.2	11	0		5.4
25								5.7	10	0		5.4
26								6.9	9.7	0		5.4
27								8.7	8.9	0		5.2
28								8.7	8.9	0		4.8
29								10	8.0	0		4.8
30								12	7.5	0		4.3
31		-----			-----		-----	12	-----	0		-----
Total	0	0	0	0	0	0	0	115.8	353.9	30.5	0	113.4
Mean	0	0	0	0	0	0	0	3.74	11.8	0.98	0	3.78
Ac-ft	0	0	0	0	0	0	0	230	702	60	0	225

Calendar year 1960: Max 22 Min 0 Mean 2.12 Ac-ft 1,540  
 Water year 1960-61: Max 16 Min 0 Mean 1.68 Ac-ft 1,220

\* Discharge measurement or observation of no flow made on this day.

## BLUE RIVER BASIN

9-448. McCullough diversion near Hoosier Pass, Colo.

Location--Lat 39°22'50", long 106°04'10", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.2, T.8 S., R.78 W., on left bank at entrance to Hoosier Pass tunnel,  $1\frac{1}{2}$  miles northwest of Hoosier Pass, about 2 miles downstream from diversion point, and 7 miles southwest of Breckenridge.

Records available--October 1957 to September 1961.

Gage--Water-stage recorder and Parshall flume. Altitude of gage is 10,986 ft (from State engineer).

Extremes--1957-61: Maximum daily discharge, 48 cfs June 15, 1959; no flow for most of each year.

Remarks--Records good. This is a transmountain diversion from McCullough Gulch in Blue River basin through Hoosier Pass tunnel to South Platte River basin whence it is again diverted to South Catamount Creek (revised) in the Arkansas River basin. Water is for municipal use by city of Colorado Springs. Diversion point is in sec.26, T.7 S., R.78 W. The entire flow is regulated by diversion gates.

Cooperation--Gage-height record furnished by city of Colorado Springs.

Discharge, in cubic feet per second, water year October 1960 to September 1961											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1								0	28	20	0
2								0	24	19	0
3								0	12	17	0
4								0	8.1	17	0
5								0	*7.0	12	0
6								0	8.1	*0	0
7								0	12	0	0
8								0	20	0	0
9								0	27	0	0
10								.2	31	0	0
11								2.7	28	0	2.4
12								4.0	25	0	8.3
13								2.6	25	0	6.7
14								1.4	26	0	5.6
15								.9	26	0	5.2
16								1.4	28	0	5.8
17								1.9	31	0	5.8
18								3.4	30	0	6.1
19								6.1	30	0	6.7
20								7.0	31	0	7.0
21								7.2	32	0	6.3
22								11	32	0	6.3
23								14	27	0	5.9
24								11	27	0	5.6
25								9.2	26	0	5.2
26								11	24	0	4.4
27								14	24	0	5.2
28								20	28	0	5.4
29								21	22	0	5.4
30								26	21	0	4.9
31								27	-----	0	-----
Total	0	0	0	0	0	0	0	203.0	720.2	85	114.2
Mean	0	0	0	0	0	0	0	6.55	24.0	2.74	3.81
Ac-ft	0	0	0	0	0	0	0	403	1,430	169	227

Calendar year 1960: Max 41 Min 0 Mean 3.90 Ac-ft 2,830

Water year 1960-61: Max 32 Min 0 Mean 3.08 Ac-ft 2,230

\* Discharge measurement or observation of no flow made on this day.



## BLUE RIVER BASIN

165

9-466. Blue River near Dillon, Colo.

Location.--Lat 39°32'58", long 106°02'22", in NW¼NE¼ sec.7, T.6 S., R.77 W., on right bank 0.3 mile downstream from Swan River and ½ miles south of Dillon.

Drainage area.--120 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,120 ft (from topographic map).

Extremes.--Maximum discharge during year, 306 cfs Aug. 1 (gage height, 3.69 ft); minimum daily, 17 cfs Mar. 21.

1957-61: Maximum discharge, 782 cfs June 8, 1958 (gage height, 4.73 ft); minimum daily, 17 cfs Mar. 21, 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Transmountain diversion above station by Boreas Pass ditch and Hoosier Pass tunnel (see elsewhere in this report).

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 30

May 1 to Sept. 30

2.4 16  
2.6 27  
2.8 47

2.7 36  
2.9 64  
3.1 105  
3.3 160  
3.6 270

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	33	23	24	21	20	20	40	234	151	246	94
2	41	33	23	23	21	20	20	50	250	145	250	92
3	42	32	23	22	21	20	20	59	250	136	*193	92
4	41	32	23	22	21	20	21	83	226	130	170	96
5	40	32	27	22	20	20	21	*83	202	128	148	101
6	39	32	27	23	19	20	21	74	*192	*130	128	*118
7	39	33	27	23	19	20	22	62	184	164	112	142
8	40	33	27	*23	20	20	22	54	192	181	*101	151
9	39	32	26	24	20	b19	21	53	212	167	98	160
10	37	31	26	24	20	20	21	56	242	157	96	167
11	37	31	26	24	20	20	21	66	258	148	92	170
12	37	31	26	23	20	20	*21	90	262	139	92	157
13	37	30	26	23	*19	20	22	105	254	128	92	133
14	40	30	26	23	18	19	22	103	246	118	98	115
15	40	30	25	24	19	19	22	90	238	108	98	108
16	41	30	25	23	20	18	22	74	*226	112	98	105
17	43	30	26	23	20	18	22	70	226	112	101	105
18	43	29	26	21	19	18	22	75	226	105	125	103
19	*43	30	26	21	b19	18	24	87	223	101	118	101
20	43	30	25	21	20	18	26	105	223	98	103	101
21	43	29	25	21	20	17	26	125	223	101	98	105
22	43	29	25	21	20	*18	28	136	223	110	96	108
23	41	*29	25	21	20	19	29	*143	216	122	94	112
24	40	29	25	22	20	20	29	157	202	110	92	112
25	41	29	25	23	20	20	29	160	195	103	85	112
26	40	29	25	22	20	20	28	157	184	101	90	108
27	37	29	25	20	b18	20	26	160	178	101	101	105
28	37	29	24	20	20	20	27	178	167	101	98	105
29	36	28	24	20	-	20	29	195	174	101	96	103
30	35	29	24	20	-----	20	33	209	167	110	90	105
31	34	-----	23	21	-----	20	-----	226	-----	160	90	-----
Total	1,232	913	798	687	554	601	717	5330	6495	3878	3594	5486
Mean	39.7	30.4	25.7	22.2	19.8	19.4	23.9	107	216	125	116	116
Ac-ft	2,440	1,810	1,580	1,360	1,100	1,190	1,420	6,600	12,880	7,690	7,130	6,910

Calendar year 1960: Max 422 Min 21 Mean 78.2 Ac-ft 56,720  
Water year 1960-61: Max 262 Min 17 Mean 72.0 Ac-ft 52,110

Peak discharge (base, 500 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 29 to Feb. 13, Feb. 16-18, Mar. 18-22.

## BLUE RIVER BASIN

9-470. Blue River at Dillon, Colo.

Location--Lat 39°36'50", long 106°03'05", in sec.18, T.5 S., R.77 W., on right bank 5 ft upstream from bridge on U. S. Highway 6 at east edge of Dillon, 300 ft upstream from Snake River, and 1,000 ft upstream from Tenmile Creek.

Drainage area--129 sq mi.

Records available--October 1910 to April 1961 (discontinued). Monthly discharge only for some periods, published in WSP 1313.

Gage--Water-stage recorder. Datum of gage is 8,821.17 ft above mean sea level, datum of 1929. Oct. 15, 1910, to Apr. 21, 1920, staff gage and Apr. 22, 1920, to Apr. 22, 1949, water-stage recorder, at site 15 ft upstream just below former bridge at same datum.

Average discharge--50 years (1910-60), 116 cfs (83,980 acre-ft per year), including diversions to Hoosier Pass tunnel since 1952.

Extremes--Maximum discharge during period October 1960 to April 1961, 43 cfs Apr. 30 (gage height, 1.25 ft); maximum gage height recorded, 3.71 ft Jan. 1 (backwater from ice); minimum daily discharge, 14 cfs Feb. 14, 15, 27.  
1910-61: Maximum discharge observed, 1,180 cfs June 2, 1914, June 14, 1924; maximum gage height observed, 4.35 ft June 2, 1914; minimum discharge observed, 7.4 cfs Mar. 22, 1935 (discharge measurement).

Remarks--Records good except those for periods of ice effect or no gage-height record, which are fair. Transmountain diversion above station by Boreas Pass ditch and Hoosier Pass tunnel (see elsewhere in this report). Diversions for irrigation of about 150 acres of hay meadows above station.

Rating table, Oct. 1, 1960, to Apr. 30, 1961, except periods of ice effect  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 1 to Apr. 30)

0.6	12
.8	20
1.0	30
1.2	42

Discharge, in cubic feet per second, October 1960 to April 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	33	27	20	13	16	17					
2	39	33	27	20	18	16	17					
3	39	32	28	20	18	16	17					
4	38	32	29	19	17	16	18					
5	38	32	28	19	16	16	18					
6	38	32	26	19	16	16	18					
7	38	32	26	18	16	16	17					
8	38	32	25	*19	17	16	18					
9	38	32	24	19	17	15	18					
10	38	30	24	20	17	17	18					
11	37	30	24	19	17	17	*18					
12	37	30	24	18	16	17	18					
13	36	31	24	18	15	17	18					
14	*37	31	24	18	14	17	18					
15	35	30	23	18	14	17	19					
16	36	29	23	19	*15	16	18					
17	37	28	23	18	15	16	18					
18	37	28	22	18	15	16	19					
19	37	29	22	18	15	16	24					
20	37	30	21	18	15	16	26					
21	37	29	21	18	15	16	26					
22	37	29	22	18	15	*15	27					
23	36	*28	21	18	15	15	29					
24	36	30	21	18	15	17	29					
25	35	29	21	19	15	17	29					
26	35	28	21	18	15	17	28					
27	35	28	20	17	14	17	28					
28	35	28	20	17	15	17	28					
29	35	27	20	17	-	17	30					
30	35	26	20	17	-----	17	37					
31	34	-----	20	17	-----	17	-----					
Total	1,140	898	721	569	440	507	663					
Mean	36.8	29.9	23.5	18.4	15.7	16.4	22.1					
Ac-ft	2,260	1,780	1,430	1,130	873	1,010	1,320					

Calendar year 1960: Max 478 Min 20 Mean 83.3 Ac-ft 60,470  
Water year 1960-61: Max - Min - Mean - Ac-ft -

Peak discharge (base, 500 cfs)--No peak above base.

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Nov. 10-12, 16-19, 21, 23, Nov. 29 to Dec. 2, Dec. 5 to Jan. 1, Jan. 9. No gage-height record Jan. 2-8, Jan. 10 to Apr. 11 (stage-discharge relation affected by ice during most of periods).

9-475. Snake River near Montezuma, Colo.

Location.--Lat 39°36'20", long 105°56'33", in NW¼ sec.19, T.5 S., R.76 W. (projected), on right bank 200 ft downstream from North Fork and 4½ miles northwest of Montezuma.

Drainage area.--58.9 sq mi.

Records available.--July 1942 to September 1946, October 1951 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,320 ft (from topographic map). Prior to Oct. 14, 1943, staff gage at same site and datum.

Average discharge.--14 years, 61.6 cfs (44,600 acre-ft per year).

Extremes.--Maximum discharge during year, 394 cfs July 31 (gage height, 2.82 ft); minimum daily, 7.6 cfs Feb. 27, Mar. 9, 30. 1942-46, 1951-61: Maximum discharge, 1,250 cfs June 10, 1952 (gage height, 3.51 ft); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Small diversions above station for irrigation and domestic use.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	8.0	1.6	67
1.1	17	2.0	140
1.3	32	2.5	275

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	20	17	12	9.0	8.0	8.6	25	260	136	236	61
2	23	20	17	11	9.0	8.4	8.6	31	239	128	172	61
3	21	20	14	10	8.8	8.6	9.4	33	170	120	142	64
4	21	20	15	9.8	8.4	8.4	9.8	33	148	126	*126	64
5	20	19	15	9.8	8.0	7.8	9.4	*27	*140	*132	113	74
6	20	19	15	10	7.8	8.0	9.4	22	150	122	106	*86
7	20	19	16	10	7.8	8.2	8.8	20	170	116	98	97
8	20	17	16	10	8.2	7.8	9.2	18	245	107	95	100
9	23	15	16	*11	8.6	7.6	9.6	23	266	104	88	107
10	23	17	15	10	8.8	8.6	9.0	35	251	98	81	107
11	23	18	15	9.6	9.0	8.4	*8.8	51	263	97	77	104
12	22	18	14	9.4	8.8	8.0	9.2	64	260	95	86	100
13	20	17	14	9.5	*8.2	8.0	9.2	55	242	86	88	97
14	23	17	13	9.7	8.4	8.2	8.4	40	233	81	113	89
15	22	16	13	10	8.6	8.6	8.2	48	224	79	89	84
16	25	16	12	10	8.6	8.6	9.2	38	*242	74	88	82
17	25	17	13	9.4	8.8	9.0	10	41	266	70	104	79
18	*24	17	14	9.0	8.4	8.6	12	46	248	69	89	81
19	23	18	14	9.0	8.0	8.4	16	70	236	67	79	82
20	23	18	14	9.0	8.0	8.4	16	84	248	70	76	88
21	22	18	14	9.0	8.2	8.2	14	97	242	81	72	88
22	22	18	13	9.0	8.2	9.2	16	*109	230	72	67	84
23	22	18	11	9.0	8.0	*9.2	15	122	212	62	61	84
24	21	18	11	9.0	8.0	8.6	13	115	200	58	64	79
25	20	19	12	9.4	8.4	8.2	13	124	182	61	76	76
26	20	18	12	9.2	8.2	8.0	12	124	170	62	70	77
27	20	16	11	8.6	7.6	7.8	12	156	162	61	64	79
28	21	15	10	8.4	8.2	8.0	14	172	156	70	61	81
29	19	15	10	8.4	-	8.4	16	188	146	97	58	84
30	18	17	11	8.6	-----	7.6	21	227	144	124	70	77
31	18	-----	11	8.9	-----	8.2	-----	235	-----	165	65	-----
Total	667	530	418	295.7	234.0	257.0	344.8	2474	6345	2890	2875	2516
Mean	21.5	17.7	13.5	9.54	8.36	8.29	11.5	79.8	212	93.2	92.7	83.9
Ac-ft	1,320	1,090	829	587	464	510	684	4,910	12,590	5,730	5,700	4,990

Calendar year 1960: Max 460 Min 8 Mean 64.0 Ac-ft 46,440

Water year 1960-61: Max 266 Min 7.6 Mean 54.4 Ac-ft 39,360

Peak discharge (base, 500 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 9-15, Nov. 23 to Dec. 23, Apr. 14, 15. No gage-height record Nov. 16-22, Dec. 24 to Apr. 11 (stage-discharge relation affected by ice during most of period), June 3-5.

## BLUE RIVER BASIN

9-477. Keystone Gulch near Dillon, Colo.

Location.--Lat 39°35'40", long 105°58'19", in NE¼NE¼ sec.26, T.5 S., R.77 W., on right bank 0.7 mile upstream from mouth and 4.7 miles southeast of Dillon.

Drainage area.--8.80 sq mi.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,350 ft (from topographic map).

Extremes.--Maximum discharge during year, 18 cfs July 31 (gage height, 1.95 ft); minimum not determined.

1957-61: Maximum discharge, 90 cfs June 5, 1958 (gage height, 2.75 ft), from rating curve extended above 28 cfs; minimum not determined.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No known diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	1.7	1.8	11
1.6	3.0	2.0	24
1.7	6.0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	2.4						3.3	1.3	6.0	7.0	3.0
2	2.6	2.5						4.0	1.3	5.7	6.5	3.0
3	2.6	2.5						5.6	1.3	5.7	5.7	4.0
4	2.6	2.5						5.4	1.2	6.0	*4.5	4.5
5	2.6	2.4						*3.8	*1.2	*7.0	4.2	6.0
6	2.7	2.4						3.3	1.2	6.0	3.9	*6.0
7	2.7	2.4						2.9	1.1	5.7	3.9	5.7
8	2.7	2.3					2.0	2.9	1.2	5.4	3.9	6.0
9	2.7	2.0						3.9	1.2	5.1	3.9	6.0
10	2.7	2.2						6.0	1.1	5.1	3.6	5.4
11	2.7	2.4										
12	2.7	2.5						9.0	1.1	5.1	3.6	4.8
13	2.6	2.4						9.0	1.0	5.1	3.9	4.8
14	2.7	2.2						6.5	1.0	5.1	3.9	4.5
15	2.7	2.2						5.4	1.0	4.8	5.1	4.5
16								5.1	1.0	4.8	3.9	4.5
17	2.9	2.1	1.9	1.8	1.4	1.5						
18	2.7	2.1			(*)			5.4	*1.0	4.5	4.2	4.7
19	*2.6	2.1						6.0	1.0	3.9	5.7	4.5
20	2.5	2.2						8.5	9.5	3.9	4.2	4.4
21	2.6	2.0						10	9.5	3.9	3.6	5.0
22	2.5	2.0						10	9.5	4.8	3.6	5.6
23	2.5	2.0										
24	2.5	2.0						11	9.0	5.7	3.6	5.8
25	2.5	2.0						12	8.5	5.1	3.3	6.0
26	2.5	1.9						*11	8.5	3.9	3.3	5.8
27	2.6	1.9						12	8.0	3.9	3.3	5.6
28	2.6	1.8						12	7.0	3.9	3.6	5.4
29	2.5	1.9						12				
30	2.2	2.0						12	6.5	3.9	3.3	5.8
31	2.6							13	6.5	5.4	3.3	6.4
								13		8.0	3.3	
Total	80.8	65.4	58.9	55.8	39.2	46.5	67.5	250.0	294.0	155.7	124.7	156.9
Mean	2.61	2.18	1.9	1.8	1.4	1.5	2.25	8.06	9.80	5.02	4.02	5.23
Ac-ft	160	130	117	111	78	92	134	496	583	309	247	311

Calendar year 1960: Max 33 Min - Mean 5.61 Ac-ft 4,080

Water year 1960-61: Max 13 Min - Mean 3.82 Ac-ft 2,770

Peak discharge (base, 45 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 30 to Nov. 3, Nov. 8 to May 5 (stage-discharge relation affected by ice during most of period), Sept. 3-6, 15-30.



9-480. Snake River at Dillon, Colo.

Location.--Lat 39°36'45", long 106°02'30", in SW $\frac{1}{4}$  sec.17, T.5 S., R.77 W., on left bank 0.6 mile upstream from mouth and 1 mile east of Dillon.

Drainage area.--92 sq mi, approximately.

Records available.--October 1910 to September 1919, October 1929 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 8,870 ft (from topographic map). Oct. 15, 1910, to Sept. 30, 1919, staff gage and Oct. 1, 1929, to Apr. 22, 1953, water-stage recorder, at site 0.6 mile downstream at different datums; datum lowered 1.54 ft Oct. 1, 1929.

Average discharge.--41 years, 64.2 cfs (46,480 acre-ft per year).

Extremes.--Maximum discharge during year, 403 cfs July 31 (gage height, 3.79 ft); minimum daily, 8.5 cfs Mar. 30.

1910-19, 1929-61: Maximum discharge, 1,200 cfs June 13, 1935, from rating curve extended above 700 cfs; maximum gage height, 4.89 ft June 10, 1952, site and datum then in use; minimum daily discharge, 3 cfs Nov. 9, 1912.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 350 acres above station. Diversion for power 6 miles above station in sec.19, T.5 S., R.76 W., prior to Dec. 15, 1959; water returned to Blue River just above mouth of Straight Creek.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 20-30)

1.9	7.0	2.6	68
2.0	10	3.0	135
2.1	15	3.5	280
2.3	32		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	26	b19			16	12	49	252	123	280	73
2	28	26	b19			16	12	53	252	110	224	73
3	28	24	20			16	14	55	194	106	*173	87
4	27	25	20			16	15	55	160	112	145	87
5	25	25	b19			15	14	*42	*152	*127	125	98
6	25	25	b18			14	14	30	155	115	113	*105
7	25	25	b18			14	12	27	172	112	106	110
8	25	24	b19	(*)		15	13	27	227	103	101	119
9	28	22	b19			14	14	30	273	93	95	129
10	28	b20	18			14	12	48	270	88	88	127
11	28	23	18			14	*12	65	275	84	85	121
12	26	22	b17			15	12	78	275	81	92	115
13	25	21	b16			15	12	71	266	75	96	110
14	28	21	b16			16	12	54	248	69	129	105
15	27	b19	b16			17	14	49	239	64	101	100
16	36	b19	b15	16	15	16	11	43	*233	65	93	95
17	35	b19	b15		(*)	16	13	53	245	64	123	90
18	*34	b20	15			15	15	56	242	64	105	88
19	31	b20	17			15	25	74	236	65	95	90
20	31	b19	17			14	31	82	245	69	90	92
21	29	b20	17			14	24	95	235	83	88	93
22	28	21	17			*14	29	123	224	76	81	90
23	27	24	17			14	30	*129	209	64	75	90
24	26	21	b16			12	23	119	197	60	75	88
25	25	20	b17			10	20	121	180	63	90	81
26	25	21	b17			9.4	18	121	165	63	88	81
27	25	20	16			8.8	18	152	155	52	79	81
28	26	b17	b16			9.1	21	170	148	65	78	84
29	26	b18	b16			11	29	183	131	93	72	90
30	23	b19	16			8.5	41	224	131	142	82	81
31	26		16			9.4		236		183	83	
Total	856	646	532	496	420	4232	542	2734	6389	2749	3365	2883
Mean	27.6	21.5	17.2	16	15	13.7	18.1	88.2	213	88.7	109	96.1
Ac-ft	1,700	1,280	1,060	984	833	839	1,080	5,420	12,670	5,450	6,670	5,720

Calendar year 1960: Max 467 Min 15 Mean 73.1 Ac-ft 53,080  
Water year 1960-61: Max 280 Min 8.5 Mean 60.4 Ac-ft 43,710

Peak discharge (base, 450 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 5-14, Dec. 21-23, Dec. 30 to Mar. 21 (stage-discharge relation affected by ice during most of periods).

## BLUE RIVER BASIN

9-501. Tenmile Creek below North Fork, at Frisco, Colo.

Location.--Lat 39°34'35", long 106°06'30", in SW<sup>1</sup>NE<sup>1</sup> sec.34, T.5 S., R.78 W., on left bank 500 ft downstream from North Fork, 800 ft downstream from bridge on U. S. Highway 6, and 0.6 mile west of Frisco.

Drainage area.--93.3 sq mi.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,090 ft (from topographic map).

Extremes.--Maximum discharge during year, 688 cfs May 31 (gage height, 4.96 ft); minimum daily, 9.2 cfs Feb. 7, 14.  
1957-61: Maximum discharge, 1,260 cfs May 28, 1958; maximum gage height, 5.70 ft May 24, 1958; minimum daily discharge, 7 cfs Mar. 8, 14, 1960.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Natural flow of stream affected by a few small diversions above station for irrigation and municipal use and transbasin diversion from Robinson Reservoir (capacity, 2,520 acre-ft) in Eagle River basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	11	3.0	50	4.0	244
2.4	18	3.3	82	4.4	370
2.7	31	3.6	137	4.7	510

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	21	17	13	11	10	12	41	450	133	195	34
2	22	21	16	13	11	11	13	55	425	118	142	34
3	22	21	16	12	11	11	14	68	338	109	*124	39
4	22	21	16	11	11	11	16	77	272	107	95	40
5	21	20	16	11	11	11	15	*63	278	111	80	45
6	21	20	16	11	10	11	13	48	*303	*102	67	*57
7	21	21	16	12	9.2	11	15	42	330	122	62	70
8	20	20	16	12	9.6	11	15	41	358	112	*61	90
9	21	21	16	*12	10	10	15	47	382	105	53	103
10	21	19	15	12	10	11	15	71	374	85	52	124
11	21	20	15	11	10	11	14	111	370	78	54	109
12	21	20	15	11	10	11	*14	144	358	72	56	95
13	20	19	15	11	*9.6	11	14	142	330	68	63	80
14	21	19	15	11	9.2	11	14	102	312	61	55	77
15	21	19	15	12	9.8	11	13	90	309	66	44	69
16	21	19	15	12	10	10	13	96	*312	60	44	62
17	22	19	16	12	9.6	10	14	112	321	57	51	54
18	22	19	15	12	9.4	10	15	147	306	51	45	52
19	22	18	15	11	10	10	20	208	300	43	42	60
20	24	18	15	11	10	10	21	233	280	51	41	69
21	23	18	15	11	10	*10	21	247	275	72	41	78
22	22	18	16	11	10	9.6	21	292	250	68	41	85
23	22	*18	15	12	10	11	23	*303	230	55	39	90
24	22	18	14	13	10	11	23	278	216	51	39	90
25	22	18	14	13	10	11	21	272	205	57	42	84
26	21	18	14	12	10	10	20	303	180	53	44	88
27	21	18	14	11	9.6	10	20	342	167	50	39	90
28	22	17	13	10	10	10	22	358	172	56	34	96
29	21	17	13	10	-	10	26	425	152	66	32	109
30	21	18	13	10	-----	11	32	435	140	95	34	96
31	20	-----	12	10	-----	12	-----	455	-----	173	38	-----
Total	665	573	464	356	281	523.6	526	5,649	9,695	2,512	1,850	2,269
Mean	21.5	19.1	15.0	11.5	10.0	10.6	17.5	182	290	81.0	59.7	75.6
Ac-ft	1,320	1,140	920	706	557	652	1,040	11,200	17,250	4,980	3,670	4,500

Calendar year 1960: Max 672 Min 7 Mean 82.2 Ac-ft 59,650  
Water year 1960-61: Max 455 Min 9.2 Mean 66.2 Ac-ft 47,940

Peak discharge (base, 700 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31, Nov. 1, Nov. 10 to Dec. 10, Mar. 22 to Apr. 2, Apr. 15, 16. No gage-height record Dec. 11 to Mar. 21 (stage-discharge relation affected by ice during most of period).

9-505. Tenmile Creek at Dillon, Colo.

Location.--Lat 39°36'45", long 106°03'15", in sec.18, T.5 S., R.77 W., on left bank at Dillon, 250 ft downstream from bridge on U. S. Highway 6 and 600 ft upstream from mouth.

Drainage area.--113 sq mi.

Records available.--October 1910 to September 1919, October 1929 to April 1961 (discontinued). Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 8,817.97 ft above mean sea level, unadjusted. Oct. 15, 1910, to Sept. 30, 1919, staff gage and Oct. 26, 1929, to Aug. 4, 1939, water-stage recorder, at site 250 ft upstream at different datum.

Average discharge.--40 years (1910-19, 1929-60), 121 cfs (87,600 acre-ft per year).

Extremes.--Maximum discharge during period October 1960 to April 1961; 48 cfs Apr. 30 (gage height, 2.34 ft); maximum gage height, 5.36 ft sometime during period Dec. 15 to Jan. 8 (backwater from ice); minimum daily discharge, 10 cfs Feb. 7, 14, 1910-19, 1929-61; Maximum discharge, 2,010 cfs June 1, 1933 (gage height, 5.82 ft, site and datum then in use), from rating curve extended above 800 cfs; minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Transmountain diversion above station by Fremont Pass ditch (see elsewhere in this report) 1929-43. Diversions for irrigation of about 200 acres of hay meadows above station. Natural flow of stream affected by transbasin diversion from Robinson Reservoir (capacity, 2,520 acre-ft) in Eagle River basin.

Rating table, Oct. 1, 1960, to Apr. 30, 1961, except periods of ice effect  
(gage height, in feet, and discharge, in cubic feet per second)

1.9	10
2.0	17
2.1	26
2.3	48

Discharge, in cubic feet per second, October 1960 to April 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	22	19	14	12	13	14					
2	22	24	18	14	12	14	14					
3	22	24	18	14	12	14	17					
4	22	22	18	13	12	14	19					
5	21	21	18	13	12	14	16					
6	20	21	18	13	11	14	16					
7	20	22	18	14	10	14	16					
8	20	22	18	*14	11	14	16					
9	20	22	18	14	12	14	14					
10	22	20	18	14	12	16	14					
11	21	20	17	13	12	16	*14					
12	21	20	17	13	12	16	14					
13	20	20	17	13	11	15	14					
14	22	20	17	13	10	15	13					
15	22	20	17	14	12	16	13					
16	22	20	18	14	*12	16	13					
17	23	20	18	14	11	16	14					
18	*24	20	17	14	11	16	19					
19	24	19	17	13	12	16	26					
20	25	19	17	13	12	15	29					
21	25	19	17	13	13	15	26					
22	24	19	18	13	13	14	27					
23	24	*19	18	14	13	*14	29					
24	23	19	16	15	13	16	28					
25	22	19	16	15	13	16	25					
26	22	19	16	14	13	15	22					
27	22	19	16	13	12	14	22					
28	23	19	16	12	12	14	25					
29	23	19	15	12	-	13	30					
30	24	19	14	12	-----	14	38					
31	20	-----	14	12	-----	14	-----					
Total	687	608	529	416	333	457	597					
Mean	22.2	20.3	17.1	13.4	11.9	14.7	19.9					
Ac-ft	1,360	1,210	1,050	825	660	906	1,180					

Calendar year 1960: Max 801 Min 11 Mean 98.3 Ac-ft 71,370

Water year 1960-61: Max - Min - Mean - Ac-ft -

Peak discharge (base, 700 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31, Nov. 9-22, Nov. 24 to Dec. 14, Jan. 9 to Feb. 7, Apr. 14, 15. No gage-height record Nov. 23, Dec. 15 to Jan. 8, Feb. 8 to Mar. 11, Mar. 20-23 (stage-discharge relation affected by ice during most of periods).

## BLUE RIVER BASIN

9-507. Blue River below Dillon, Colo.

Location.--Lat 39°37'30", long 106°04'05", in SE $\frac{1}{4}$  sec. 12, T.5 S., R.78 W., on right bank 0.5 mile upstream from Straight Creek, 1.1 miles northwest of Dillon, and 1.2 miles downstream from Tenmile Creek.

Drainage area.--335 sq mi.

Records available.--January 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,760 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,230 cfs June 1; maximum gage height, 3.12 ft May 31; minimum daily discharge, 45 cfs

Mar. 9, 22, 27-30.

1960-61: Maximum discharge, 1,720 cfs June 17, 1960 (gage height, 3.44 ft); minimum daily, 45 cfs Mar. 9, 22, 27-30, 1961.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Transmountain diversions above station (see elsewhere in this report). Diversions for irrigation of about 700 acres of hay meadows above station. Natural flow of stream affected by transbasin diversion from Robinson Reservoir (capacity, 2,520 acre-ft) in Eagle River basin.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 15 to June 25, July 20 to Sept. 12)

0.8	42	1.6	340
.9	58	2.0	570
1.0	83	3.0	1,520
1.3	198		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	100	72	60	56	52	50	157	1,080	520	759	194
2	97	93	72	54	56	52	52	194	1,010	490	640	190
3	97	86	71	54	56	52	56	212	857	460	*534	216
4	97	78	66	54	53	50	60	243	710	470	426	220
5	97	76	66	54	55	50	56	*234	682	450	360	243
6	93	68	66	56	55	47	53	190	*675	*460	315	285
7	93	73	66	52	55	50	53	161	710	470	290	325
8	90	73	70	54	55	48	53	153	815	430	271	*375
9	90	73	70	*55	55	45	56	157	944	400	248	408
10	90	63	68	53	55	48	56	216	960	370	230	438
11	90	76	67	53	55	48	55	295	928	350	225	420
12	90	70	66	53	55	48	*56	365	920	325	234	385
13	86	76	66	56	*55	47	63	370	843	300	252	345
14	93	76	66	53	53	47	63	290	787	271	295	320
15	100	76	66	53	53	50	63	234	759	252	248	300
16	114	73	62	56	53	52	56	220	*752	238	230	285
17	114	70	64	53	55	50	56	225	800	234	276	266
18	*117	70	63	53	53	43	63	252	840	216	266	266
19	114	74	66	56	50	48	97	360	820	212	248	281
20	117	74	64	56	53	48	110	420	820	216	230	315
21	110	78	64	55	53	43	90	456	800	262	225	340
22	107	78	64	55	50	45	107	546	770	266	212	340
23	103	*78	62	55	53	*50	107	605	730	238	198	360
24	103	73	60	55	52	48	100	*612	700	216	190	360
25	100	76	62	55	52	48	80	584	660	225	212	330
26	97	73	64	56	53	47	73	626	620	212	216	335
27	97	73	53	56	50	45	73	710	620	202	207	340
28	100	70	58	55	53	45	83	752	580	207	202	340
29	100	66	58	56	-	45	100	815	550	248	186	370
30	90	63	53	53	-----	45	129	920	520	360	186	340
31	93	-----	53	56	-----	50	-----	976	-----	504	207	-----
Total	3,079	2,251	2,008	1,736	1,507	1,496	2,209	12,550	23,262	10,074	8,818	9,532
Mean	99.3	75.0	64.8	56.0	53.8	48.3	73.6	405	775	325	284	318
Ac-ft	6,110	4,460	3,980	3,440	2,990	2,970	4,380	24,890	46,140	19,980	17,490	18,910

Calendar year 1960: Max 1,530 Min 58 Mean 265 Ac-ft 192,600

Water year 1960-61: Max 1,080 Min 45 Mean 215 Ac-ft 155,700

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 18-23, Nov. 28 to Jan. 9, June 17 to July 11.



## 9-535. Blue River above Green Mountain Reservoir, Colo.

Location--Lat 39°49'55", long 106°13'20", in S½ sec.24, T.2 S., R.79 W., on left bank 300 ft north of old State Highway 9, just upstream from high-water line of Green Mountain Reservoir at elevation 7,950 ft, 1.3 miles downstream from Brush Creek, and 18 miles southeast of Kremmling.

Drainage area--514 sq mi.

Records available--October 1943 to September 1961.

Gage--Water-stage recorder. Datum of gage is 7,946.56 ft above mean sea level, unadjusted.

Average discharge--18 years, 440 cfs (318,500 acre-ft per year).

Extremes--Maximum discharge during year, 1,730 cfs June 1 (gage height, 2.94 ft); minimum daily, 66 cfs Mar. 10.

1943-61: Maximum discharge, 5,020 cfs June 11, 1952 (gage height, 4.93 ft); maximum gage height recorded, 6.75 ft Dec. 16, 1949 (ice jam); minimum daily discharge, 64 cfs Mar. 15, 1957.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are fair. Transmountain diversions above station (see elsewhere in this report). Many small diversions for irrigation of about 4,000 acres of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	60	2.0	640
.8	85	2.5	1,150
1.1	155	3.0	1,800
1.5	320		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	143	b103	78	78	73	85	311	1,460	721	1,060	342
2	160	137	b107	76	78	74	93	364	1,440	632	941	331
3	160	134	b109	73	78	73	102	397	1,270	584	840	375
4	150	125	b108	72	78	70	*108	442	1,010	576	*667	386
5	145	123	97	72	78	70	107	*419	900	632	568	408
6	145	115	96	73	76	70	105	336	*880	600	504	460
7	145	119	96	74	74	70	105	311	920	*608	484	497
8	145	121	100	*75	74	68	109	293	1,130	624	472	*546
9	140	117	100	76	74	68	105	293	1,370	576	454	608
10	138	115	100	77	75	66	107	364	1,390	532	419	667
11	136	123	97	76	76	69	103	478	1,330	490	402	624
12	136	125	94	76	76	70	103	584	1,390	478	402	553
13	136	123	94	74	76	69	115	624	1,280	448	430	490
14	140	121	92	75	74	68	115	504	1,210	424	466	454
15	145	123	90	77	*74	69	113	442	1,200	414	419	424
16	150	121	86	79	74	72	107	424	*1,160	386	414	408
17	154	121	86	80	75	74	107	448	1,220	375	466	397
18	*160	121	89	79	73	72	134	472	1,210	358	460	380
19	155	125	92	78	71	72	176	584	1,170	353	430	408
20	155	137	88	76	70	72	230	760	1,190	370	402	460
21	152	125	88	76	72	72	186	790	1,160	419	392	504
22	149	121	88	76	70	*72	202	920	1,110	436	370	518
23	149	117	88	76	70	76	218	1,050	1,020	397	348	546
24	146	115	85	76	68	82	190	*963	952	375	331	539
25	143	117	82	75	68	80	169	910	930	375	370	478
26	140	*111	82	75	72	80	149	963	860	370	414	497
27	140	115	82	76	68	77	155	1,150	770	358	392	478
28	143	111	76	77	70	76	166	1,250	760	358	370	490
29	146	97	76	77	-	76	210	1,250	730	375	342	546
30	131	b100	76	78	-----	76	270	1,320	721	490	336	518
31	134	-----	76	78	-----	84	-----	1,470	-----	703	375	-----
Total	4,538	3,618	2,823	2,356	2,060	2,260	4,245	20,886	33,143	14,837	14,740	14,332
Mean	146	121	91.1	76.0	73.6	72.9	142	674	1,105	479	475	478
Ac-ft	9,000	7,180	5,600	4,670	4,090	4,480	8,420	41,430	65,740	29,430	29,240	28,430

Calendar year 1960: Max 2,340 Min 76 Mean 386 Ac-ft 279,900

Water year 1960-61: Max 1,470 Min 66 Mean 328 Ac-ft 237,700

Peak discharge (base, 2,600 cfs)--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note--No gage-height record Oct. 1-18, Dec. 5 to Apr. 4 (stage-discharge relation affected by ice during most of period).

## BLUE RIVER BASIN

9-570. Green Mountain Reservoir near Kremmling, Colo.

Location.--Lat 39°52'45", long 106°19'45", in NE¼ sec.15, T.2 S., R.80 W., in hoist house at right end of Green Mountain Dam on Blue River, 0.6 mile upstream from Elliott Creek and 13 miles southeast of Kremmling.

Drainage area.--599 sq mi (includes 15.4 sq mi of Elliott Creek above diversion for Elliott Creek feeder canal).

Records available.--November 1942 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 7,800 ft above mean sea level (Bureau of Reclamation bench mark). Gage heights have been reduced to elevations above mean sea level. Prior to Sept. 25, 1951, mercury gage in powerhouse at same datum. Sept. 25, 1951, to Oct. 1, 1953, electric-tape gage at present site and datum.

Extremes.--Maximum contents observed during year, 145,900 acre-ft Sept. 27 (elevation, 7,949.53 ft); minimum, 54,220 acre-ft Apr. 18 (elevation, 7,891.49 ft).  
1942-61: Maximum contents observed, 148,900 acre-ft July 10, 1947 (elevation, 7,950.95 ft); minimum (since appreciable storage was attained), 19,600 acre-ft May 24, 1957 (elevation, 7,849.06 ft).

Remarks.--Reservoir is formed by an earth- and rock-fill dam. Dam completed and storage began in November 1942. Capacity of reservoir, 146,900 acre-ft between elevations 7,800 (sill of outlet gate) and 7,950 ft (top of radial spillway gates). Dead storage, 7,760 acre-ft. Reservoir is used for power development and storage for replacement of water diverted to South Platte River basin during late irrigation season. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	7,936.66	120,200	-
Oct. 31.....	7,930.54	109,100	-11,100
Nov. 30.....	7,927.52	103,800	-5,300
Dec. 31.....	7,920.53	92,430	-11,370
Calendar year 1960.....	-	-	-16,570
Jan. 31.....	7,908.43	74,850	-17,580
Feb. 28.....	7,900.76	64,950	-9,900
Mar. 31.....	7,896.77	60,160	-4,790
Apr. 30.....	7,892.06	54,840	-5,320
May 31.....	7,903.09	67,860	+13,020
June 30.....	7,940.37	127,300	+59,440
July 31.....	7,945.17	136,800	+9,500
Aug. 31.....	7,945.19	136,900	+100
Sept. 30.....	7,949.04	144,900	+8,000
Water year 1960-61.....	-	-	+24,700

† Elevation at 12 p.m.

## BLUE RIVER BASIN

175

9-575. Blue River below Green Mountain Reservoir, Colo.

Location.--Lat 39°52'50", long 106°20'00", in NE $\frac{1}{4}$  sec. 15, T.2 S., R.80 W., on left bank 0.3 mile upstream from Elliott Creek, 0.3 mile downstream from Green Mountain Dam, and 13 miles southeast of Kremmling.

Drainage area.--599 sq mi (includes 15.4 sq mi of Elliott Creek above diversion for Elliott Creek feeder canal).

Records available.--October 1937 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 7,682.66 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1951, at site 3.7 miles downstream at different datum.

Average discharge.--24 years, 501 cfs (362,700 acre-ft per year).

Extremes.--Maximum discharge during year, 1,910 cfs June 2 (gage height, 7.61 ft); minimum daily, 87 cfs June 29, July 4.  
1937-61: Maximum discharge, 4,000 cfs June 4, 1938 (gage height, 5.93 ft, site and datum then in use), from rating curve extended above 3,000 cfs; minimum daily (prior to construction of Green Mountain Reservoir), 80 cfs Feb. 18-24, 1938, Feb. 18, 19, 1940; no flow at times in 1943.

Remarks.--Records good. Flow regulated by Green Mountain Reservoir (see preceding page). Diversions for irrigation of about 5,000 acres above station. Transmountain diversions above station (see elsewhere in this report).

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	512	215	300	302	405	182	184	*221	1,070	90	512	593
2	516	201	295	304	405	184	194	231	1,050	90	417	573
3	515	205	293	300	405	184	192	215	582	92	306	587
4	519	199	293	329	405	180	521	274	351	87	309	585
5	512	193	289	397	405	180	413	215	860	89	313	487
6	505	206	293	397	405	184	417	219	868	182	317	492
7	515	208	362	397	405	172	238	225	939	233	547	496
8	525	206	360	394	267	185	189	341	967	231	494	*499
9	522	203	299	*391	238	179	212	405	954	229	485	419
10	507	203	300	391	242	179	*405	375	300	266	471	313
11	523	204	303	391	249	175	440	384	293	313	481	171
12	445	205	300	388	245	181	*455	451	506	313	498	168
13	420	202	302	391	243	173	459	535	338	458	491	168
14	433	239	309	391	239	180	467	505	338	542	*595	252
15	224	243	347	394	*243	175	213	564	338	549	591	392
16	208	236	343	394	241	221	201	549	222	553	593	406
17	210	266	306	394	241	192	202	590	*90	547	585	415
18	220	423	301	394	247	194	200	590	92	554	581	463
19	215	220	300	391	277	191	204	571	93	567	619	437
20	211	209	298	394	255	189	204	579	93	555	624	289
21	209	234	298	394	249	312	203	585	90	549	633	304
22	213	262	299	397	245	*184	201	587	90	550	641	285
23	205	245	302	397	240	189	201	984	92	552	627	244
24	206	204	299	389	301	189	199	*1,050	92	406	632	255
25	200	237	303	400	182	191	198	1,070	89	367	633	591
26	202	219	305	400	177	190	201	1,050	90	467	589	590
27	211	217	302	400	175	194	222	1,060	90	552	589	473
28	474	309	292	400	179	189	230	1,050	89	538	578	621
29	207	262	263	400	-	192	229	1,040	87	522	585	838
30	206	239	331	400	-----	189	219	1,060	89	524	587	1,030
31	202	-----	358	403	-----	186	-----	1,070	-----	516	585	-----
Total	1 07 95	6 91 9	9 55 1	1 19 04	7 81 7	5 89 0	8 11 3	1 86 48	1 12 42	1 20 84	1 65 11	1 34 48
Mean	348	231	308	384	279	190	270	602	375	390	533	448
Ac-ft	21,410	13,720	18,940	23,610	15,500	11,680	16,090	36,990	22,300	23,970	32,750	26,670

Calendar year 1960: Max 1,600 Min 198 Mean 482 Ac-ft 350,200  
Water year 1960-61: Max 1,070 Min 87 Mean 364 Ac-ft 263,600

\* Discharge measurement made on this day.

## PINEY RIVER BASIN

9-595. Piney River near State Bridge, Colo.

Location.--Lat 39°48', long 106°35', in sec.16, T.3 S., R.82 W., on left bank at downstream side of private bridge at Perry Olsen Ranch just downstream from Rock Creek, 6 miles southeast of State Bridge.

Drainage area.--82.6 sq mi.

Records available.--May 1944 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 7,272.35 ft above mean sea level, unadjusted. Prior to July 29, 1944, staff gage and July 29, 1944, staff gage and July 29, 1944, to Oct. 24, 1947, water-stage recorder, at datum 2.38 ft higher.

Average discharge.--17 years, 73.4 cfs (53,140 acre-ft per year).

Extremes.--Maximum discharge during year, 475 cfs May 30 (gage height, 4.58 ft); minimum daily, 7.5 cfs Oct. 30.  
1944-61: Maximum discharge, 1,110 cfs June 8, 1952 (gage height, 5.61 ft); minimum daily, 1.9 cfs Sept. 1, 18, 19, 1954.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of about 400 acres of hay meadows above and below station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	8.0	3.3	89
2.5	16	3.6	150
2.7	26	4.0	260
3.0	48	4.5	460

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	14	16	14	12	12	12	43	370	74	40	13
2	10	*11	16	12	12	13	12	62	350	64	35	13
3	9.6	14	18	10	12	14	13	69	284	57	54	18
4	9.6	14	16	*8	12	14	14	*74	238	59	39	22
5	*9.2	14	16	10	11	14	13	65	220	59	30	27
6	8.8	12	*16	10	10	14	13	50	*222	54	24	38
7	8.4	15	14	10	10	14	13	46	231	48	21	46
8	8.4	15	14	12	10	*13	13	45	274	44	20	48
9	8.8	11	16	12	11	12	13	52	312	41	20	54
10	8.4	14	18	12	12	11	12	93	312	38	18	56
11	9.2	16	16	12	12	12	12	150	264	34	16	46
12	9.2	16	16	12	12	13	12	187	274	31	16	*36
13	8.4	16	14	12	12	13	14	174	257	29	16	30
14	10	16	14	12	12	14	12	120	241	31	16	25
15	10	16	14	14	11	15	13	100	214	34	14	22
16	10	16	14	12	12	16	11	103	208	27	*14	22
17	12	16	12	12	12	16	12	103	203	27	15	23
18	11	18	14	12	11	15	17	130	192	24	14	23
19	10	18	16	12	10	14	23	187	192	*25	12	32
20	10	18	14	10	11	13	28	228	*179	30	11	39
21	9.2	18	14	12	12	12	22	254	169	43	11	49
22	9.6	18	16	12	12	11	20	278	155	41	11	57
23	9.2	18	16	12	11	12	24	*306	141	32	9.6	57
24	8.8	20	16	12	9.5	13	22	284	111	27	8.8	53
25	8.0	20	16	*14	10	14	19	278	109	24	12	47
26	8.0	20	14	14	12	13	18	323	102	24	21	53
27	8.8	18	14	12	11	12	17	366	86	22	17	58
28	10	16	14	10	11	*10	18	366	82	22	14	68
29	11	14	12	12	-	11	26	382	74	20	12	93
30	7.5	14	12	12	-----	11	37	440	71	26	12	72
31	12	-----	12	12	-----	11	-----	420	-----	37	12	-----
Total	293.1	476	460	364	315.5	402	505	5,778	6,137	1,148	585.4	1,240
Mean	9.45	15.9	14.8	11.7	11.3	13.0	16.8	186	205	37.0	18.9	41.3
Ac-ft	581	944	912	722	626	797	1,000	11,460	12,170	2,280	1,160	2,460

Calendar year 1960: Max 550 Min 7.5 Mean 70.2 Ac-ft 50,990  
Water year 1960-61: Max 440 Min 7.5 Mean 48.5 Ac-ft 35,110

Peak discharge (base, 520 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 2, 6, Nov. 9 to Mar. 31 (no gage-height record Nov. 15 to Mar. 28), Apr. 3-9.



9-605. Rock Creek near Toponas, Colo.

Location.--Lat 40°02'28", long 106°39'19", in NW<sup>1</sup> sec.24, T.1 N., R.83 W., on right bank 0.1 mile upstream from Horse Creek, three-quarters of a mile downstream from Shoe and Stocking Creek, and 8 miles east of Toponas.

Drainage area.--48 sq mi, approximately.

Records available.--October 1952 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,544 ft (from topographic map).

Average discharge.--9 years, 30.1 cfs (21,790 acre-ft per year).

Extremes.--Maximum discharge during year, 294 cfs May 11 (gage height, 3.91 ft); maximum gage height, 4.02 ft Apr. 4 (backwater from ice); minimum daily discharge, 5 cfs Oct. 30.  
1952-61: Maximum discharge, 443 cfs June 6, 1957 (gage height, 4.77 ft); minimum daily, 2.2 cfs Aug. 30, 31, Sept. 2, 1954.

Remarks.--Records good except those for periods of ice effect, which are poor. No regulation or diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	4.0	2.6	60
2.0	7.5	3.0	116
2.1	13	3.5	208
2.3	28		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	7				5.5	6.8	116	184	25	20	18
2	7.2	6.5				6	10	137	172	19	16	13
3	7.2	7.5		(*)		6.5	20	143	157	18	16	20
4	7.2	8.0				6.5	40	*126	143	17	9.2	19
5	6.8	7.5	(*)			6.5	25	91	132	19	8.0	26
6	6.8	7				6	15	64	*136	17	6.8	36
7	6.8	8.5				6.5	12	58	126	18	6.4	26
8	7.2	8.6				6	10	65	111	21	6.8	15
9	7.2	8.6				6.5	9.7	92	100	16	7.2	13
10	7.5	8				6	9.2	132	94	15	6.8	12
11	7.2	8				5.5	9.2	178	88	13	6.4	*10
12	8.0	7.5				6	12	176	78	13	7.2	9.2
13	8.0	7.5				6.5	28	148	68	12	10	8.6
14	9.7	7.2				6.5	11	106	64	11	*8.0	8.0
15	9.7	*7.2				7	11	97	60	11	6.8	7.5
16	9.7	7	7.5	6.5	6.5	8	10	96	54	11	6.8	8.6
17	14	7				9	15	81	48	*11	14	16
18	14	7				10	26	92	46	11	10	14
19	10	6.5				11	50	122	42	10	6.8	26
20	11	6.5				11	40	139	39	11	6.8	24
21	8.0	7				11	36	157	*36	21	8.0	24
22	8.0	8				10	40	172	30	18	7.2	31
23	7.5	7.5				10	42	*170	27	12	6.1	28
24	7.5	7.5				*11	40	161	26	9.2	5.4	25
25	*6.4	7.5				12	36	164	26	9.2	6.4	23
26	6.1	7.5				9.2	34	174	23	10	16	28
27	6.4	7				6.4	32	170	22	13	10	37
28	6.4	6				6.1	38	176	22	11	6.4	49
29	5.2	6				5.8	62	182	22	11	6.4	67
30	5	6				6.4	84	204	25	10	9.2	45
31	6					6.8		196		12	23	
Total	244.9	218.6	232.5	201.5	182.0	237.2	813.9	4,185	2,201	435.4	290.1	686.9
Mean	7.90	7.29	7.5	6.5	6.5	7.65	27.1	135	73.4	14.0	9.36	22.9
Ac-ft	486	434	461	400	361	470	1,610	8,300	4,370	864	575	1,360

Calendar year 1960: Max 206 Min 5 Mean 34.9 Ac-ft 25,300  
Water year 1960-61: Max 204 Min 5 Mean 27.2 Ac-ft 19,690

Peak discharge (base, 200 cfs).--May 11 (8:30 p.m.) 294 cfs (3.91 ft); May 30 (11:30 a.m.) 258 cfs (3.77 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29 to Nov. 3, Nov. 5-7, 10-13, Nov. 16 to Mar. 25 (no gage-height record Dec. 5 to Mar. 24), Apr. 2-8, 17-28.

## BIG ALKALI CREEK BASIN

9-608. Big Alkali Creek near Burns, Colo.

Note.--Records for the 1961 water year have been withheld pending better definition of the stage-discharge relation for medium stage. They will be published in a subsequent annual report.

9-609. Catamount Creek near Burns, Colo.

Location.--Lat 39°51', long 106°48', in center of sec.33, T.2 S., R.84 W., on right bank three-quarters of a mile upstream from unnamed tributary, 1½ miles upstream from mouth, and 5 miles southeast of Burns.

Drainage area.--5.88 sq mi.

Records available.--October 1955 to September 1961 (discontinued).

Gage.--Water-stage recorder.

Average discharge.--6 years, 1.88 cfs (1,360 acre-ft per year).

Extremes.--Maximum discharge during year, 14 cfs May 10 (gage height, 3.02 ft); no flow for many days.  
1955-61: Maximum discharge, 38 cfs May 9, 1957 (gage height, 3.86 ft); no flow at times in 1958-61.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. One small diversion above station for irrigation of hay meadows, and one diversion above station for irrigation of land along Colorado River.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 6-28)

Oct. 1 to Apr. 27

Apr. 28 to Sept. 30

2.0	0	1.9	0.3
2.1	.2	2.0	.6
2.3	.8	2.2	1.5
2.4	1.5	2.4	2.8
		2.6	4.9
		2.9	10

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2				0.2	0.5	2.9	6.8	1.7	1.3	0.6
2	.1	*.2				.3	.5	4.2	6.2	1.3	1.3	.6
3	.1	.2		(*)		.3	.6	4.5	4.7	1.3	1.2	1.0
4	.1	.2				.3	.6	*4.8	3.8	1.2	1.0	1.0
5	*.1	.2	(*)		0	.3	*.6	3.1	3.7	1.2	.9	1.2
6	.1	.2				.3	.6	2.4	*3.3	1.1	.7	1.4
7	.1	.2				.3	.6	2.4	3.5	1.2	.8	1.5
8	.1	.1	0.2			.2	.6	2.3	3.2	1.0	1.0	1.8
9	.1	.1			.1	.2	.6	3.0	3.0	1.0	.8	2.1
10	.2	.1			.1	.3	.5	6.8	3.0	1.0	.7	1.9
11	.2	.1			.1	.3	.5	9.2	2.8	1.0	.6	*1.4
12	.2	.1			.2	.3	.6	7.5	2.5	1.0	.8	1.2
13	.2	.1			.1	.3	.6	6.0	2.2	.8	.5	1.2
14	.2	.1			.1	.4	.5	4.1	2.2	.9	*.6	1.0
15	.2	.1			.1	.5	.5	4.1	1.8	1.1	.6	1.0
16	.2	.1		0		.6	.5	4.8	1.7	1.0	.6	1.0
17	.2	.1			.2	.6	.6	4.9	1.6	*1.0	.8	1.2
18	.2	.1			.1	.5	.7	6.1	1.4	.9	.8	1.4
19	.2	.1			.1	.5	.9	7.8	1.4	.9	.8	2.4
20	.2	.2			.2	.5	1.2	7.8	1.3	1.0	.5	1.9
21	.2	.2			.3	.5	.9	7.1	*1.2	1.3	.5	2.0
22	.2	.2	1		.3	.4	.9	8.2	1.2	1.2	.5	2.6
23	.2	.2		(*)	.3	.4	1.0	8.2	1.2	1.0	.4	2.4
24	.2	.2			.2	.5	.8	8.4	1.1	.9	.4	2.3
25	.2	.2			.2	.6	.7	7.7	1.1	.9	.7	2.0
26	.2	.2			.3	.5	*.7	7.5	1.1	.8	.9	2.1
27	.2	.2			*.3	.5	.9	7.7	.7	.8	.8	2.5
28	.2	.2			.3	.4	1.2	7.5	1.6	.8	.6	2.7
29	.2	.1			-	*.4	1.8	6.9	1.4	.8	.5	3.6
30	.2	.2	0		-----	.4	2.3	8.2	1.5	1.0	.5	3.2
31	.1	-----			-----	.5	-----	7.5	-----	1.3	.6	-----
Total	5.3	4.7	4.3	0	3.8	12.3	23.5	183.6	72.2	32.4	22.7	52.2
Mean	0.17	0.16	0.14	0	0.14	0.40	0.78	5.92	2.41	1.05	0.73	1.74
Ac-ft	11	9.3	8.5	0	7.5	24	47	364	143	64	45	104

Calendar year 1960: Max 15 Min 0 Mean 1.75 Ac-ft 1,270

Water year 1960-61: Max 9.2 Min 0 Mean 1.14 Ac-ft 827

Peak discharge (base, 15 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7-13. No gage-height record Nov. 14 to Apr. 5 (stage-discharge relation affected by ice during part of period).

9-630. Eagle River at Red Cliff, Colo.

Location.--Lat 39°30'35", long 106°22'00", in SE $\frac{1}{4}$  sec.19, T.6 S., R.80 W., on left bank at Red Cliff, 0.3 mile upstream from Turkey Creek.

Drainage area.--72.2 sq mi.

Records available.--October 1910 to September 1925, May 1944 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 8,648.48 ft above mean sea level, datum of 1929. Jan. 8, 1911, to Sept. 30, 1925, chain gage at bridge a quarter of a mile downstream at different datum. May 25, 1944, to Oct. 12, 1952, water-stage recorder at site 200 ft upstream at datum 3.54 ft higher.

Average discharge.--32 years, 54.9 cfs (39,750 acre-ft per year).

Extremes.--Maximum discharge during year, 170 cfs May 30 (gage height, 3.61 ft); maximum gage height, 3.72 ft Mar. 13 (backwater from ice); minimum daily discharge, 5 cfs Mar. 9.

1910-25, 1944-61: Maximum discharge observed, 1,010 cfs June 5, 1912 (gage height, 4.0 ft, site and datum then in use), from rating curve extended above 500 cfs; minimum daily, 1 cfs Oct. 15, 1917.

Remarks.--Records good except those for periods of ice effect, which are poor. Transmountain diversions above station by Columbine, Ewing, and Wurtz ditches (see elsewhere in this report). Transbasin diversion above station from Robinson Reservoir (capacity, 2,520 acre-ft) to Tenmile Creek for mining development. Small diversions for irrigation of about 400 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.4	6.0	2.7	21	3.3	102
2.5	9.0	3.0	53	3.6	170

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	11	11	9	10	8	8.4	51	145	45	31	15
2	12	*12	11	8.5	10	8	8.1	59	140	39	30	15
3	12	10	11	*8.5	10	8.5	9.5	66	138	36	31	24
4	12	11	10	8	10	8.5	12	*60	131	39	31	23
5	12	10	9	8.5	9.5	8	11	51	*110	39	30	27
6	*12	10	*8	9	9.5	7	11	38	106	41	29	34
7	12	11	8	9.5	9.5	*7	11	33	104	39	29	39
8	12	11	8.5	9.5	9.5	6	10	31	106	36	27	49
9	12	10	9	9.5	10	5	11	36	106	33	20	47
10	12	10	9.5	9.5	10	6	12	49	106	28	17	39
11	12	10	9	9.5	10	7	12	70	100	28	15	30
12	12	11	8.5	9.5	10	7	12	82	95	28	15	*25
13	12	12	8	9.5	10	8	12	70	91	26	17	22
14	12	12	7.5	9.5	10	8	11	54	86	25	16	20
15	13	11	7.5	10	10	8	10	52	81	26	15	20
16	12	11	7.5	9.5	10	8	10	52	79	23	*16	19
17	14	11	8	9.5	10	8	12	60	76	23	21	20
18	15	11	9	9.5	9.5	8	15	69	70	21	21	19
19	14	11	9	9.5	9	8	22	84	69	*21	18	24
20	13	11	8.5	9	9.5	8	*23	97	*64	23	15	37
21	12	11	8.5	9	9.5	7	19	97	60	33	15	32
22	12	11	9	9	9.5	6	19	*104	57	28	14	38
23	12	11	9	9	9	7	23	118	53	23	14	41
24	12	11	9	9	8.5	8	21	118	52	29	14	47
25	12	11	9	9.5	9	8	18	116	51	23	17	38
26	12	11	9	*11	9	8	16	122	48	20	21	39
27	12	11	9	11	8.5	8	14	129	47	19	17	40
28	12	9.5	8.5	10	8.5	8	17	129	51	19	15	41
29	12	9.5	8	9	-	8.5	26	134	45	19	14	47
30	11	10	8	9.5	-----	*8.7	39	143	46	20	15	43
31	10	-----	8	10	-----	8.4	-----	150	-----	26	18	-----
Total	378	323.0	272.5	290.5	267.5	235.6	455.0	2524	2513	878	618	954
Mean	12.2	10.8	8.79	9.37	9.55	7.60	15.2	81.4	83.8	28.3	19.9	31.8
Ac-ft	750	641	540	576	531	467	902	5,010	4,980	1,740	1,230	1,890

Calendar year 1960: Max 400 Min 7 Mean 44.6 Ac-ft 32,250  
 Water year 1960-61: Max 150 Min 5 Mean 26.6 Ac-ft 19,260

Peak discharge (base, 280 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 1, Nov. 9 to Mar. 29 (no gage-height record Nov. 18 to Mar. 7), Apr. 6-9, 14, 15.

## EAGLE RIVER BASIN

g-645. Homestake Creek near Red Cliff, Colo.

Location---Lat 39°28'25", long 106°22'00", in sec.6, T.7 S., R.80 W., on right bank at downstream side of Forest Service highway bridge, 3 miles upstream from mouth, and 3 miles south of Red Cliff. Prior to May 9, 1961, at site 15 ft downstream.

Drainage area---58.9 sq mi.

Records available---October 1910 to September 1918, May 1944 to September 1961. Published as "at Redcliff" October 1910 to September 1916.

Gage---Water-stage recorder. Datum of gage is 8,783 ft above mean sea level (river-profile survey). Jan. 8, 1911, to Sept. 30, 1918, staff gage at three sites 2½ to 2.8 miles downstream at different datums. May 25, 1944, to May 8, 1961, water-stage recorder at site 15 ft downstream at same datum.

Average discharge---25 years, 88.4 cfs (64,000 acre-ft per year).

Extremes---Maximum discharge during year, 604 cfs May 29 (gage height, 3.09 ft); minimum daily, 2.8 cfs Jan. 20.  
1910-18, 1944-61: Maximum discharge observed, 1,300 cfs June 24, 1918 (gage height, 6.2 ft, site and datum then in use); minimum observed, 0.6 cfs Jan. 25, 1915 (discharge measurement).

Remarks---Records good except those for periods of ice effect, which are poor. No diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1 to Nov. 6, Apr. 10-16, Apr. 19 to May 8)

Oct. 1 to May 8

May 9 to Sept. 30

1.1	4.0	1.6	30	1.3	12	2.2	167
1.2	6.0	1.8	54	1.5	23	2.5	285
1.4	15	2.1	105	1.7	43	2.9	490
				1.9	78		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	8.8	5.5	3.2	3.4	3.6	4.6	86	425	125	70	24
2	6.4	*9.2	6	3.4	3.4	3.8	4.6	94	360	99	58	22
3	6.0	7.6	6.5	*3.2	3.4	4.0	5	96	256	88	50	39
4	5.8	8.0	7	3.0	3.4	4.0	7	*97	211	81	41	44
5	5.8	7.6	6.5	3.0	3.2	4.2	8	94	*239	86	38	54
6	*5.8	6.8	*5	3.0	3.0	4.6	10	76	247	76	31	78
7	5.4	6.5	5	3.0	3.0	*5.0	9	69	290	70	28	110
8	5.2	6.5	5	3.0	3.2	4.6	9	64	390	64	26	137
9	5.6	6.5	5	3.0	3.4	3.6	9	*55	420	58	23	185
10	6.0	6.5	5.5	3.2	3.4	4.0	8.4	94	400	52	21	192
11	5.8	7	4.6	3.0	3.4	4.0	8.4	164	375	48	19	137
12	5.4	7	4.6	3.0	3.6	4.0	9.2	227	340	42	19	*99
13	5.4	7	4.2	3.0	3.4	4.0	9.2	203	321	40	22	76
14	6.0	7	4.2	3.2	3.4	4.4	10	125	303	36	19	62
15	7.6	6	4.0	3.4	3.4	5	9.6	99	281	40	16	52
16	8.4	7	3.6	3.2	3.4	5	8.4	99	290	35	*16	49
17	8.8	7	3.6	3.0	3.4	5.5	10	122	285	32	34	49
18	9.6	7	4.0	3.0	3.2	5	14	167	277	30	32	46
19	8.8	7	4.0	3.0	3.0	5	*19	260	272	*27	25	62
20	8.8	6	4.0	2.8	3.2	5	23	303	*264	28	21	74
21	8.4	6	3.6	3.0	3.4	4.4	24	298	243	42	21	83
22	8.0	6	3.6	3.0	3.4	4.0	27	*380	211	38	19	94
23	8.0	6	3.6	3.0	3.4	4.4	31	420	181	29	16	110
24	7.6	6	3.6	3.0	3.0	4.6	27	400	167	24	16	113
25	7.2	6.5	3.6	3.4	3.2	5.0	24	380	160	23	23	101
26	6.8	6.5	3.4	*3.6	3.4	5.5	30	442	147	23	40	110
27	7.2	6	3.2	3.4	3.4	5	22	460	134	24	34	113
28	7.6	5.5	3.2	3.0	3.4	5	23	430	160	23	28	122
29	8.0	5	3.0	3.0	-	5	48	410	131	22	22	134
30	7.6	5.5	3.0	3.2	-----	*5	69	460	125	40	22	119
31	8.8	-----	3.0	3.4	-----	5	-----	420	-----	78	27	-----
Total	218.2	201.0	134.6	96.6	92.8	141.2	520.4	7,094	7,905	1,523	877	2,690
Mean	7.04	6.70	4.34	3.12	3.31	4.55	17.3	229	264	49.1	28.3	89.7
Ac-ft	433	399	267	192	184	280	1,030	14,070	15,680	3,020	1,740	5,340

Calendar year 1960: Max 718 Min 3 Mean 73.5 Ac-ft 53,340  
Water year 1960-61: Max 460 Min 2.8 Mean 58.9 Ac-ft 42,640

Peak discharge (base, 710 cfs)---No peak above base.

\* Discharge measurement made on this day.

Note---Stage-discharge relation affected by ice Nov. 7 to Apr. 9 (no gage-height record Dec. 10 to Mar. 6), Apr. 17, 18.



9-651. Cross Creek near Minturn, Colo.

Location--Lat 39°34'05", long 106°24'45", in SW $\frac{1}{4}$  sec.36, T.5 S., R.81 W., on right bank 0.4 mile upstream from mouth and  $\frac{1}{2}$  miles southeast of Minturn.

Drainage area--33.5 sq mi.

Records available--May 1956 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 7,990 ft (from topographic map). Prior to July 18, 1956, staff gage at site 0.3 mile downstream at different datum.

Average discharge--5 years, 51.1 cfs (36,900 acre-ft per year).

Extremes--Maximum discharge during year, 450 cfs May 30 (gage height, 4.67 ft); minimum daily, 0.8 cfs Feb. 7-14, 16.

1956-61: Maximum discharge, 754 cfs June 30, 1957; maximum gage height, 5.54 ft July 18, 1957; minimum daily discharge, that of Feb. 7-14, 16, 1961.

Remarks--Records good except those for periods of ice effect, which are poor. Diversion above station for municipal supply of Minturn.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 2-25)

Oct. 1 to Feb. 12

Feb. 13 to Sept. 30

2.3	1.0	2.2	0.4	3.4	90
2.4	2.0	2.4	3.0	3.8	163
2.5	3.5	2.6	9.0	4.2	270
2.6	5.5	2.8	21	4.5	370
		3.0	40		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.1	4.5	5.0	3.4	1.4	1.4	3.0	37	273	112	94	20
2	4.7	*4.3	5.0	3.0	1.4	1.6	3.0	47	264	84	69	18
3	4.3	4.3	5.0	*3.0	1.4	1.7	4.0	51	156	73	60	28
4	4.1	4.5	5.0	2.8	1.4	1.9	5.5	*54	126	68	41	30
5	4.1	4.5	5.0	2.4	1.2	2.0	5.0	46	*145	80	34	34
6	*4.1	4.3	*5.0	2.4	1.0	2.0	5.5	35	156	66	28	52
7	3.7	4.0	5.0	2.4	.8	*2.0	5.0	31	183	57	27	68
8	3.7	4.0	4.6	2.4	.8	1.7	4.5	28	231	54	24	73
9	3.7	4.0	4.6	2.4	.8	1.7	4.5	30	285	50	21	124
10	4.1	4.0	4.6	2.4	.8	1.9	4.0	52	258	45	20	139
11	4.3	4.4	4.6	2.4	.8	1.9	3.5	87	228	39	18	92
12	4.1	4.4	4.2	2.4	.8	2.0	3.5	102	252	34	18	*69
13	4.1	4.4	4.2	2.4	.8	2.0	4.5	87	222	31	18	54
14	4.1	4.4	4.2	2.6	.8	2.2	5.0	60	222	30	18	46
15	4.7	4.0	4.2	3.2	.9	2.0	5.0	51	192	33	17	41
16	4.5	4.6	4.2	2.6	.8	2.5	3.8	55	181	31	*19	38
17	4.7	4.6	4.2	2.6	.9	3.2	5.0	56	210	26	34	42
18	4.9	4.6	4.2	2.6	1.0	2.8	7.2	69	205	26	37	41
19	4.7	4.6	4.2	2.2	1.0	2.4	10	98	205	*22	27	58
20	4.5	4.4	4.2	2.0	.9	2.4	*14	128	*208	20	22	65
21	4.5	5.0	3.4	1.6	1.0	2.5	16	137	185	37	20	66
22	4.3	5.0	3.4	1.6	1.0	2.2	16	185	159	35	19	77
23	4.3	5.0	3.4	1.2	1.2	2.4	15	*231	133	24	18	80
24	4.1	5.0	3.4	1.4	1.1	3.0	14	210	124	20	15	83
25	4.1	5.0	3.4	1.6	1.1	3.2	13	195	119	19	20	73
26	4.1	4.2	3.0	*2.0	1.3	2.7	15	237	110	18	51	79
27	4.1	4.2	3.0	2.0	1.4	2.5	11	264	100	26	38	82
28	4.1	4.2	3.0	1.6	1.3	2.4	14	252	117	24	26	89
29	4.1	4.6	3.0	1.0	-	2.5	19	240	99	28	21	104
30	4.0	5.0	3.0	1.4	-----	*2.7	3.0	361	94	31	20	86
31	4.0	-----	3.0	1.4	-----	3.8	-----	308	-----	121	24	-----
Total	131.9	134.0	126.2	68.4	29.1	71.2	268.5	3824	5442	1364	918	1951
Mean	4.25	4.47	4.07	2.21	1.04	2.30	8.95	123	181	44.0	29.6	65.0
Ac-ft	262	266	250	136	58	141	533	7,580	10,790	2,710	1,820	3,870

Calendar year 1960: Max 475 Min 1.4 Mean 48.4 Ac-ft 35,120  
Water year 1960-61: Max 361 Min 0.8 Mean 39.3 Ac-ft 28,420

Peak discharge (base, 400 cfs)--May 30 (4 a.m.) 450 cfs (4.67 ft).

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 7 to Dec. 19, Apr. 5-15. No gage-height record Dec. 20 to Feb. 12 (stage-discharge relation affected by ice during most of period).

## EAGLE RIVER BASIN

9-673. Alkali Creek near Wolcott, Colo.

Location.--Lat 39°45', long 106°40', in SE¼ sec.27, T.3 S., R.83 W., on right bank 100 ft below unnamed tributary, 100 ft above ford and headgate, and ½ miles north of Wolcott.

Drainage area.--27 sq mi, approximately.

Records available.--October 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is about 7,300 ft (estimated from nearby level line).

Extremes.--Maximum discharge during year, 310 cfs Aug. 26 (gage height, 5.56 ft), from rating curve extended above 41 cfs on basis of slope-area measurement of peak flow; no flow for many days.  
1958-61: Maximum discharge, that of Aug. 26, 1961; no flow for many days in each year.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-13, Aug. 1 to Sept. 30)

1.5	0	2.0	2.2
1.7	.2	2.2	5.2
1.8	.5	2.3	7.0
1.9	1.2		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1				0	0.6	1.1	1.8	0.8	0.6	0.1
2	0	*.1				0	.5	1.1	1.6	.6	.3	
3	0	.1				0	.8	1.1	1.4	.6	.2	.1
4	0	.1		(*)		0	.7	*1.1	1.2	.6	.2	.1
5	*0	.1				0	.6	1.9	1.1	.5	.2	.1
6	0	.1		(*)		0	.8	2.6	*1.2	.5	.1	.1
7	0	b.1				*0	.5	2.6	1.1	.6	.2	.1
8	0	b.1				0	.5	2.3	1.1	.5	.1	.1
9	.1	b.1				0	.5	2.5	1.0	.5	.1	.1
10	.1	.1				0	.5	4.2	.9	.5	.1	.1
11	.1	0				0	.5	6.6	.8	.4	.1	0
12	.1	0				0	.8	6.6	.7	.5	.1	*0
13	.1	0				.1	.7	6.1	.6	.5	.1	0
14	.1	0				.2	.6	4.6	.6	.8	.1	0
15	.1	0				.3	.6	4.7	.6	1.4	.1	0
16	.1	0				.4	.4	5.2	.5	1.3	*.1	0
17	.1	0				.6	.6	5.2	.4	1.3	.1	0
18	.1	0				.5	.7	5.4	.5	1.4	.1	.2
19	.1	0				.4	*.8	5.7	.4	*1.3	.1	1.8
20	.1	0				.4	.9	5.7	*.4	1.7	.1	1.6
21	.1	0				.3	.7	5.0	.4	1.6	.1	4.1
22	.1	0				.3	.7	5.2	.7	1.4	.1	3.6
23	.1	0				.4	.8	*5.0	.7	1.3	0	4.1
24	.1	0				.4	.8	5.0	.4	1.2	0	2.6
25	.1	0		(*)		.5	.7	4.4	.4	1.1	.4	1.9
26	.1	0				.5	.8	3.8	.6	1.1	*4.5	*1.9
27	.1	0				.4	.8	3.5	.6	1.0	.1	1.8
28	.1	0				*.4	.8	3.3	.7	1.1	.1	1.7
29	.1	0				.4	1.0	2.6	.8	1.4	.1	2.9
30	b.1	0				*.5	1.1	2.5	.8	.7	.1	1.9
31	.1	-----				.5	-----	2.1	-----	1.8	.1	-----
Total	2.3	1.0	0	0	0	7.5	20.8	118.7	24.0	30.0	8.7	31.1
Mean	0.07	0.03	0	0	0	0.24	0.69	3.83	0.80	0.97	0.28	1.04
Ac-ft	4.6	2.0	0	0	0	15	41	235	48	60	17	62

Calendar year 1960: Max 27 Min 0 Mean 1.90 Ac-ft 1,380

Water year 1960-61: Max 6.6 Min 0 Mean 0.67 Ac-ft 485

Peak discharge (base, 15 cfs).--July 31 (7 p.m.) 22 cfs (2.99 ft); Aug. 26 (2 p.m.) 310 cfs (5.56 ft).

\* Discharge measurement or observation of no flow made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 10, Mar. 13-28, Aug. 10-16.

9-680. Brush Creek near Eagle, Colo.

Location--Lat 39°33'40", long 106°46'20", in SE $\frac{1}{4}$  sec.1, T.6 S., R.84 W., on left bank 150 ft downstream from Beecher Creek,  $1\frac{1}{4}$  miles downstream from confluence of East and West Brush Creeks, and  $7\frac{1}{2}$  miles southeast of Eagle.

Drainage area--71 sq mi, approximately.

Records available--October 1950 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 7,450 ft (estimated from nearby level line).

Average discharge--11 years, 43.9 cfs (31,780 acre-ft per year).

Extremes--Maximum discharge during year, 176 cfs June 12 (gage height, 3.54 ft); maximum gage height, 3.55 ft Jan. 6 (backwater from ice); minimum daily discharge, 16 cfs many days in March and April.

1950-61: Maximum discharge, 775 cfs June 7, 1952 (gage height, 5.10 ft), from rating curve extended above 400 cfs; minimum daily, 12 cfs Feb. 21, 1955.

Remarks--Records fair. Small diversions for irrigation of hay meadows above and below station. One small diversion to Gypsum Creek above station. Slight regulation by Zurcher's Lake (capacity, 450 acre-ft) on West Brush Creek for irrigation of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 21-29, June 10 to Sept. 30)

2.4	15	3.0	87
2.5	21	3.5	198
2.7	40		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	27	22	20	20	19	16	29	*138	52	46	26
2	27	26	23	20	20	19	16	33	129	45	41	26
3	27	*27	23	22	20	19	17	34	100	44	48	32
4	27	27	23	*24	20	19	17	33	80	44	36	34
5	*27	27	*22	22	20	19	16	33	64	46	30	40
6	26	27	20	20	18	19	16	31	74	45	27	48
7	25	27	20	20	18	*19	16	29	89	40	26	53
8	23	27	21	20	20	17	16	27	117	37	24	55
9	23	26	22	20	20	17	16	28	136	34	23	63
10	23	23	21	19	20	17	16	*32	133	31	23	67
11	23	25	21	19	20	17	16	43	131	29	23	49
12	26	25	20	20	20	17	17	56	142	27	23	*44
13	29	26	20	20	20	17	17	56	131	27	22	39
14	31	26	21	20	20	17	17	48	114	26	22	34
15	30	24	21	20	20	17	16	44	108	27	23	31
16	29	24	20	20	20	17	17	41	108	26	*24	30
17	30	24	21	20	20	17	17	40	108	25	46	32
18	29	23	21	20	20	16	20	46	104	24	45	31
19	28	25	21	19	18	16	20	58	*98	*28	33	38
20	28	23	21	18	20	17	*23	67	96	34	28	41
21	27	23	21	18	20	16	21	71	89	40	27	44
22	27	23	21	18	20	16	22	*80	78	37	25	48
23	27	23	21	20	18	17	23	93	69	36	23	56
24	27	23	20	20	18	17	22	89	66	27	22	52
25	27	23	20	20	19	17	20	87	59	24	26	46
26	27	23	20	*20	19	17	20	91	55	23	26	46
27	27	23	20	20	19	16	20	89	50	23	24	46
28	27	21	18	19	19	16	20	112	50	23	22	48
29	27	20	18	19	-	17	23	136	49	26	21	59
30	27	20	18	20	-----	*17	27	146	53	30	22	48
31	27	-----	19	20	-----	16	-----	140	-----	37	25	-----
Total	835	731	640	617	546	534	560	1,942	2,818	1,017	876	1,306
Mean	26.9	24.4	20.6	19.9	19.5	17.2	18.7	62.6	93.9	32.8	28.3	43.5
Ac-ft	1,660	1,450	1,270	1,220	1,080	1,060	1,110	3,850	5,590	2,020	1,740	2,590

Calendar year 1960: Max 272 Min 14 Mean 45.7 Ac-ft 33,160

Water year 1960-61: Max 146 Min 16 Mean 34.0 Ac-ft 24,640

Peak discharge (base, 160 cfs)--May 30 (1 a.m.) 173 cfs (3.49 ft); June 12 (1 a.m.) 176 cfs (3.54 ft).

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Nov. 29, 30, Dec. 6, 7, 14, 16, 28-31, Jan. 2-8, 20-22, Feb. 6, 7, 19, 23, 24.

## EAGLE RIVER BASIN

9-700. Eagle River below Gypsum, Colo.

Location.--Lat 39°39', long 106°57', in NW¼ sec.5, T.5 S., R.85 W., on right bank 30 ft downstream from bridge on U. S. Highways 6 and 24 at Gypsum and 150 ft downstream from Gypsum Creek.

Drainage area.--957 sq mi.

Records available.--October 1946 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,270 ft.

Average discharge.--15 years, 585 cfs (423,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,640 cfs May 30 (gage height, 6.36 ft); minimum daily, 142 cfs Feb. 24.  
1946-61: Maximum discharge, 6,580 cfs June 11, 1952; maximum gage height, 9.17 ft June 29, 1957; minimum daily discharge, 110 cfs Feb. 21, 1955, Feb. 3, 1956.

Remarks.--Records good. Transmountain diversions above station (see elsewhere in this report). Transbasin diversions above station from Robinson Reservoir (capacity, 2,520 acre-ft) to Tenmile Creek for mining development. Many small diversions for irrigation of hay meadows above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

2.9	130	4.5	790
3.0	145	5.0	1,180
3.2	189	6.0	2,200
3.5	285	6.5	2,820
4.0	500		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	167	203	236	172	165	149	159	325	2,220	738	561	256
2	165	214	217	157	165	151	159	389	2,160	629	475	293
3	165	*211	233	149	165	155	161	450	1,700	561	460	373
4	163	209	233	*149	165	155	175	475	1,320	525	385	418
5	*161	211	*220	153	159	153	175	480	*1,250	578	341	465
6	157	214	189	157	155	153	167	385	1,280	540	309	550
7	153	227	172	167	155	153	177	357	1,330	490	285	635
8	149	230	189	177	159	*145	177	325	1,600	475	278	713
9	149	223	197	179	161	145	167	305	1,970	436	274	832
10	151	211	217	172	159	153	175	*361	2,040	410	267	994
11	151	211	209	175	161	153	175	545	1,860	381	260	825
12	151	230	197	172	161	153	172	832	1,970	361	249	653
13	155	236	184	172	163	155	179	895	1,760	333	243	561
14	170	236	172	172	161	172	177	665	1,650	317	233	*505
15	172	243	172	172	161	182	165	535	1,550	313	*217	450
16	187	233	159	170	163	179	167	485	1,490	293	206	428
17	197	236	182	172	163	189	167	485	1,540	271	220	450
18	197	233	211	167	161	179	175	540	1,510	263	260	455
19	206	239	203	170	151	170	203	744	1,480	*253	239	515
20	206	239	197	165	155	165	*249	1,090	*1,440	239	227	550
21	200	230	192	165	159	163	256	1,130	1,360	285	220	605
22	197	233	206	165	157	159	233	*1,400	1,230	337	217	707
23	197	230	200	167	155	161	249	1,670	1,070	289	209	758
24	197	227	189	165	142	170	260	1,630	954	256	209	777
25	197	230	187	167	151	175	243	1,430	902	246	214	653
26	195	230	189	*167	155	165	217	1,600	839	233	274	665
27	192	236	197	165	151	159	206	1,850	764	227	297	665
28	192	223	177	161	151	159	203	1,970	770	239	253	683
29	192	189	155	165	-	*153	223	1,850	744	243	233	811
30	195	217	155	167	-----	153	267	2,330	683	256	230	804
31	189	-----	155	167	-----	155	-----	2,270	-----	502	246	-----
Total	5,515	6,734	5,991	5,160	4,429	4,981	5,878	29,798	4,243	1,151	8,591	18,049
Mean	178	224	193	166	158	161	196	961	1,415	372	277	602
Ac-ft	10,940	13,360	11,880	10,230	8,780	9,880	11,660	59,100	84,170	22,850	17,040	35,800

Calendar year 1960: Max 3,660 Min 139 Mean 544 Ac-ft 395,200  
Water year 1960-61: Max 2,330 Min 142 Mean 408 Ac-ft 295,700

Peak discharge (base, 3,500 cfs).--No peak above base.

\* Discharge measurement made on this day.



9-705. Colorado River near Dotsero, Colo.

Location.--Lat 39°38'40", long 107°04'40", in sec.6, T.5 S., R.86 W., on left bank about 500 ft south of U. S. Highways 6 and 24, 1½ miles west of Dotsero, and 1½ miles downstream from Eagle River.

Drainage area.--4,390 sq mi, approximately.

Gage.--Water-stage recorder. Altitude of gage is 6,130 ft (from topographic map).

Records available.--October 1940 to September 1961.

Average discharge.--21 years, 2,150 cfs (1,557,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,360 cfs May 31 (gage height, 6.32 ft); minimum daily, 670 cfs Jan. 4.  
1940-61: Maximum discharge, 19,100 cfs June 8, 1952 (gage height, 11.56 ft); minimum daily, 350 cfs Jan. 5, 1944.

Remarks.--Records good except those for period of no gage-height record, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, power development, diversions for irrigation of 68,000 acres above station, and return flow from irrigated areas.

Cooperation.--Gage height record collected in cooperation with The Public Service Co. of Colorado.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Stage-discharge relation affected by ice Nov. 29, 30)

1.7	660	4.0	2,870
2.0	820	5.0	4,250
2.5	1,200	6.0	5,800
3.0	1,660		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,060	862	840	910	1,150	930	855	1,480	5,670	1,560	1,790	1,240
2	1,030	911	900	920	1,160	860	869	1,680	5,400	1,430	1,690	1,260
3	984	*932	1,100	840	1,080	920	820	1,960	4,940	1,320	1,570	1,430
4	1,000	932	1,150	670	1,200	850	1,080	2,070	4,010	1,190	1,340	1,560
5	1,040	925	*1,050	900	1,160	900	1,370	2,160	*3,650	1,260	1,200	1,660
6	*998	932	900	880	1,050	800	1,280	1,790	3,970	1,210	1,090	1,740
7	1,050	925	700	910	1,000	760	1,220	1,580	3,970	1,160	968	1,880
8	1,060	925	800	990	1,060	*745	1,040	1,400	4,250	1,220	1,060	1,880
9	1,100	960	880	1,040	1,040	755	918	1,490	4,620	1,150	1,230	1,980
10	1,010	904	1,060	1,090	920	766	814	*1,560	4,700	1,110	1,170	1,940
11	998	890	1,040	1,130	960	784	890	2,220	3,830	1,060	1,140	1,640
12	1,120	911	980	1,090	960	760	1,030	2,860	3,830	1,070	1,110	1,410
13	1,090	946	900	1,040	920	760	1,070	3,140	3,690	1,060	1,140	1,220
14	1,020	848	800	1,120	960	772	1,100	2,940	3,380	1,110	1,120	*1,120
15	1,120	946	760	1,170	980	820	1,050	2,520	3,170	1,260	*1,230	1,100
16	1,000	925	760	1,100	980	855	918	2,450	3,030	1,280	1,200	1,220
17	883	953	800	1,080	1,070	968	820	2,450	2,960	1,290	1,180	1,310
18	890	925	1,140	1,090	950	925	862	2,640	2,740	1,260	1,320	1,310
19	968	1,100	1,200	1,080	940	869	1,000	2,920	*2,690	1,260	1,240	1,510
20	992	911	1,100	1,070	940	855	*1,340	3,440	2,580	*1,300	1,250	1,610
21	925	827	1,060	1,020	960	848	1,500	3,630	2,490	1,280	1,260	1,660
22	911	911	1,120	1,020	940	897	1,280	*4,110	2,250	1,620	1,240	2,160
23	883	939	1,140	1,060	960	841	1,240	4,540	2,050	1,730	1,220	2,340
24	862	939	1,140	1,100	860	869	1,280	4,800	2,010	1,530	1,180	2,290
25	855	890	1,020	1,160	950	925	1,200	4,680	1,900	1,330	1,180	1,980
26	890	883	980	1,160	910	918	1,060	4,780	1,770	1,180	1,290	2,160
27	883	932	1,100	1,140	810	*796	1,000	5,080	1,640	1,240	1,310	2,250
28	890	814	1,020	1,020	850	802	1,000	5,240	1,610	1,300	1,210	2,280
29	1,080	690	880	950	-	796	1,040	5,100	1,530	1,320	1,180	2,620
30	925	750	820	1,080	-----	808	1,240	5,610	1,610	1,330	1,140	2,960
31	820	-----	840	1,180	-----	827	-----	5,580	-----	1,500	1,170	-----
Total	30,337	27,138	29,980	32,010	27,720	25,981	32,186	97,900	95,940	39,920	38,418	52,720
Mean	979	905	967	1,033	990	838	1,073	3,158	3,198	1,288	1,239	1,757
Ac-ft	60,170	53,830	59,460	63,490	54,980	51,530	63,840	194,200	190,300	79,180	76,200	104,600

Calendar year 1960: Max 7,750 Min 690 Mean 1,908 Ac-ft 1,385,000

Water year 1960-61: Max 5,670 Min 670 Mean 1,453 Ac-ft 1,052,000

\* Discharge measurement made on this day.

Note.--No gage-height record Dec. 1 to Mar. 6 (stage-discharge relation affected by ice during most of period).

## COLORADO RIVER MAIN STEM

g-725. Colorado River at Glenwood Springs, Colo.

Location.--Lat 39°33'00", long 107°19'20", in sec.9, T.6 S., R.89 W., on right bank at powerplant at Glenwood Springs, 10 ft from U. S. Highways 6 and 24 and half a mile upstream from Roaring Fork.

Drainage area.--4,560 sq mi, approximately.

Records available.--May 1899 to September 1961. Prior to October 1918, published as Grand River at Glenwood Springs.

Gage.--Water-stage recorder. Datum of gage is 5,720.71 ft above mean sea level, adjustment of 1912. Prior to Jan. 1, 1900, wire-weight gage at railroad bridge 2,500 ft downstream at different datum. Jan. 1, 1900, to May 16, 1910, staff or float gage at present site and datum.

Average discharge.--62 years, 2,755 cfs (1,995,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,680 cfs May 31 (gage height, 6.97 ft); minimum daily, 680 cfs Nov. 29.  
1899-1961: Maximum discharge, 30,100 cfs June 14, 1918 (gage height, 12.55 ft); minimum daily, 286 cfs Jan. 22, 1935.

Remarks.--Records good. Natural flow of stream affected by transmountain diversions, storage reservoirs, power development, diversions for irrigation of about 70,000 acres, and return flow from irrigated areas. Low flow regulated by Shoshone powerplant 6 miles above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 20-28)

3.0	615	5.0	2,900
3.5	990	6.0	5,120
4.0	1,500	7.0	8,000
4.5	2,090		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.110	836	852	927	1.170	957	828	1.350	6.730	1.760	1.730	1.310
2	1.080	1.020	909	945	1.180	*882	981	1.630	6.340	1.500	1.690	1.340
3	1.040	927	1.120	860	1.110	942	852	1.900	5.720	1.440	1.590	1.420
4	1.040	990	1.160	686	1.240	876	1.030	2.020	4.640	1.370	1.480	1.610
5	1.080	972	*1.070	927	1.170	926	1.250	*2.090	4.010	1.180	1.340	1.710
6	*990	927	927	892	1.070	825	1.350	1.820	4.010	1.320	1.170	1.770
7	1.030	1.020	734	927	1.030	808	1.320	1.680	*4.280	1.280	990	1.860
8	1.040	945	832	1.010	1.080	816	1.280	1.440	4.620	1.260	963	1.920
9	1.140	990	900	1.060	1.050	706	927	1.490	5.020	1.250	1.210	1.970
10	1.030	909	1.090	1.110	945	784	900	1.500	5.150	1.180	1.190	2.040
11	927	927	1.060	1.160	990	870	868	2.160	4.260	1.140	1.170	1.760
12	1.100	884	999	1.110	985	750	1.040	2.830	4.050	1.110	1.150	1.580
13	1.160	900	927	1.060	941	918	1.100	3.180	4.010	1.120	1.150	1.420
14	1.030	927	813	1.140	981	718	1.170	2.990	3.500	1.130	1.120	1.310
15	1.120	868	790	1.190	1.010	858	1.170	2.520	3.240	1.200	1.200	*1.200
16	1.130	999	771	1.130	999	943	1.090	2.380	3.040	1.360	1.290	1.220
17	900	981	806	1.100	1.100	990	836	2.360	3.010	*1.400	*1.240	1.340
18	918	954	1.160	1.110	963	1.010	785	2.520	2.740	1.350	1.300	1.390
19	945	1.020	1.240	1.100	954	918	972	2.670	2.670	1.300	1.400	1.480
20	1.010	1.180	1.110	1.100	960	899	*1.210	3.380	2.580	1.320	1.370	1.650
21	972	936	1.080	1.040	990	943	1.500	3.660	2.460	1.360	1.370	1.740
22	927	860	1.140	1.040	954	918	1.410	4.310	2.260	1.490	1.360	2.130
23	909	963	1.150	1.080	990	1.030	1.320	4.990	2.020	1.720	1.290	2.400
24	884	999	1.150	1.130	892	870	1.300	5.410	2.000	1.600	1.340	2.440
25	868	927	1.030	1.190	972	924	1.310	*5.280	1.920	1.470	1.280	2.130
26	927	892	999	1.180	958	1.080	1.220	5.350	*1.770	1.340	1.320	2.150
27	909	954	1.110	1.160	836	*904	1.050	5.860	1.680	1.200	1.390	2.350
28	909	936	1.030	1.040	877	850	990	6.060	1.630	1.300	1.370	2.430
29	927	680	892	972	-	900	1.140	5.890	1.610	1.370	1.290	2.650
30	990	768	*828	*1.110	-----	844	1.200	6.730	1.490	1.370	1.220	3.140
31	*909	-----	828	1.200	-----	792	-----	6.940	-----	1.380	1.220	-----
Total	3 0.951	2 8.091	3 0.507	3 2.686	2 8.397	2 7.451	3 3.399	1 0.4390	1 0.2460	4 1.570	4 0.193	5 4.860
Mean	998	936	984	1,054	1,014	886	1,113	3,367	3,415	1,341	1,297	1,829
Ac-ft	61,390	55,720	60,510	64,830	56,320	54,450	66,250	207,100	203,200	82,450	79,720	108,800

Calendar year 1960: Max 8,800 Min 680 Mean 2,019 Ac-ft 1,466,000  
Water year 1960-61: Max 6,940 Min 680 Mean 1,520 Ac-ft 1,101,000

\* Discharge measurement made on this day.

9-735. Roaring Fork at Aspen, Colo.

Location.--Lat 39°11'20", long 106°48'55", in sec.7, T.10 S., R.84 W., on right bank at Aspen, three quarters of a mile upstream from Hunter Creek.

Drainage area.--109 sq mi.

Records available.--October 1910 to September 1921, October 1931 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Records since May 24, 1935, are equivalent to prior records if diversion to Twin Lakes tunnel is added to flow past station.

Gage.--Water-stage recorder. Datum of gage is 7,884.58 ft above mean sea level, datum of 1929. Jan. 1, 1911, to Feb. 23, 1915, staff gage at bridge 1,800 ft upstream at different datum. Feb. 24, 1915, to Sept. 30, 1921, staff gage and Apr. 24, 1932, to Oct. 5, 1935, water-stage recorder, at bridge half a mile downstream at different datum.

Average discharge.--41 years, 152 cfs (110,000 acre-ft per year), including diversion by Twin Lakes tunnel.

Extremes.--Maximum discharge during year, 705 cfs June 10 (gage height, 3.23 ft); minimum daily, 7.4 cfs Aug. 24. 1910-21, 1931-61: Maximum discharge, 3,170 cfs June 18, 1917 (gage height, 7.2 ft, site and datum then in use, from floodmarks), from rating curve extended above 1,200 cfs; minimum daily prior to construction of Twin Lakes tunnel, 15 cfs July 15, 16, 1934; minimum daily since diversion through Twin Lakes tunnel, 0.4 cfs Sept. 24, 27, 28, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Transmountain diversion 15 miles upstream through Twin Lakes tunnel to Arkansas River basin since May 24, 1935 (see elsewhere in this report). Salvation ditch diverts water above station for irrigation of about 1,000 acres below.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 2

May 3 to Sept. 30

0.5	7.0	0.6	7.0	1.8	140
.7	13	.9	22	2.0	190
1.0	28	1.1	39	2.5	370
1.4	67	1.4	73	3.0	590
2.0	165				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	27	*22	18	22	20	18	71	482	101	16	14
2	18	26	22	16	22	18	18	95	438	92	19	14
3	*26	27	23	14	22	18	19	*113	306	86	26	31
4	28	27	24	12	20	18	23	112	280	84	17	51
5	30	26	22	*12	20	20	23	100	306	80	15	53
6	28	26	20	14	18	20	21	79	*326	73	12	63
7	28	27	14	18	18	20	22	72	350	66	11	69
8	29	27	20	20	20	*21	20	65	430	63	11	84
9	29	22	24	20	21	*22	19	61	500	57	16	115
10	31	22	24	20	21	18	20	77	555	50	12	124
11	31	24	22	20	21	18	18	120	466	43	11	97
12	31	24	22	20	21	17	19	150	434	39	12	81
13	30	24	20	18	21	17	16	132	414	35	11	*73
14	31	23	19	18	20	18	16	103	378	36	9.4	65
15	33	22	19	20	20	18	18	87	358	37	*8.6	60
16	33	24	14	18	20	18	20	86	362	30	9.8	59
17	33	24	19	16	20	18	20	93	362	24	21	58
18	34	24	22	16	20	18	23	115	310	*21	18	57
19	33	24	22	14	18	18	27	170	286	20	18	69
20	33	22	20	14	18	18	37	220	286	23	12	68
21	34	22	19	16	18	18	37	217	258	33	12	70
22	33	22	22	16	18	18	35	283	224	33	9.8	79
23	33	22	20	18	16	19	40	338	196	22	8.2	89
24	32	22	18	19	16	20	38	*362	180	22	7.4	90
25	28	22	20	20	18	19	*32	390	165	34	14	84
26	26	22	20	19	20	18	31	426	148	20	17	90
27	26	23	22	16	20	18	30	426	132	16	14	92
28	26	22	16	16	20	*18	33	426	*122	14	9.8	95
29	26	20	14	18	-	17	41	414	105	24	8.6	98
30	23	24	14	20	-----	17	56	478	103	40	9.0	93
31	*24	-----	16	*22	-----	17	-----	470	-----	32	17	-----
Total	890	713	615	538	549	572	790	6,351	9,262	1,350	412.6	2,185
Mean	28.7	23.8	19.8	17.4	19.6	18.5	26.3	205	309	43.5	13.3	72.8
Ac-ft	1,770	1,410	1,220	1,070	1,090	1,130	1,570	12,600	18,370	2,680	818	4,330

Calendar year 1960: Max 770 Min 9.1 Mean 81.9 Ac-ft 59,450

Water year 1960-61: Max 555 Min 7.4 Mean 66.4 Ac-ft 48,060

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9-25, Nov. 28 to Dec. 2, Dec. 5-31, Apr. 13-15. No gage-height record Jan. 1 to Mar. 9 (stage-discharge relation affected by ice during most of period).

## ROARING FORK BASIN

9-780. Fryingspan Creek at Norrie, Colo.

Location.--Lat 39°19'50", long 106°39'30", in NE $\frac{1}{4}$  sec.28, T.8 S., R.83 W., on right bank 300 ft south of State Highway 104 at Norrie, 1 mile upstream from North Fork, and 2 miles downstream from Chapman Gulch.

Drainage area.--89.5 sq mi.

Records available.--October 1910 to March 1917, October 1947 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,410 ft (from river-profile map). February 1911 to March 1917 staff gages at site 200 ft upstream at different datums.

Average discharge.--20 years (1910-16, 1947-61), 126 cfs (91,220 acre-ft per year).

Extremes.--Maximum discharge during year, 760 cfs May 29 (gage height, 4.06 ft); minimum daily, 10 cfs Nov. 29, Jan. 28, 29, Feb. 1, 2, 7, 19-22.

1910-17, 1947-61: Maximum discharge, 1,780 cfs June 30, 1957; maximum gage height, 5.55 ft June 28, 1957; minimum daily discharge, 10 cfs Feb. 26, 1957, Feb. 14, 1959, Nov. 29, Jan. 28, 29, Feb. 1, 2, 7, 19-22, 1961, but may have been less during periods of no gage-height record.

Remarks.--Records good except those for periods of ice effect, which are poor. Transmountain diversions above station through Busk-Ivanhoe tunnel to Arkansas River basin since June 1925 (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	19	2.5	108
2.0	30	3.0	270
2.2	49	4.0	730

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	*25	*20	14	10	13	18	83	505	186	103	49
2	25	24	22	12	10	14	18	106	503	168	92	46
3	24	24	24	12	12	14	22	*116	382	153	99	61
4	*23	24	22	14	14	14	30	122	354	150	77	64
5	24	22	20	*14	14	12	28	106	377	144	70	79
6	22	22	18	15	12	12	26	77	*395	130	61	101
7	22	24	11	16	10	12	24	64	431	141	64	116
8	22	27	18	16	12	14	22	58	490	144	58	132
9	22	22	24	16	12	18	20	62	550	119	56	165
10	23	22	22	16	12	*16	20	111	555	106	54	168
11	23	24	20	15	12	12	20	186	508	96	52	130
12	22	24	20	15	12	12	20	223	485	90	52	111
13	22	24	17	14	12	12	20	207	440	81	52	*96
14	24	24	15	14	12	14	16	138	418	81	47	85
15	24	22	16	15	12	16	16	122	395	79	*44	79
16	25	22	12	15	12	18	16	132	382	70	46	77
17	25	22	13	15	12	18	20	159	372	66	72	83
18	28	22	18	14	12	18	26	207	359	*62	61	81
19	26	24	18	14	10	18	56	282	346	61	46	106
20	26	22	17	12	10	18	70	334	334	66	41	116
21	25	20	14	12	10	16	50	338	330	99	48	108
22	25	22	18	14	10	16	54	413	306	81	41	130
23	25	20	18	14	11	17	50	480	266	61	36	138
24	24	20	14	14	12	19	42	*498	252	58	38	144
25	24	20	17	15	11	18	*36	476	242	62	72	130
26	23	20	16	14	12	17	30	508	224	64	79	130
27	23	22	18	12	12	16	29	550	*210	66	52	130
28	24	18	12	10	12	*16	33	565	218	61	44	141
29	24	10	12	10	-	16	46	590	204	62	40	147
30	20	22	14	12	-----	16	68	620	196	58	42	130
31	22	-----	16	*12	-----	16	-----	585	-----	90	56	-----
Total	736	660	536	427	324	478	946	8523	11129	2955	1795	3275
Mean	23.7	22.0	17.3	13.8	11.6	15.4	31.5	275	371	95.3	57.9	109
Ac-ft	1,460	1,310	1,060	847	643	948	1,880	16,910	22,070	5,860	3,560	6,500

Calendar year 1960: Max 705 Min 10 Mean 104 Ac-ft 75,820  
 Water year 1960-61: Max 620 Min 10 Mean 87.1 Ac-ft 63,050

Peak discharge (base, 760 cfs)--May 29 (10 p.m.) 760 cfs (4.06 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31, Nov. 2, Nov. 10 to Apr. 23 (no gage-height record Jan. 3, 4, 26-31, Mar. 10-21).



9-785. North Fork Fryingpan Creek near Norrie, Colo.

Location.--Lat 39°20'40", long 106°39'50", in N½ sec.21, T.8 S., R.83 W., on left bank 1,000 ft upstream from bridge on State Highway 104, a quarter of a mile upstream from mouth, half a mile downstream from Last Chance Creek, and 1 mile northwest of Norrie.

Drainage area.--41.2 sq mi.

Records available.--October 1910 to March 1917, October 1947 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,400 ft (from topographic map). Feb. 18, 1911, to Mar. 31, 1917, staff gage at site 10 ft downstream at different datum. Oct. 1, 1947, to Sept. 30, 1949, water-stage recorder at present site at datum 2.00 ft higher.

Average discharge.--20 years (1910-16, 1947-61), 53.2 cfs (38,520 acre-ft per year).

Extremes.--Maximum discharge during year, 300 cfs June 10 (gage height, 3.90 ft); minimum daily, 2.4 cfs Oct. 8, 9. 1910-17, 1947-61: Maximum discharge, 1,320 cfs June 6, 1958, from rating curve extended above 700 cfs; maximum gage height, 5.80 ft May 21, 1948 (present datum); minimum daily discharge, 0.5 cfs Nov. 1, 1950.

Remarks.--Records good except those for period of ice effect, which are poor. One small diversion bypasses station for development of power for private use.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	2.0	2.6	25	3.3	113
2.0	3.5	2.8	39	3.6	195
2.2	9.0	3.0	61	3.8	270

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	*5.5	(*)				4.0	45	262	68	22	11
2	2.9	5					4.2	55	230	53	18	11
3	3.0	5					5	*59	180	46	20	17
4	*2.9	5					7	60	159	41	15	20
5	3.0	5		(*)			6.5	55	170	43	14	28
6	2.8	4.5					5.5	37	*176	37	12	44
7	2.6	5					5.5	30	202	36	11	56
8	2.4	5.5					5	27	238	34	9.9	68
9	2.4	5					4.6	30	266	30	9.3	102
10	3.4	4.5				(*)	4.6	57	266	27	8.7	115
11	3.4						4.6	98	262	24	7.8	69
12	3.2						4.6	132	262	22	7.2	47
13	3.0						4.4	109	238	20	7.8	*37
14	3.4						4.0	62	216	20	6.9	30
15	4.8						4.0	47	192	20	*6.3	26
16	4.8		4	3.5	3.5	4	4.0	48	183	18	6.3	24
17	5.2						4.0	57	183	17	12	25
18	5.8						8	98	170	*15	12	24
19	5.2						14	150	170	14	9.6	32
20	6.0	4.5					18	189	167	16	8.1	42
21	4.8						16	189	159	22	9.3	42
22	4.2						16	212	135	20	8.1	49
23	3.8						16	212	109	15	6.6	55
24	3.8						18	*202	100	14	5.8	57
25	4.2						*17	192	87	13	7.8	51
26	4.0						16	230	78	14	17	65
27	4.0						14	254	*69	14	14	65
28	4.8					(*)	18	250	90	13	10	71
29	5.0						24	254	67	12	8.7	74
30	4.2						36	262	64	11	9.0	56
31	5.5	-----		(*)	-----		-----	254	-----	17	12	-----
Total	121.3	140.0	124	108.5	98.0	124	312.5	3,956	5,150	766	332.2	1,413
Mean	3.91	4.67	4	3.5	3.5	4	10.4	128	172	24.7	10.7	47.1
Ac-ft	241	278	246	215	194	246	620	7,850	10,210	1,520	659	2,800

Calendar year 1960: Max 594 Min 2.3 Mean 47.7 Ac-ft 34,650

Water year 1960-61: Max 266 Min 2.4 Mean 34.6 Ac-ft 25,080

Peak discharge (base, 420 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31 to May 1 (no gage-height record Nov. 1 to Mar. 31, Apr. 7-18).

## ROARING FORK BASIN

9-802. Fryingpan Creek at Ruedi, Colo.

Location.--Lat 39°21'40", long 106°49'10", in NW<sup>1</sup> sec.18, T.8 S., R.84 W., on right bank 200 ft upstream from Rocky Fork, half a mile downstream from Ruedi Creek, and 1 mile west of Ruedi.

Drainage area.--223 sq mi.

Records available.--October 1959 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,500 ft (from river-profile map).

Extremes.--Maximum discharge during year, 1,440 cfs May 30 (gage height, 4.09 ft); minimum daily, 25 cfs Mar. 11, 12.  
1959-61: Maximum discharge, 1,790 cfs June 5, 1960; minimum daily, that of Mar. 11, 12, 1961.

Remarks.--Records good except those for period of no gage-height record, which are poor. Diversions for irrigation of several hundred acres and small transmountain diversions above station to Arkansas River basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	21	2.6	215
1.7	40	3.0	410
2.0	75	3.5	820
2.3	125	4.0	1,340

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	*49	*44	34	30	32	33	135	1,180	282	123	85
2	47	46	44	34	30	32	33	174	1,060	247	117	78
3	47	49	44	34	32	34	36	*198	775	219	128	95
4	*47	53	44	32	34	32	48	208	676	204	107	107
5	47	53	44	*30	34	30	51	198	703	212	102	115
6	46	50	38	32	32	28	47	145	*703	194	94	156
7	44	56	36	34	30	28	46	125	766	187	94	187
8	43	53	38	36	32	30	41	113	910	190	92	223
9	44	48	44	36	32	*34	37	113	1,050	159	89	273
10	46	49	44	36	32	26	39	171	1,090	150	83	315
11	46	50	44	36	32	25	37	300	1,000	135	82	260
12	42	50	44	36	32	25	38	392	970	125	79	204
13	40	50	40	36	32	26	42	356	880	121	78	*171
14	41	50	40	36	32	27	39	251	802	117	74	148
15	44	46	40	36	32	29	36	204	739	115	*67	132
16	44	46	36	36	32	31	36	208	694	107	66	123
17	46	46	36	36	32	31	41	239	685	102	88	132
18	48	46	38	36	32	31	52	300	649	*100	86	125
19	49	46	40	36	30	30	68	459	632	89	81	153
20	51	46	40	34	30	31	83	616	616	92	74	174
21	48	44	36	30	30	29	82	616	592	115	79	174
22	46	40	36	30	30	29	82	757	544	113	74	215
23	47	40	38	30	30	34	92	820	466	94	68	247
24	46	40	40	30	32	41	89	*870	417	88	65	255
25	43	40	40	30	30	39	*74	820	392	86	89	231
26	42	40	40	30	32	33	62	890	362	86	105	231
27	41	40	40	30	32	31	62	1,020	*330	88	92	239
28	46	38	36	30	32	*29	68	1,070	345	83	81	264
29	46	36	34	30	-	30	86	1,090	315	89	74	278
30	38	42	34	34	-----	33	117	1,200	291	82	70	247
31	41	-----	34	*32	-----	*32	-----	1,140	-----	100	91	-----
Total	1,392	1,382	1,226	1,032	882	952	1,697	15,198	20,634	4,171	2,692	5,637
Mean	44.9	46.1	39.5	33.3	31.5	30.7	56.6	490	688	135	86.8	188
Ac-ft	2,760	2,740	2,430	2,050	1,750	1,890	3,370	30,140	40,930	8,270	5,340	11,180

Calendar year 1960: Max 1,470 Min 28 Mean 201 Ac-ft 145,600

Water year 1960-61: Max 1,200 Min 25 Mean 156 Ac-ft 112,800

Peak discharge (base, 1,500 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 11 to Mar. 9 (stage-discharge relation affected by ice most of period).

## 9-815.5. Crystal River at Placita, Colo.

Location--Lat 39°08'30", long 107°15'20", in SE $\frac{1}{4}$  sec. 31, T.10 S., R.88 W., on right bank 0.1 mile downstream from highway bridge, 0.4 mile upstream from Bears Gulch, 0.7 mile north of Placita, and 3 miles upstream from Coal Creek.

Drainage area--107 sq mi.

Records available--October 1959 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 7,380 ft (from river-profile map).

Extremes--Maximum discharge during year, 1,500 cfs June 9 (gage height, 5.49 ft); minimum daily, 20 cfs, Mar. 6, 12.  
1959-61: Maximum discharge, that of June 9, 1961; minimum daily, that of Mar. 6, 12, 1961.

Remarks--Records good except those for period of ice effect, which are poor. A few small diversions above station for irrigation of hay meadows.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	15	2.6	68	4.0	420
2.2	28	3.0	128	4.5	680
2.3	36	3.5	250	5.3	1,320

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	*43	49	34	26	24	29	155	1,200	320	115	64
2	54	42	*52	32	28	24	29	*229	1,050	307	115	64
3	*53	42	48	28	30	*26	33	265	806	289	128	79
4	52	43	36	26	30	24	44	277	708	286	114	76
5	51	41	34	*28	30	24	44	217	729	271	109	83
6	50	40	30	30	26	20	41	175	729	262	102	85
7	49	49	28	30	22	22	42	157	*729	235	96	85
8	48	47	36	32	22	24	38	142	908	223	90	86
9	49	43	42	32	24	26	34	142	1,170	209	93	126
10	50	43	40	32	24	22	34	200	1,280	192	88	232
11	56	45	38	32	24	21	31	301	1,200	175	82	157
12	53	44	40	30	24	20	31	366	1,160	161	82	120
13	50	43	34	30	24	21	35	338	1,110	155	81	*101
14	51	42	32	32	24	24	31	259	972	146	*79	92
15	53	41	32	32	24	30	30	220	900	141	76	82
16	51	44	28	32	24	30	30	226	940	137	82	81
17	51	47	32	30	26	32	34	259	900	132	86	93
18	51	44	42	30	24	30	46	342	852	*128	75	117
19	50	40	38	30	22	27	58	490	828	125	71	168
20	49	36	36	30	22	27	82	584	799	122	68	150
21	47	38	32	30	24	26	69	584	778	126	69	155
22	46	37	38	32	24	27	66	806	708	115	67	244
23	45	36	36	30	24	32	78	*940	620	109	61	250
24	44	36	32	30	22	41	*74	892	560	106	62	212
25	43	34	34	30	24	38	64	932	525	104	75	178
26	42	34	34	28	24	32	57	1,050	490	104	72	170
27	42	37	36	28	24	30	52	1,130	452	115	67	180
28	43	38	32	26	26	28	54	1,180	412	107	63	185
29	44	36	30	24	-	*27	75	1,130	*380	107	60	185
30	40	53	30	30	-----	27	115	1,190	359	112	61	164
31	41	-----	32	*28	-----	27	-----	*1,200	-----	129	64	-----
Total	1,502	1,238	1,113	928	692	833	1,480	16,378	24,254	5,250	2,553	4,064
Mean	48.5	41.3	35.9	29.9	24.7	26.9	49.3	528	808	169	82.4	135
Ac-ft	2,980	2,460	2,210	1,840	1,370	1,650	2,940	32,490	48,110	10,410	5,060	8,060

Calendar year 1960: Max 1,220 Min 22 Mean 182 Ac-ft 132,500  
Water year 1960-61: Max 1,280 Min 20 Mean 165 Ac-ft 119,600

Peak discharge (base, 1,200 cfs)--May 27 (10 p.m.) 1,430 cfs (5.41 ft); June 9 (10 p.m.) 1,500 cfs (5.49 ft).

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Dec. 6 to Mar. 10 (no gage-height record Dec. 20 to Mar. 3).

## ROARING FORK BASIN

9-816. Crystal River above Avalanche Creek, near Redstone, Colo.

Location.--Lat 39°14', long 107°14', in SW $\frac{1}{4}$  sec.33, T.9 S., R.88 W., on right bank  $1\frac{1}{4}$  miles upstream from Avalanche Creek and  $3\frac{1}{2}$  miles north of Redstone.

Drainage area.--167 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,905 ft (from river-profile map).

Average discharge.--6 years, 285 cfs (206,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,270 cfs June 9 (gage height, 4.72 ft); minimum daily, 29 cfs Feb. 6, 7.  
1955-61: Maximum discharge, 3,980 cfs July 1, 1957 (gage height, 5.65 ft); minimum daily, 22 cfs Dec. 5, 1955.

Remarks.--Records good. A few small diversions for irrigation above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 9 to Sept. 30)

0.9	19	2.0	280
1.0	31	2.5	505
1.2	60	3.0	840
1.4	102	4.0	1,750

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	*57	49	43	35	32	50	312	1,540	386	158	76
2	66	55	*52	40	35	36	50	*405	1,300	355	139	76
3	*64	55	58	36	39	*34	54	478	1,010	331	172	107
4	64	57	55	*34	41	36	78	472	882	323	147	104
5	64	55	50	35	39	36	78	360	889	304	144	107
6	62	55	44	38	29	36	70	287	896	301	124	112
7	60	70	36	38	29	32	76	252	*903	273	116	109
8	58	68	47	40	38	35	66	228	1,110	262	112	109
9	62	58	57	41	35	38	57	231	1,500	256	112	163
10	64	55	54	41	35	39	58	327	1,700	238	104	287
11	78	58	49	41	35	36	54	494	1,530	220	100	204
12	74	58	50	39	35	36	55	630	1,450	204	98	158
13	68	58	43	39	36	38	62	535	1,350	192	98	134
14	72	58	41	39	35	44	60	373	1,180	183	*95	*116
15	78	57	44	41	34	55	47	315	1,090	177	91	104
16	74	50	36	40	36	60	49	315	1,110	172	98	100
17	72	52	40	39	35	62	55	355	1,060	163	107	114
18	74	54	54	39	35	55	78	494	1,010	158	91	158
19	72	57	50	38	30	50	102	728	990	152	84	231
20	70	52	44	39	34	47	147	812	958	*149	80	195
21	68	50	40	38	34	46	119	819	926	155	78	214
22	66	52	50	41	34	47	112	1,090	854	144	76	343
23	66	50	46	38	36	54	131	*1,220	756	134	70	420
24	64	50	40	39	30	68	*121	1,190	679	129	105	319
25	62	49	44	39	35	68	107	1,240	624	124	116	252
26	60	49	43	36	36	57	93	1,340	584	121	95	245
27	60	52	49	36	34	52	87	1,460	*535	136	84	248
28	60	49	38	34	35	50	100	1,520	488	126	76	256
29	64	35	38	31	-	*50	158	1,430	*461	126	74	256
30	57	52	39	39	-----	52	238	1,500	435	139	76	217
31	54	-----	39	*36	-----	50	-----	1,510	-----	142	80	-----
Total	2,043	1,627	1,419	1,187	974	1,431	2,612	22,722	29,800	6,275	3,200	5,534
Mean	65.9	54.2	45.8	38.3	34.8	46.2	87.1	733	993	202	103	184
Ac-ft	4,050	3,230	2,810	2,350	1,930	2,840	5,180	45,070	59,110	12,450	6,350	10,980

Calendar year 1960: Max 1,550 Min 30 Mean 248 Ac-ft 180,200  
Water year 1960-61: Max 1,700 Min 29 Mean 216 Ac-ft 156,400

Peak discharge (base, 2,000 cfs).--May 27 (11 p.m.) 2,030 cfs (4.45 ft); June 9 (10:30 p.m.) 2,270 cfs (4.72 ft).

\* Discharge measurement made on this day.



9-825. Crystal River near Redstone, Colo.

Location.--Lat 39°18', long 107°13', in NE $\frac{1}{4}$  sec.9, T.9 S., R.88 W., on right bank 20 ft downstream from private bridge, 75 ft downstream from Nettle Creek, and 7 miles north of Redstone.

Drainage area.--220 sq mi.

Records available.--May 1935 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 6,483.77 ft above mean sea level, datum of 1929. Prior to Oct. 21, 1946, water-stage recorder at same site and datum. Oct. 21, 1946, to Aug. 28, 1957, at site 1 mile downstream at different datum.

Average discharge.--26 years, 353 cfs (255,600 acre-ft per year).

Extremes.--Maximum discharge during year, 2,350 cfs May 28 (gage height, 5.49 ft); minimum daily, 45 cfs Feb. 6, 7.

1955-61: Maximum discharge, 4,400 cfs June 21, 1958, from rating curve extended above 2,400 cfs; maximum gage height, 9.24 ft July 1, 1957 (site and datum then in use); minimum daily discharge, 16 cfs Oct. 9, 1956.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions above station for irrigation of about 115 acres above and about 2,040 acres below station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	*81	74	60	55	55	64	322	1,870	478	190	52
2	53	81	*81	55	55	60	65	*432	1,570	442	182	58
3	*53	83	86	55	60	*70	68	491	1,220	398	255	97
4	51	84	83	50	60	65	92	505	1,080	398	220	88
5	50	84	78	55	55	65	99	386	1,060	370	215	97
6	49	83	65	*60	45	65	92	290	1,100	354	175	100
7	47	102	55	60	45	58	97	249	*1,080	302	160	100
8	46	100	65	60	50	60	94	205	1,330	294	124	107
9	47	89	78	65	55	58	88	202	1,680	269	104	203
10	50	83	81	65	55	65	86	326	1,890	249	94	378
11	64	86	74	65	55	63	83	530	1,800	220	88	252
12	58	89	74	60	55	60	77	700	1,740	205	88	192
13	52	88	65	60	60	64	84	615	1,560	190	84	160
14	60	86	60	60	55	72	78	437	1,480	178	*75	*139
15	60	86	60	60	60	84	67	354	1,310	172	71	123
16	58	78	55	60	60	91	60	346	1,360	170	81	114
17	70	78	60	60	60	91	65	402	1,320	160	102	130
18	107	80	75	55	60	83	88	540	1,250	155	74	203
19	102	81	74	55	55	72	112	784	1,230	146	63	306
20	100	77	60	55	55	70	165	929	1,200	*141	62	255
21	97	75	60	55	60	67	137	929	1,180	143	58	266
22	94	77	74	60	60	67	128	1,320	1,090	130	57	464
23	92	75	68	60	60	72	132	*1,530	978	117	50	530
24	92	74	60	60	55	86	*141	1,520	874	114	83	432
25	91	74	60	60	60	86	128	1,530	808	110	119	338
26	89	74	60	55	65	71	*114	1,660	760	108	89	318
27	88	80	65	55	60	64	107	1,810	*685	124	70	330
28	89	74	55	50	60	64	115	1,830	620	115	59	330
29	91	55	55	50	-	*63	170	1,700	*595	121	54	330
30	80	75	55	60	-----	63	255	1,800	555	139	54	286
31	78	-----	60	*55	-----	65	-----	1,760	-----	163	58	-----
Total	2,211	2,432	2,075	1,795	1,590	2,139	3,151	26,434	36,275	6,675	3,258	6,778
Mean	7.13	81.1	66.9	57.9	56.8	69.0	105	853	1,209	215	105	226
Ac-ft	4,390	4,820	4,120	3,560	3,150	4,240	6,250	52,430	71,950	13,240	6,460	13,440

Calendar year 1960: Max 1,880 Min 38 Mean 291 Ac-ft 211,400  
 Water year 1960-61: Max 1,890 Min 45 Mean 260 Ac-ft 188,000

Peak discharge (base, 2,000 cfs).--May 28 (12:30 a.m.) 2,350 cfs (5.49 ft); June 9 (12 p.m.) 2,270 cfs (5.40 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29, Dec. 6-8, 13-17, 20, 21, Dec. 24 to Mar. 3 (no gage-height record Jan. 5 to Mar. 3).

## ROARING FORK BASIN

9-846. Fourmile Creek near Glenwood Springs, Colo.

Location.--Lat 39°24', long 107°19', in W $\frac{1}{2}$  sec. 34, T.7 S., R.89 W., on left bank 100 ft below National Forest boundary, 3 miles upstream from Freeman Creek, 6 miles west of Carbondale, 8 miles upstream from mouth, and 10 miles south of Glenwood Springs.

Drainage area.--16.7 sq mi.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 131 cfs May 11 (gage height, 4.61 ft); minimum daily, 0.2 cfs Aug. 14, 15, 20, 22, 23, 1957-61; Maximum discharge, that of May 11, 1961; minimum daily, 0.1 cfs Sept. 5, 7-11, 1959.

Remarks.--Records good except those for periods of ice effect, which are fair. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 2-5, June 22 to Aug. 2, Sept. 8-30)

2.7	0.2	3.4	7.0
2.8	.4	3.5	10
2.9	.7	3.7	24
3.0	1.2	4.0	54
3.2	3.0	4.3	91

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.6	0.4	0.4	0.6	0.4	0.8	3.7	2.7	1.9	0.6	0.4
2	.3	.6	.4	.4	.6	*.4	.8	5.0	2.5	1.5	2.0	.4
3	.3	.6	.5	.4	.6	.4	1.4	*5.1	2.1	1.6	.9	.8
4	*.3	.6	.5	.4	.6	.4	2.4	4.5	2.0	1.4	.6	1.1
5	.3	.6	.5	.5	.6	.4	2.7	2.9	1.8	1.2	.5	1.2
6	.3	.5	.5	.5	.6	.4	2.8	1.7	1.7	1.1	.4	1.5
7	.3	.5	.4	.4	.6	.4	2.4	1.3	1.5	1.1	.3	1.0
8	.3	.5	.4	.5	.6	.4	2.8	1.4	*1.4	1.0	.3	.8
9	.3	.5	.5	.5	.5	.4	3.4	2.6	1.3	.8	.3	1.0
10	.4	.5	.5	.5	.5	.4	1.9	5.9	1.1	.8	.3	1.0
11	.4	.6	.4	.5	.5	.5	1.6	8.6	9.7	.8	.3	*.7
12	.4	.6	.4	.6	.4	.5	1.7	8.1	8.7	.7	.3	.5
13	.3	.6	.4	.6	.4	.5	1.6	6.5	8.0	.6	.3	.4
14	.5	.6	.4	.6	.4	.6	1.2	4.6	7.0	.6	*.2	.4
15	.6	.6	.4	.5	.4	.7	1.4	4.3	6.8	.6	.2	.4
16	.6	.5	.3	.5	.4	.7	1.4	4.7	5.9	.5	.3	.5
17	.6	.5	.4	.5	.4	.7	1.8	5.3	5.7	*.5	.3	.8
18	.6	.5	.4	.5	.4	.7	3.4	6.2	5.2	.5	.3	.8
19	.6	.5	.4	.6	.4	.7	5.9	6.8	5.0	.5	.3	2.0
20	.6	.5	.4	.6	.4	.7	1.0	6.4	4.1	.5	.2	1.2
21	.5	.5	.4	.5	.4	.6	9.4	5.9	3.7	.6	.3	1.6
22	.5	.5	.4	.4	.5	.7	8.7	5.8	3.4	.6	.2	3.7
23	.5	.4	.4	.5	.5	.8	1.5	*5.4	3.2	.5	.2	3.9
24	.5	.4	.4	.6	.5	1.0	*9.0	4.7	2.8	.5	.3	4.6
25	.5	.4	.4	.6	.5	1.2	6.3	4.2	2.7	.5	.6	2.9
26	.5	.4	.4	.6	.4	1.0	4.3	4.1	*2.3	.5	.4	3.4
27	.5	.5	.4	.6	.4	*.8	4.1	3.8	2.2	.4	.4	2.8
28	.5	*.4	.4	.6	.4	.7	6.3	3.7	2.1	.4	.3	2.6
29	.6	.3	.4	.6	-	.7	1.7	3.4	2.1	.4	.3	4.3
30	.5	.5	*.4	*.6	-----	.7	3.0	3.5	2.0	.5	.3	4.1
31	*.5	-----	.4	.6	-----	.8	-----	3.1	-----	.5	.4	-----
Total	13.9	15.3	12.9	16.2	13.5	19.3	161.5	1.432	273.6	23.6	12.6	50.8
Mean	0.45	0.51	0.42	0.52	0.48	0.62	5.38	46.2	9.12	0.76	0.41	1.69
Ac-ft	28	30	26	32	27	38	320	2,840	543	47	25	101

Calendar year 1960: Max 88 Min 0.2 Mean 7.12 Ac-ft 5,170  
Water year 1960-61: Max 86 Min 0.2 Mean 5.60 Ac-ft 4,060

Peak discharge (base, 60 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-2	6p.m.	4.35	82	5-18	8p.m.	4.18	79
5-11	5:30p.m.	4.61	131				

\* Discharge measurement made on this day.  
Note.--Stage-discharge relation affected by ice Nov. 7-10, 29, Dec. 7, 8, 13-19, Jan. 4-7, 13, 20-25.

9-850. Roaring Fork at Glenwood Springs, Colo.

Location.--Lat 39°32'50", long 107°19'50", in sec.9, T.6 S., R.89 W., on left bank at Glenwood Springs, 1,500 ft upstream from mouth.

Drainage area.--1,460 sq mi, approximately.

Records available.--October 1905 to September 1909, September 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 5,720.73 ft above mean sea level, adjustment of 1912. Prior to Nov. 20, 1915, chain gage on highway bridge 800 ft downstream at different datum. Nov. 20, 1915, to Oct. 26, 1917, staff gage at present site and datum.

Average discharge.--55 years, 1,399 cfs (1,013,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,660 cfs June 10 (gage height, 4.78 ft); minimum daily, 284 cfs Feb. 24.  
1905-9, 1910-61: Maximum discharge, 19,000 cfs July 1, 1957; maximum gage height, 8.7 ft June 14, 1921, from floodmarks;  
minimum discharge, 145 cfs Jan. 21, 1935 (gage height, 0.65 ft); minimum daily, 179 cfs Jan. 21, 1935.

Remarks.--Records good. Diversions above station for irrigation of about 35,000 acres. Transmountain diversions to Arkansas River basin through Busk-Ivanhoe tunnel since 1925 and through Twin Lakes tunnel since 1935 (see elsewhere in this report).

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.8	260	3.0	2,280
1.1	360	4.0	4,030
1.5	580	4.5	5,040
2.0	1,010		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	430	498	440	380	324	302	336	812	4,940	1,690	620	492
2	425	498	435	340	314	311	336	1,000	4,630	1,560	612	480
3	435	486	468	320	320	317	332	1,190	3,430	1,430	820	636
4	425	480	462	317	320	311	384	1,290	2,920	1,370	700	756
5	425	480	445	324	311	311	400	1,190	2,840	1,350	660	772
6	425	474	396	352	299	311	376	940	2,890	1,320	612	838
7	425	504	356	388	299	305	384	829	2,870	1,190	566	856
8	435	524	392	405	324	*296	384	*772	*3,340	1,190	517	910
9	440	498	445	400	317	296	356	676	4,330	1,060	492	1,050
10	456	462	440	410	311	324	360	780	4,960	970	474	1,490
11	462	462	420	388	317	317	352	1,260	4,630	901	440	1,310
12	468	474	392	380	332	317	332	1,780	4,470	812	450	1,100
13	462	480	384	380	*332	308	348	1,780	4,190	740	456	980
14	498	474	372	388	324	324	344	1,350	3,750	684	445	865
15	524	480	372	388	314	352	314	1,080	3,470	652	420	*812
16	510	435	344	360	320	372	324	990	3,350	620	430	764
17	510	440	360	340	324	405	*317	1,060	3,320	559	*492	772
18	573	450	435	348	311	380	344	1,290	3,170	545	504	764
19	580	474	415	340	296	348	392	1,780	3,080	531	474	1,030
20	573	468	392	317	305	348	498	2,360	3,040	*524	462	1,000
21	580	450	372	314	311	348	504	2,270	2,940	588	456	1,030
22	573	462	415	332	308	324	462	2,780	2,810	604	445	1,320
23	559	450	392	328	317	336	510	3,260	2,540	559	430	1,640
24	552	445	368	*340	284	364	517	3,390	2,360	510	425	1,620
25	545	450	368	344	311	380	492	*3,390	2,240	510	510	1,350
26	524	450	368	340	317	360	440	3,610	*2,140	492	524	1,350
27	510	462	405	332	302	340	425	3,990	2,040	492	480	1,300
28	510	*440	360	305	308	*344	425	4,590	1,990	486	474	1,320
29	517	364	330	302	-	328	492	4,310	1,860	498	440	1,400
30	504	420	*330	*332	-----	332	668	4,770	1,770	531	445	1,340
31	*486	-----	340	320	-----	332	-----	4,670	-----	524	462	-----
Total	15,341	13,934	12,213	10,854	8,772	10,343	12,148	65,239	96,310	25,492	15,737	31,347
Mean	495	464	394	350	313	334	405	2,104	3,210	822	508	1,045
Ac-ft	30,430	27,640	24,220	21,530	17,400	20,520	24,100	129,400	191,000	50,560	31,210	62,180

Calendar year 1960: Max 6,080 Min 280 Mean 1,033 Ac-ft 750,200

Water year 1960-61: Max 4,960 Min 284 Mean 870 Ac-ft 630,200

Peak discharge (base, 6,300 cfs).--No peak above base.

\* Discharge measurement made on this day.

## GARFIELD CREEK BASIN

g-880. Baldy Creek near New Castle, Colo.

Location.--Lat 39°29', long 107°30', in NE¼ sec.36, T.6 S., R.91 W., on left bank 100 ft upstream from diversion headgate, 2.3 miles above mouth, and 6 miles southeast of New Castle.

Drainage area.--16.1 sq mi.

Records available.--October 1955 to September 1961 (discontinued).

Gage.--Water-stage recorder.

Average discharge.--6 years, 5.30 cfs (3,840 acre-ft per year).

Extremes.--Maximum discharge during year, 52 cfs May 23 (gage height, 4.10 ft); no flow for many days.  
1955-61: Maximum discharge, 242 cfs June 2, 1957 (gage height, 5.80 ft); no flow at times in each year.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. One small diversion above station for irrigation below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 22 to Nov. 26, Apr. 17-25, May 23 to June 5, June 17 to July 18, July 21, 22, Sept. 4-12)

2.2	0	2.6	0.6	3.6	16
2.3	.1	2.8	1.8	4.0	38
2.4	.2	3.0	3.7	4.2	52
2.5	.4	3.3	8.7		

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	0.2			0.2	0.8	9.8	22	0.6		0
2	0	.1	*.4			.2	.9	12	19	.4		0
3	0	*.1	.4			*.3	1.4	12	18	.3		0
4	0	.1	.3			.4	2.4	11	16	.4		2
5	0	.1	.2			.4	2.3	9.8	*15	.4		2
6	0	.1	.2	(*)		.4	2.4	7.6	14	.3		.4
7	*0	.2	.2			.4	1.6	7.2	12	.3		.2
8	0	.3	.2			.4	1.3	*6.8	11	.3		.2
9	0	.2	.2			.4	1.4	9.1	11	.2		.3
10	0	.2	.2			.4	.7	14	9.1	.2		.2
11	0	.2	.2			.4	.6	19	8.1	.2		*.2
12	0	.2	.2			.4	.7	24	7.0	.2		.1
13	0	.2	.2			.4	1.0	20	6.2	.2		.1
14	0	.2	.2			.6	.6	15	5.4	.1		0
15	0	.2	.2	0.1	0.2	.8	.8	14	4.4	.1		0
16	0	.2	.2			1.0	.8	16	3.8	.1		0
17	0	.2	.2			1.1	1.0	18	3.0	*.1	(*)	0
18	.1	.2	.2			1.0	2.3	26	2.5	.1		.1
19	.1	.2	.2			2.8	4.4	3.7	2.1	0		.4
20	.1	.2	.2			.8	5.7	41	*1.7	0		.4
21	.1	.2	.2			2.0	3.2	41	1.5	.1		.4
22	.1	.2	.2			2.4	3.3	42	1.3	.1		1.4
23	.1	.2	.2			1.9	*4.4	44	1.2	0		1.7
24	.1	.2	.2			1.8	2.7	42	1.0	0		2.3
25	.1	.2	.2			2.0	2.1	*3.7	.8	0		1.1
26	.1	.3	.2			1.6	1.7	34	.8	0		1.1
27	.1	.2	.2			*1.0	1.4	31	.6	0		1.0
28	.1	.2	.2			1.1	2.0	28	.6	0		.9
29	.1	.2	.2			.7	4.9	2.7	.6	0		1.5
30	.1	.2	.2	(*)	-----	1.3	8.3	2.7	.7	0		1.6
31	.1	-----	.2		-----	1.4	-----	2.5	-----	0		-----
Total	1.4	5.6	6.7	3.1	5.6	30.0	67.1	707.3	200.4	4.7	0	16.0
Mean	0.05	0.19	0.22	0.1	0.2	0.97	2.24	22.8	6.68	0.15	0	0.53
Ac-ft	2.8	11	13	6.1	11	60	133	1,400	397	9.3	0	32

Calendar year 1960: Max 54 Min 0 Mean 3.93 Ac-ft 2,850  
Water year 1960-61: Max 44 Min 0 Mean 2.87 Ac-ft 2,080

Peak discharge (base, 40 cfs).--May 23 (1 a.m.) 52 cfs (4.10 ft).

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 27 to Dec. 8, Mar. 19, 21-23, 26-31. No gage-height record Dec. 9 to Mar. 3 (stage-discharge relation affected by ice during most of period).



9-895. West Divide Creek near Raven, Colo.

Location.--Lat 39°20', long 107°35', in W $\frac{1}{2}$  sec. 29, T.8 S., R.91 W., on left bank 10 ft downstream from private road bridge, 0.8 mile upstream from Brook Creek, 8 miles south of Raven, and 16 miles south of Silt.

Drainage area.--65.8 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder.

Average discharge.--6 years, 26.3 cfs (19,040 acre-ft per year).

Extremes.--Maximum discharge during year, 220 cfs May 21 (gage height, 4.15 ft); no flow for many days.  
1955-61: Maximum discharge, 535 cfs June 4, 1957 (gage height, 5.04 ft); no flow at times in most years.

Remarks.--Records good except those for periods of ice effect, indefinite stage-discharge relation, or no gage-height record, which are poor. Natural flow of stream affected by water diverted from Thompson Creek (Roaring Fork basin), Muddy Creek (Muddy Creek basin), and Buzzard Creek (Plateau Creek basin).

Cooperation.--One discharge measurement furnished by Bureau of Reclamation.

Rating table, water year 1960-61, except periods of ice effect or indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 11-17)

1.8	0	2.4	7.0
1.9	.3	2.7	19
2.1	1.8	3.0	40
2.2	2.8	3.5	93
2.3	4.5	4.0	183

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.4	0.9		(*)		4.3	83	128	12	0.7	0
2	0	.6	.9				5.2	101	124	9.1	1.0	.5
3	0	*.9	.9				7.7	106	101	6.8	3.6	1.6
4	0	.7	1.0				13	98	92	6.2	1.4	2.8
5	0	.7	1.0				14	78	92	5.2	.9	2.2
6	**0	.7	.9		(*)	0.6	12	59	99	5.2	.7	5.0
7	0	1.0	.9				13	52	98	6.0	.2	2.8
8	0	.9	.9				10	52	96	4.2	.1	2.3
9	.1	.8	.9				10	61	96	3.8	0	4.2
10	.2	.8	1.0				6.5	*103	104	3.3	0	4.4
11	.4	.8	.9				6.5	148	104	2.6	0	*1.7
12	.9	.8	.9				5.5	161	104	2.2	0	.5
13	.6	.8	.8			.8	8.8	161	96	2.0	0	.1
14	.9	.9	.8				5.8	109	80	2.0	0	0
15	1.3	.9	.8				5.2	95	70	2.2	0	0
16	1.0	.8	.8	0.5	0.4	1.0	5.5	96	65	1.6	.1	0
17	.9	.9	.8			1.2	7.7	96	63	*1.2	*.2	0
18	1.0	.8	.9			1.6	15	133	77	.9	.2	.1
19	1.2	.9	1.0			1.6	*23	165	72	.9	.1	.5
20	.9	.8	1.0			1.6	34	165	*69	1.0	.1	1.0
21	.8	.7	1.0			1.6	33	154	62	1.2	.1	1.5
22	.6	.9	1.0			1.8	31	*175	57	1.0	0	2.0
23	.6	.9	.9			3.0	38	171	50	.7	0	4.0
24	.6	.8	.9			3.6	28	159	44	.4	0	.6
25	.5	.9	.9			4.6	22	152	36	.3	.7	.5
26	.4	1.0	.9			5	19	157	31	.2	1.8	4.0
27	.4	1.0	.8			*5.2	24	154	28	.3	.4	3.5
28	.4	.8	.8			3.5	*39	154	16	.3	0	4.0
29	.6	.8	.7			3.5	56	157	13	.3	0	5
30	.4	.9	.7			3.8	72	152	13	.2	0	6
31	.4	-----	.7		-----	3.5	-----	140	-----	.2	0	-----
Total	15.1	24.6	27.3	15.5	11.2	56.1	574.7	3847	2180	83.5	12.3	70.7
Mean	0.48	0.82	0.88	0.5	0.4	1.81	19.2	124	72.7	2.69	0.40	2.36
Ac-ft	30	49	54	31	22	111	1,140	7,630	4,320	166	24	140

Calendar year 1960: Max 223 Min 0 Mean 25.3 Ac-ft 18,350

Water year 1960-61: Max 175 Min 0 Mean 19.0 Ac-ft 13,720

Peak discharge (base, 160 cfs).--May 13 (12:30 a.m.) 216 cfs (4.09 ft); May 21 (9 p.m.) 220 cfs (4.15 ft).

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7-16, 28, 29, Dec. 3-24. No gage-height record Dec. 25 to Mar. 27 (stage-discharge relation affected by ice during most of period). Stage-discharge relation indefinite June 14, 15, Aug. 25 to Sept. 10, Sept. 18-30.

## DIVIDE CREEK BASIN

9-907. East Divide Creek near Silt, Colo.

Location.--Lat 39°26', long 107°34', in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.20, T.7 S., R.91 W., on right bank an eighth of a mile upstream from unnamed tributary, three-quarters of a mile upstream from June Creek, and 9 miles southeast of Silt.

Drainage area.--40.8 sq mi.

Records available.--October 1959 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 80 cfs May 19 (gage height, 4.29 ft); maximum gage height, 5.06 ft Mar. 16 (backwater from ice); no flow for many days.

1959-61: Maximum discharge, 130 cfs May 12, 1960; maximum gage-height, 5.06 ft Mar. 16, 1961 (backwater from ice); no flow for many days in each year.

Remarks.--Records good except those for period of ice effect, which are poor. One small diversion above station for irrigation of hay meadows.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 13-25)

2.8	0	3.2	1.9	3.8	20
2.9	.1	3.3	3.5	4.0	36
3.0	.3	3.4	5.7	4.3	85
3.1	.8	3.6	12		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.4		(*)	0.2	1.8	25	4.6	4.2	0.2	0
2		0	*.4			.2	2.1	32	4.3	2.9	.4	0
3		*0	.4			*.2	2.9	35	3.9	2.4	.6	.8
4		0	.3			.2	5.0	31	3.5	2.4	.8	1.0
5		0	.2			.2	5.3	28	*3.2	2.2	.6	.8
6		0		(*)	0	.3	4.6	22	3.0	1.6	.4	1.0
7	(*)	0				.4	5.3	21	2.7	1.7	.1	.4
8		0				.4	5.0	*2.1	2.5	1.7	0	.2
9		.2				.4	3.9	2.4	2.4	1.5	0	.3
10		.2				.8	3.5	3.2	2.2	1.5	0	1.1
11		.3				1.4	3.5	5.0	2.0	1.5	0	*.4
12		.3				1.6	2.7	5.8	1.9	1.4	0	.2
13		.3				1.6	3.7	5.5	1.7	1.2	0	.1
14		.3				1.8	2.9	3.7	1.6	1.2	0	0
15		.2			0	2.0	2.9	3.4	1.4	1.2	0	0
16		.2				2.0	2.5	3.9	1.4	.9	0	1.3
17		.2				2.0	3.0	4.3	1.3	*1.2	*0	.2
18		.2	1			2.0	5.3	5.7	1.2	1.5	0	0
19		.2				2.0	*9.4	6.5	1.1	1.4	0	.8
20		.2			1	2.0	11	6.4	*1.0	1.4	0	.3
21		.3				2.0	10	6.0	9.0	1.9	0	.3
22		.4				2.2	10	*6.5	8.7	1.7	0	1.4
23		.6				2.2	13	6.7	8.1	.9	0	1.8
24		.6				2.0	12	6.4	6.0	.6	0	.2
25		.7				2.0	9.7	6.0	5.3	.4	0	1.1
26		.7				2.0	6.9	6.0	4.8	.4	0	1.2
27		.6				*1.8	7.8	5.8	4.2	.4	0	.8
28		.4				1.4	11	5.7	4.2	.3	0	.8
29		.2				2.2	17	5.5	3.9	.4	0	1.2
30		.3				2.0	21	5.7	4.4	.6	0	1.8
31		-----				2.0	-----	5.3	-----	.3	0	-----
Total	0	7.6	4.3	0	1.8	43.5	204.7	1,42.9	527.6	42.9	3.1	22.0
Mean	0	0.25	0.14	0	0.06	1.40	6.82	46.1	17.6	1.38	0.10	0.73
Ac-ft	0	15	8.5	0	3.6	86	406	2,830	1,050	85	6.1	44

Calendar year 1960: Max 103 Min 0 Mean 8.78 Ac-ft 6,370  
Water year 1960-61: Max 67 Min 0 Mean 6.26 Ac-ft 4,530

Peak discharge (base, 80 cfs)--May 19 (11 p.m.) 80 cfs (4.29 ft).

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17 to Mar. 31 (no gage-height record Nov. 17 to Mar. 3).

9-915. East Rifle Creek near Rifle, Colo.

Location---Lat 39°41', long 107°41', in sec.22, T.4 S., R.92 W., on right bank 100 ft downstream from abandoned powerplant outlet, 100 ft upstream from Grass Valley Canal, and 12 miles northeast of Rifle.

Drainage area---32 sq mi, approximately.

Records available---October 1936 to September 1943 (published as East Fork Rifle Creek near Rifle), October 1956 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage---Water-stage recorder. Altitude of gage is 6,550 ft (by barometer). Prior to Apr. 20, 1938, staff gage just downstream at different datum. Apr. 20 to Dec. 3, 1938, staff gage at same site and datum. Dec. 4, 1938, to Sept. 30, 1943, water-stage recorder at same site and datum.

Average discharge---12 years, 39.0 cfs (28,230 acre-ft per year).

Extremes---Maximum discharge during year, 63 cfs Feb. 17 (gage height, 2.25 ft), caused by temporary release from fish hatchery; minimum daily, 28 cfs May 3-7, 9.

1936-43, 1956-61: Maximum discharge observed, 409 cfs Aug. 5, 1937 (gage height, 4.00 ft, datum then in use), from rating curve extended above 50 cfs; minimum daily, 24 cfs Feb. 18, 1938, Dec. 27-29, 1939, Feb. 26-28, 1941.

Remarks---Records good except those for periods of indefinite stage-discharge relation or no gage-height record, which are fair. Several small diversions for irrigation above station. One diversion to Colorado Fish and Game Department fish hatchery; water is returned to stream above gage.

Rating table, water year 1960-61, except period of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)

1.8 25  
2.0 40  
2.1 49

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	34	34	34	e 31	32	30	29	37	33	33	31
2	36	*34	34	34	e 31	*32	30	29	36	32	34	31
3	*36	34	34	32	e 31	32	*30	28	36	33	33	31
4	36	34	34	32	e 31	31	30	28	36	31	*32	31
5	35	34	34	31	e 31	31	30	*28	35	32	33	31
6	36	34	33	*32	e 31	31	30	28	35	32	33	31
7	35	35	32	34	e 31	31	30	28	34	33	33	31
8	35	34	33	34	e 31	30	29	29	*34	33	33	31
9	35	34	34	34	e 31	30	30	28	34	33	33	31
10	35	34	34	34	e 31	31	31	29	34	32	31	31
11	37	34	34	34	e 32	31	31	29	34	32	31	31
12	36	34	34	34	e 32	31	31	30	32	32	31	31
13	35	34	34	34	33	31	31	34	32	*33	31	31
14	35	34	34	34	33	31	31	33	31	32	31	31
15	34	34	35	34	33	31	31	33	31	32	31	31
16	34	34	34	34	32	31	31	35	31	32	31	31
17	34	34	34	34	33	31	31	37	31	32	30	31
18	34	34	35	34	32	31	31	38	32	33	31	33
19	34	34	36	34	31	31	31	40	31	33	30	32
20	34	34	36	34	31	31	*32	44	31	34	30	*32
21	34	34	36	34	31	30	31	42	31	34	31	34
22	34	34	36	34	31	31	31	42	32	33	30	38
23	34	34	35	34	31	30	31	41	*33	33	31	35
24	34	34	35	34	31	31	31	40	33	33	*31	34
25	34	34	35	34	31	31	31	*39	32	34	31	32
26	34	34	35	34	31	31	31	38	32	33	31	32
27	34	34	35	34	31	31	31	38	32	33	31	32
28	34	34	35	34	32	31	30	39	32	32	30	32
29	34	32	34	33	-	31	30	38	33	33	30	33
30	34	*34	34	*33	-----	31	30	38	33	33	30	33
31	34	-----	34	31	-----	31	-----	38	-----	33	32	-----
Total	1,076	1,019	1,066	1,040	881	960	918	1,070	990	1,013	973	959
Mean	34.7	34.0	34.4	33.5	31.5	31.0	30.6	34.5	33.0	32.7	31.4	32.0
Ac-ft	2,130	2,020	2,110	2,060	1,750	1,900	1,820	2,120	1,960	2,010	1,930	1,900

Calendar year 1960: Max 67 Min 29 Mean 36.0 Ac-ft 26,100  
Water year 1960-61: Max 44 Min 28 Mean 32.8 Ac-ft 23,710

\* Discharge measurement made on this day.

e Stage-discharge relation indefinite.

Note---No gage-height record Mar. 31 to Apr. 3, Apr. 11-20.

## RIFLE CREEK BASIN

9-920. Rifle Creek near Rifle, Colo.

Location.--Lat 39°37'10", long 107°45'45", in NE¼NW¼ sec.18, T.5 S., R.92 W., on right bank 0.5 mile downstream from East Rifle Creek and 6.2 miles northeast of Rifle.

Drainage area.--140 sq mi.

Records available.--October 1939 to September 1946, October 1952 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Concrete control since Apr. 20, 1960. Altitude of gage is 5,810 ft (from topographic map). Prior to July 21, 1942, staff gage at same site at datum 1.31 ft higher. July 21, 1942, to Sept. 30, 1946, water-stage recorder at site 100 ft downstream at same datum.

Average discharge.--16 years, 25.0 cfs, unadjusted (18,100 acre-ft per year).

Extremes.--Maximum discharge during year, 176 cfs Sept. 22 (gage height, 2.91 ft); minimum daily, 3.4 cfs Jan. 18.

1939-46, 1952-61: Maximum discharge, 758 cfs July 18, 1953 (gage height, 6.14 ft, from floodmarks), from rating curve extended above 110 cfs on basis of slope-area measurement of peak flow; minimum daily, 2.7 cfs Feb. 6, 1941.

Maximum stage known, 7.7 ft July 27, 1951, from floodmarks at site 100 ft downstream (discharge, about 1,500 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 870 acres above station in Rifle Creek basin. Some regulation by small reservoir on West Rifle Creek. Diversion above station from East Rifle Creek by Grass Valley Canal to Harvey Gap Reservoir for use outside Rifle Creek basin (see table below). A small amount of water diverted from canal for irrigation in Elk Creek drainage.

## Monthly diversion, in acre-feet, water year October 1960 to September 1961

Month	Diversion
October.....	1,260
November.....	1,990
December.....	2,020
Calendar year 1960.....	12,390
January.....	1,930
February.....	1,340
March.....	1,810
April.....	1,330
May.....	186
June.....	24
July.....	19
August.....	83
September.....	535
Water year 1960-61.....	12,530

## Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	13	8	7.5	6.5	7	7.0	30	36	34	28	32
2	24	*13	8	7.5	5	*7.0	7.0	31	36	32	29	33
3	*26	11	8	7	6.5	7.0	*7.3	31	37	32	29	33
4	28	8.5	7.5	7	7	7.0	7.6	31	37	32	*27	33
5	28	7.9	7	7	6.5	7.0	7.6	*32	36	32	26	33
6	26	8.2	7	*7	6	7.3	7.3	31	36	33	26	31
7	26	8.5	7.5	7	6	7	8.5	32	36	32	26	31
8	25	9.1	8	7	6.5	7.5	8.2	32	*36	31	29	31
9	25	8.2	8.5	7.5	7	8	7.6	31	34	32	29	36
10	25	8	8.5	7.5	6.5	8	8.8	31	34	32	29	31
11	32	8	8	7	6.5	8.5	7.9	31	34	32	28	30
12	26	7.9	8	6.7	7	8.2	7.6	31	34	32	28	29
13	22	7.9	8	6.1	6.5	9.4	7.9	34	32	*32	30	29
14	19	7.9	8	5.5	7	12	7.6	34	33	33	28	30
15	18	7.9	8	5.2	*7.5	13	7.6	34	34	34	28	30
16	18	8	7.5	5.5	8	14	7.6	34	33	34	28	30
17	18	8	7.5	4.4	8.5	9.4	7.3	37	34	33	28	31
18	18	8	8	3.4	7	8.8	7.3	31	33	32	29	36
19	18	7.9	7.5	4.8	35	7.9	7.6	9.1	31	32	28	36
20	18	8	7.3	5.5	40	7.9	*7.9	21	31	31	28	*26
21	18	8	6.7	6	32	7.9	10	51	31	32	31	30
22	18	8	7.0	6.5	31	7.9	24	47	31	31	31	39
23	16	7.5	6.7	7	32	7.9	23	45	*31	31	31	36
24	13	8	7.0	7	28	8.5	23	44	31	31	*31	17
25	13	8.5	7	7	16	9.1	25	*43	31	31	34	8.5
26	13	8	7.5	7	8.5	8.5	30	39	31	31	35	10
27	13	7.6	7	7	7.5	8.5	32	38	32	30	32	18
28	13	8	6.5	6	7	7.9	31	38	33	28	31	15
29	14	7.5	6.5	5.5	-	7.6	31	38	33	28	31	13
30	14	*8	7	*6	-	7.3	31	37	32	29	31	12
31	13	-----	8	6	-----	7.0	-----	36	-----	29	32	-----
Total	622	254.0	232.7	197.1	359.5	260.0	413.2	1064.1	1003	978	911	829.5
Mean	20.1	8.47	7.51	6.36	12.8	8.39	13.8	34.3	33.4	31.5	29.4	27.6
Ac-ft	1,230	504	462	391	713	516	820	2,110	1,990	1,940	1,810	1,650

Calendar year 1960: Max 60

Min 6

Mean 23.9

Ac-ft 17,330

Water year 1960-61: Max 51

Min 3.4

Mean 19.5

Ac-ft 14,140

Peak discharge (base, 140 cfs).--Sept. 22 (2:30 a.m.) 176 cfs (2.91 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7, 10, 11, 16-18, 20-26, Nov. 28 to Dec. 19, Dec. 25 to Jan. 11, Jan. 17 to Feb. 20, Feb. 27 to Mar. 1, Mar. 6-10 (no gage-height record Jan. 25 to Feb. 15).



9-925. Beaver Creek near Rifle, Colo.

Location.--Lat 39°28'20" (revised), long 107°49'55", in NE $\frac{1}{4}$  sec.1, T.7 S., R.94 W., on left bank 150 ft upstream from road bridge,  $\frac{1}{4}$  miles upstream from mouth, and 4.8 miles southwest of Rifle.

Drainage area.--16 sq mi, approximately.

Records available.--October 1952 to September 1961.

Gage.--Water-stage recorder and plank control. Altitude of gage is 6,685 ft (from topographic map).

Average discharge.--9 years, 3.88 cfs (2,810 acre-ft per year).

Extremes.--Maximum discharge during year, 32 cfs May 22 (gage height, 3.45 ft); minimum daily, 0.6 cfs Jan. 1-3, Mar. 12.  
1952-61: Maximum discharge, 72 cfs June 5, 1957, from rating curve extended above 40 cfs; maximum gage height, 3.70 ft May 29, 1958; minimum daily discharge, 0.3 cfs Jan. 4-6, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 170 acres below station and about 380 acres in Mamm Creek basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	0.2	3.1	9.4
2.8	1.2	3.3	20
2.9	3.6	3.4	27
3.0	6.4		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	1.4	*1.1	0.6	1.2	0.9	0.9	4.5	1.9	5.3	2.8	1.4
2	1.1	1.4	1.1	.6	1.1	*1.1	.8	5.0	1.9	5.0	2.6	1.6
3	*1.1	*1.2	1.1	.6	1.1	1.1	*1.2	5.9	1.7	4.8	2.8	2.6
4	.8	1.4	1.1	.8	1.2	1.1	1.8	*5.9	1.5	4.5	*2.6	2.3
5	.8	1.1	1.1	.8	1.1	1.1	1.8	5.9	*1.4	4.5	2.1	2.8
6	.8	1.1	1.1	*.9	1.1	.9	1.6	5.3	1.4	4.5	1.8	*2.8
7	.8	1.8	1.1	1.2	1.1	.8	1.1	4.8	1.4	4.2	1.6	2.8
8	.8	1.2	.9	1.4	1.2	.8	1.1	4.2	1.4	4.2	1.6	3.3
9	.9	1.2	.9	1.2	1.4	.7	.9	4.2	1.4	3.6	1.6	4.5
10	1.6	1.1	.9	1.1	1.4	.7	.8	5.6	1.4	3.6	1.6	3.6
11	2.6	1.1	.9	.9	1.6	.7	.7	7.9	1.4	3.6	1.6	3.1
12	1.6	1.2	.9	.8	1.6	.6	.8	9.9	1.4	3.3	2.1	2.6
13	1.4	1.1	.9	.9	1.4	.7	.8	9.9	1.4	*3.3	1.6	2.1
14	1.6	1.1	.8	1.1	1.4	.8	.8	7.0	1.2	3.3	1.4	2.1
15	1.4	1.0	.8	1.2	1.4	1.1	.7	7.0	1.1	2.8	1.6	2.1
16	1.4	1.0	.8	1.1	1.4	1.2	.9	7.9	1.0	2.6	1.8	2.1
17	1.6	1.0	.8	1.1	1.4	1.1	.8	8.2	9.4	2.3	2.3	2.1
18	1.6	1.0	.8	1.1	1.4	.9	1.6	8.8	8.8	2.3	1.8	3.1
19	1.4	1.1	.8	.9	1.2	.8	2.1	1.3	8.2	2.3	1.6	3.3
20	1.4	1.0	.8	.8	1.2	.9	*2.1	1.8	*7.6	2.3	1.6	*3.1
21	1.2	.9	.8	.9	1.2	.8	1.8	1.8	7.0	2.3	1.6	3.1
22	1.2	.9	.8	1.1	1.2	.9	2.1	*2.4	7.0	2.3	1.4	4.5
23	1.2	.9	.8	1.1	1.2	1.1	2.3	2.1	7.0	2.1	1.2	4.2
24	1.2	.9	.7	1.8	1.1	1.2	1.6	1.8	7.3	2.1	*1.4	3.6
25	1.2	.9	.7	1.6	1.1	1.2	1.4	1.9	6.7	2.3	2.8	3.1
26	1.2	1.0	.7	1.6	1.1	1.1	1.2	2.3	6.1	2.3	2.3	2.8
27	1.4	1.1	.7	1.4	1.1	.9	1.2	2.1	5.9	1.8	1.6	2.8
28	1.4	1.0	.7	1.2	.9	.8	2.1	1.8	5.6	1.8	1.4	3.5
29	1.2	1.0	.7	1.2	-	.9	2.6	1.9	5.6	2.6	1.4	5.0
30	.8	1.0	.7	*1.1	-----	1.1	3.6	1.9	5.6	2.6	1.4	4.5
31	1.1	-----	.7	1.2	-----	.8	-----	1.9	-----	2.6	1.4	-----
Total	38.9	33.1	26.7	33.3	34.8	28.8	43.2	367.9	326.8	97.1	56.4	90.5
Mean	1.25	1.10	0.86	1.07	1.24	0.93	1.44	11.9	10.9	3.13	1.82	3.02
Ac-ft	77	66	53	66	69	57	86	730	648	193	112	180

Calendar year 1960: Max 23 Min 0.4 Mean 3.55 Ac-ft 2,580

Water year 1960-61: Max 24 Min 0.6 Mean 3.23 Ac-ft 2,340

Peak discharge (base, 25 cfs)--May 22 (7:30 p.m.) 32 cfs (3.45 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10, 11, 15-18, 20-22, 24-26, Nov. 28 to Dec. 3. No gage-height record Sept. 26-30.

## BATTLEMENT CREEK BASIN

9-926. Battlement Creek near Grand Valley, Colo.

Location.--Lat 39°26', long 107°59', in SE $\frac{1}{4}$  sec.15, T.7 S., R.95 W., on left bank 300 ft downstream from ford,  $4\frac{1}{2}$  miles upstream from mouth, and 5 miles southeast of Grand Valley.

Drainage area.--8.31 sq mi.

Records available.--October 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,630 ft (from topographic map).

Average discharge.--5 years, 8.40 cfs (6,080 acre-ft per year).

Extremes.--Maximum discharge during year, 46 cfs May 25 (gage height, 2.27 ft); minimum not determined.  
1956-61: Maximum discharge, 102 cfs June 7, 1957 (gage height, 2.79 ft); maximum gage height, 2.96 ft May 26, 1958 (backwater from debris); minimum discharge not determined.

Remarks.--Records fair except those for periods of ice effect, which are poor. Slight regulation from Battlement Reservoir. No diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Aug. 28

Aug. 29 to Sept. 30

1.1	1.3	1.5	1.0
1.2	1.9	1.7	2.8
1.4	4.0	1.9	5.0
1.8	13	2.1	9.5
2.0	22		
2.2	36		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	3.0	*2.2				1.7	7.1	32	10	3.0	2.1
2	6.4	2.9	2.2				1.9	8.4	31	9.8	3.9	2.4
3	*2.5	*3.0	2.2				*2.4	9.4	30	9.6	3.9	2.8
4	2.1	2.9	2.1				2.8	8.9	28	9.4	*3.5	2.8
5	1.8	2.9	2.0				2.5	*8.0	*28	8.9	3.0	2.9
6	1.8	2.9	2.0	(*)		1	2.4	6.9	27	8.4	2.7	1.6
7	1.8	2.8	2.1				2.3	6.4	28	8.2	2.3	1.4
8	2.7	2.8	2.1				1.9	6.4	27	8.0	3.3	1.4
9	5.6	2.7	2.0				1.8	7.3	26	7.8	2.7	4.8
10	4.6	2.7	1.9				1.8	10	27	6.9	2.6	4.3
11	6.0	2.8	1.8				1.8	14	26	6.2	2.6	3.6
12	4.4	2.9	1.8				1.8	18	25	6.0	2.7	3.4
13	3.4	3.0	1.8				1.8	16	24	6.0	2.7	3.4
14	3.3	3.0	1.9				1.6	12	23	*5.8	2.4	3.2
15	3.3	2.8	2.1				1.7	12	22	5.4	2.5	3.2
16	3.4	2.7	2.4	0.8	(*)	1	1.8	12	21	4.8	3.0	4.4
17	3.4	2.6	2.5				1.9	12	20	4.8	2.9	4.6
18	3.5	2.5	1.8				2.5	14	19	4.6	2.6	8.2
19	3.4	2.5	1.4				3.3	18	18	4.4	2.5	6.8
20	3.4	2.5	1.4				3.5	20	*16	4.8	2.5	6.0
21	3.4	2.5	1.4				*2.9	20	15	4.4	2.5	*6.0
22	3.4	2.5	1.5				3.4	*23	14	4.0	2.5	6.8
23	3.4	2.4	1.6				3.9	25	13	3.3	2.4	7.0
24	3.4	2.4	1.8				2.9	24	12	3.0	*2.5	6.8
25	3.4	2.3	1.6				2.7	34	12	3.0	2.9	6.0
26	3.3	2.3	1.6				2.6	32	11	3.2	2.5	5.8
27	3.0	2.3	1.5				2.7	31	11	3.0	2.2	5.8
28	2.8	2.3	1.4				1.7	35	32	11	2.6	6.0
29	2.7	2.3	1.2				1.8	4.8	32	10	*2.0	7.8
30	2.5	2.3	1.0	(*)			1.8	6.2	33	10	2.5	6.4
31	3.0		1.2				1.7		33		2.1	
Total	104.1	79.5	55.5	24.8	28	43.6	78.8	545.8	617	174.3	83.0	137.7
Mean	3.36	2.65	1.79	0.8	1	1.41	2.63	17.6	20.6	5.62	2.68	4.59
Ac-ft	206	158	110	49	56	86	156	1,080	1,220	346	165	275

Calendar year 1960: Max 40

Min -

Mean 6.52

Ac-ft 4,730

Water year 1960-61: Max 34

Min -

Mean 5.40

Ac-ft 3,900

Peak discharge (base, 40 cfs).--May 25 (2 p.m.) 46 cfs (2.27 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31, Nov. 7-12, 16-25, 28, 29, Dec. 2, 5, 6, Dec. 18 to Mar. 27 (no gage-height record Jan. 5 to Mar. 27).

9-928. West Fork Parachute Creek near Grand Valley, Colo.

Location.--Lat 39°35'15", long 108°07'30", in SW¼NW¼ sec.25, T.5 S., R.96 W., on left bank 0.3 mile upstream from bridge, a quarter of a mile downstream from Red Gulch, 1.1 miles upstream from Parachute Creek, and 10 miles north of Grand Valley.

Drainage area.--48.1 sq mi.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Metal control since May 27, 1959. Altitude of gage is 5,900 ft (from topographic map).

Extremes.--Maximum discharge during year not determined, occurred Aug. 3; no flow for many days.

1957-61: Maximum discharge, about 120 cfs Apr. 12, 1960; maximum gage height, 4.46 ft Apr. 15, 1960; no flow at times in 1957, 1960-61.

Remarks.--Records poor. No diversion above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.8	(*)				1.9	6	0.9	0.2	0.7	0.4
2	.4	.8					4.0	6.5	.8	.2	1.5	.4
3	*.4	*.9	0.2				*9.0	8	.8	.2	5	.4
4	.4	.8					10	7	.8	.2	*.8	.4
5	.4	.6					9	*6.5	.7	.2	.4	.4
6	.4	.5				0	8	4.5	.2	.2	.4	.4
7	.4	.6					6	6.4	.4	.2	.4	*.4
8	.4	.5					5	6.0	*.5	.1	.4	.4
9	.8	.4					6	5.0	.2	.1	.4	8.5
10	.9	.4	.1				5	*5.0	.1	0	.4	5.4
11	1.6	.4		(*)			4.5	3.8	.2	0	.4	3.8
12	1.0	.4					5	3.5	.1	0	.5	2.8
13	.8	.4				.6	6	5.0	.1	0	.6	2.0
14	1.0	.4					5	5.0	.2	*0	.6	1.4
15	1.0	.4		0	(*)		4.5	3.5	.2	.1	.5	.8
16	1.0	.3					5	3.5	.2	0	.8	.8
17	.8	.3					5.5	3.5	.2	0	.6	.8
18	.8	.3					6	2.5	.2	0	.5	1.6
19	.8	.3					6.5	2.5	.1	0	.4	1.6
20	.8	.3					7	2.5	.1	0	.4	1.0
21	.8	.3	0				*7.5	2.4	.1	.1	.4	*2.0
22	.8	.3					7	*2.8	.1	0	.4	1.1
23	.7	.3				1.2	6	2.2	.1	0	.6	8.5
24	.8	.3					5	2.4	.1	0	*.9	7.8
25	.8	.3					4.5	2.4	.2	0	1.0	6.8
26	.8	.3					4.5	2.5	*.2	0	.8	6.4
27	.8	.3				(*)	*5	1.8	.2	.1	.7	2.5
28	.8	.2				(*)	5.5	1.6	.2	.2	.6	2.0
29	.5	.2					5.5	1.3	.2	.3	.5	2.0
30	.4	.2		(*)			5.5	1.4	.2	.4	.6	.7
31	.6							.9		.5	.5	
Total	22.3	12.5	1.8	0	0	21.6	174.9	117.9	8.6	3.3	22.7	83.4
Mean	0.72	0.42	0.1	0	0	0.7	5.83	3.80	0.29	0.11	0.73	2.78
Ac-ft	44	25	3.6	0	0	43	347	234	17	6.5	45	165

Calendar year 1960: Max 95 Min 0 Mean 2.72 Ac-ft 1,970  
 Water year 1960-61: Max 11 Min 0 Mean 1.28 Ac-ft 930

Peak discharge (base, 50 cfs).--Aug. 3 (time and discharge unknown).

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Nov. 9 to Dec. 13, Mar. 12-31 (stage-discharge relation affected by ice), Apr. 4 to May 5, June 20 to July 9, July 15, 21, July 27 to Aug. 4, Aug. 10 to Sept. 8.

## COLORADO RIVER MAIN STEM

9-955. Colorado River near Cameo, Colo.

Location--Lat 39°14'20", long 108°16'00", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec.30, T.9 S., R.97 W., on left bank 100 ft north of U. S. Highways 6 and 24, half a mile upstream from Jackson Canyon, 5.9 miles upstream from Grand Valley project diversion dam, and 7 miles northeast of Cameo.

Drainage area--8,050 sq mi, approximately.

Records available--October 1933 to September 1961.

Gage--Water-stage recorder. Datum of gage is 4,813.73 ft above mean sea level, datum of 1929. Prior to Oct. 10, 1934, staff gage on river and water-stage recorder on highline canal, about 10 miles downstream at different datum. Oct. 10, 1934, to Feb. 27, 1958, at site 3 miles downstream at datum 22.55 ft lower.

Average discharge--28 years, 3,921 cfs (2,839,000 acre-ft per year).

Extremes--Maximum discharge during year, 13,100 cfs June 1 (gage height, 7.83 ft); maximum gage height, 8.35 ft Jan. 7 (backwater from ice); minimum daily discharge, 1,200 cfs Jan. 5.  
1933-61: Maximum discharge, 36,000 cfs June 16, 1935; maximum gage height, 11.60 ft June 8, 1952 (site and datum then in use); minimum daily discharge, 700 cfs Dec. 29, 1959.

Remarks--Records good except those for period of ice effect, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, and diversion for irrigation of about 160,000 acres.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.9	1,130	5.0	4,400
3.0	1,230	6.0	6,740
3.5	1,800	8.0	13,600
4.0	2,540		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.750	1.630	*1.460	1.430	1.700	1.350	1.410	2.070	1.2400	3.420	2.000	1.810
2	1.700	1.660	1.570	1.560	1.700	1.410	1.410	2.440	1.1900	3.190	2.280	1.920
3	1.680	*1.730	1.630	1.400	1.700	1.420	1.480	2.920	1.0400	3.010	2.280	2.070
4	1.660	1.730	1.810	1.300	1.800	1.410	1.410	*3.330	3.800	2.860	2.330	2.320
5	1.660	1.700	1.800	1.200	1.700	1.370	1.640	3.520	7.560	2.730	2.120	2.490
6	1.680	1.680	1.680	1.400	1.600	1.410	1.800	3.280	7.390	2.640	1.970	2.540
7	*1.630	1.750	1.570	1.500	1.500	1.340	1.920	2.800	*7.560	2.660	*1.810	2.680
8	1.680	1.810	1.420	1.600	1.600	1.260	1.920	2.480	7.890	2.570	1.730	2.810
9	1.700	1.750	1.550	1.700	1.660	1.220	1.760	2.250	9.120	2.520	1.690	3.080
10	1.780	1.730	1.660	1.700	1.660	1.210	1.640	2.320	1.0200	2.400	1.810	3.260
11	1.740	1.660	1.760	1.700	1.520	1.300	1.580	2.740	1.0100	2.270	1.790	3.370
12	1.680	1.640	1.680	1.750	1.490	1.350	1.560	4.200	9.120	2.180	1.760	2.880
13	1.750	1.660	1.600	1.650	*1.530	1.240	1.620	5.350	8.800	2.080	1.740	2.590
14	1.830	1.630	1.560	1.600	1.450	1.350	1.670	5.240	8.160	*1.970	1.740	2.410
15	1.810	1.680	1.500	1.700	1.500	1.280	1.730	4.400	7.420	1.920	1.700	2.250
16	1.860	1.640	1.460	1.700	1.500	1.420	1.700	3.800	7.000	1.930	1.750	2.140
17	1.800	1.670	1.410	1.700	1.520	1.480	1.600	3.840	6.790	2.000	1.810	2.190
18	1.700	1.660	1.530	1.700	1.580	1.520	1.490	3.980	6.530	1.970	1.800	2.380
19	1.760	1.670	1.830	1.650	1.450	1.480	1.480	4.730	6.220	1.940	1.860	2.410
20	1.790	1.810	1.840	1.600	1.430	1.440	1.730	5.930	6.050	1.900	1.860	2.620
21	1.840	1.740	1.690	1.600	1.490	1.440	*2.070	6.510	5.910	1.930	1.840	2.730
22	1.790	1.610	1.690	1.600	1.490	1.430	2.180	*7.280	5.640	1.970	1.830	3.400
23	1.760	1.600	1.790	1.650	1.440	1.440	2.030	8.480	5.170	2.160	1.800	4.420
24	1.730	1.670	1.760	1.700	*1.460	1.440	2.040	9.290	4.770	2.200	1.800	4.400
25	1.700	1.630	1.690	1.700	1.330	1.450	2.040	9.460	4.620	2.070	1.860	3.900
26	1.700	1.660	1.620	1.700	1.460	1.520	1.960	9.430	4.300	1.970	1.860	*3.460
27	1.690	1.580	1.620	1.700	1.380	1.610	1.840	1.0200	*4.020	1.880	1.880	3.690
28	1.690	1.630	1.760	1.600	1.270	1.410	1.700	1.1300	3.780	1.810	1.900	3.740
29	1.680	1.560	1.620	1.600	-	1.420	1.700	*1.1100	3.650	1.840	1.880	3.880
30	1.800	1.340	1.460	1.700	-----	1.400	1.800	1.1800	3.420	1.900	*1.840	4.320
31	1.660	-----	1.420	1.700	-----	*1.360	-----	1.2300	-----	1.930	1.790	-----
Total	53,680	49,910	50,440	49,790	42,910	43,180	51,910	178,770	214,690	69,820	58,110	88,160
Mean	1,732	1,664	1,627	1,606	1,532	1,393	1,730	5,767	7,156	2,252	1,875	2,939
Ac-ft	106,500	99,000	100,000	98,760	85,110	85,650	103,000	354,600	425,800	138,500	115,300	174,900

Calendar year 1960: Max 15,700 Min 1,300 Mean 3,324 Ac-ft 2,413,000

Water year 1960-61: Max 12,400 Min 1,200 Mean 2,606 Ac-ft 1,887,000

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 3 to Feb. 8.



9-958. Plateau Creek near Heiberger, Colo.

Location.--Lat 39°13'10", long 107°46'30", near center of sec.4, T.10 S., R.93 W., on right bank 50 ft upstream from ford, 7 miles south of Heiberger, and 9½ miles southeast of Collbran.

Drainage area.--19 sq mi, approximately.

Records available.--May 1958 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 8,016.31 ft above mean sea level (Bureau of Reclamation bench mark).

Extremes.--Maximum discharge during year, 143 cfs May 22 (gage height, 3.01 ft); minimum daily, 0.6 cfs Dec. 6.  
1958-61: Maximum discharge, 272 cfs May 23, 1958 (gage height, 3.56 ft); minimum daily, 0.3 cfs Sept. 11, 1959.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversions for irrigation of hay meadows and slight regulation by one reservoir (capacity, 200 acre-ft) above station. Erie Canal diverts water above station to Buzzard Creek drainage for irrigation of about 280 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 4 to Aug. 6, Aug. 15 to Sept. 13)

1.5	0.3	1.8	3.6	2.5	50
1.6	.9	1.9	6.0	2.8	95
1.7	1.9	2.1	17	2.9	115

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	1.6	*1.6	1.2	2.0	1.8	2.8	32	47	4.8	3.4	1.6
2	.8	1.8	1.4	1.0	*2.4	1.8	2.9	41	36	4.1	3.6	1.5
3	.9	2.0	1.4	.9	2.4	1.5	4.1	46	23	3.8	3.8	2.1
4	.9	2.0	1.2	.9	2.2	1.4	6.5	43	10	2.9	3.3	2.8
5	1.0	1.8	.9	1.0	2.0	1.4	7.0	30	7.5	2.9	3.4	3.4
6	.9	1.8	.6	1.2	1.6	1.4	6.5	21	9.0	*3.8	2.1	4.8
7	.8	*2.0	1.0	1.4	1.6	1.2	5.3	13	10	4.6	1.8	4.6
8	.9	1.8	1.2	1.4	1.6	1.2	5.5	16	13	3.1	1.7	4.3
9	1.0	1.4	1.2	*1.6	2.0	1.4	6.5	*18	15	2.4	*1.5	6.0
10	*1.4	1.6	1.2	1.6	2.2	1.6	3.6	32	19	2.2	1.2	4.1
11	1.6	1.9	1.2	1.4	2.4	1.6	3.6	54	20	2.2	1.4	1.9
12	1.8	1.7	1.2	1.2	2.6	1.6	4.3	60	13	2.4	2.2	1.4
13	1.6	1.7	1.2	1.2	2.4	1.6	3.4	50	9.5	2.2	1.5	1.0
14	1.4	1.7	1.2	1.2	2.4	2.0	3.3	34	5.8	2.1	1.1	1.0
15	1.2	1.7	1.2	1.2	2.6	2.4	5.3	29	*3.8	2.2	1.1	1.5
16	1.2	1.4	1.2	1.4	2.4	3.0	4.3	32	2.8	1.9	2.2	3.3
17	1.2	1.2	1.0	1.4	2.2	3.4	3.8	40	2.9	1.7	1.6	1.7
18	1.2	1.2	1.2	1.4	2.0	3.0	6.5	*57	2.8	1.8	1.5	2.8
19	1.2	1.4	1.2	1.2	1.6	2.8	14	75	1.9	1.7	.8	7.5
20	1.4	1.2	1.2	1.2	2.0	2.8	16	59	1.8	2.1	.7	4.6
21	1.6	1.0	1.2	1.2	2.0	2.6	13	59	1.8	*2.2	1.3	3.4
22	1.6	1.0	1.4	1.2	2.0	2.4	14	81	1.6	1.9	1.0	10
23	1.6	1.2	1.4	1.4	*2.0	2.6	14	99	1.2	1.3	.7	15
24	1.6	1.4	1.4	1.6	2.1	2.8	*10	77	.8	1.2	.7	13
25	1.6	1.4	1.4	1.8	2.2	2.8	12	68	.8	1.4	1.7	10
26	1.8	1.4	1.2	1.8	1.9	2.6	10	72	*.7	1.7	2.1	*12
27	2.0	1.2	1.2	1.6	1.9	2.6	10	72	1.7	1.6	1.0	12
28	1.6	1.0	1.0	1.6	1.8	2.6	13	68	4.8	1.5	.8	13
29	1.4	1.0	1.0	1.4	-	*2.6	17	*64	4.8	2.2	.7	16
30	1.1	1.4	1.2	1.6	-----	2.6	23	66	4.8	2.2	*.7	13
31	1.4	-----	1.2	2.0	-----	2.9	-----	57	-----	2.6	1.7	-----
Total	40.5	44.9	37.1	42.2	58.5	68.0	251.2	1570	276.8	74.7	52.3	179.3
Mean	1.31	1.50	1.20	1.36	2.09	2.19	8.37	50.6	9.23	2.41	1.69	5.98
Ac-ft	80	89	74	84	116	135	498	3,110	549	148	104	356

Calendar year 1960: Max 151 Min 0.5 Mean 9.23 Ac-ft 6,690

Water year 1960-61: Max 99 Min 0.6 Mean 7.38 Ac-ft 5,340

Peak discharge (base, 140 cfs).--May 22 (7 p.m.) 143 cfs (3.01 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 10 to Nov. 7, Nov. 16 to Feb. 23, Mar. 4-29 (stage-discharge relation affected by ice during part of period).

## PLATEAU CREEK BASIN

9-961. Vega Reservoir near Collbran, Colo.

Location.--Lat 39°13'30", long 107°48'40", in sec.6, T.10 S., R.93 W., at dam on Plateau Creek, 10 miles southeast of Collbran.

Records available.--April 1960 to September 1961.

Gage.--Staff gage read occasionally. Datum of gage is 7,906 ft above mean sea level (Bureau of Reclamation bench mark); gage readings have been reduced to elevations above mean sea level.

Extremes.--Maximum contents observed during year, 26,800 acre-ft June 18-20 (elevation, 7,976.7 ft); minimum observed, 4,620 acre-ft Oct. 31 (elevation, 7,933.3 ft).  
1960-61: Maximum contents observed, that of June 30, 1961; minimum observed, 1,260 acre-ft Apr. 15, 1960 (elevation, 7,917.4 ft).

Remarks.--Reservoir is formed by an earth- and rock-fill dam. Dam completed by Bureau of Reclamation in 1960. Usable storage began in May 1958 while dam was under construction. Capacity of reservoir, 33,000 acre-ft between elevations 7,906 (bottom of outlet gates) and 7,984 ft (crest of spillway). Dead storage, 820 acre-ft. Figures given herein are usable contents. Reservoir is used to store water for irrigation and power development.

Cooperation.--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	7,933.7	4,720	-
Oct. 31.....	7,933.3	4,620	-100
Nov. 30.....	7,933.7	4,730	+110
Dec. 31.....	7,934.0	4,820	+90
Calendar year 1960.....	-	-	-
Jan. 31.....	7,934.4	4,940	+120
Feb. 28.....	7,935.7	5,340	+400
Mar. 31.....	7,938.0	6,050	+710
Apr. 30.....	7,944.4	8,260	+2,210
May 31.....	7,974.3	24,940	+16,680
June 30.....	7,975.6	25,940	+1,000
July 31.....	7,966.5	19,440	-6,500
Aug. 31.....	7,955.8	13,240	-6,200
Sept. 30.....	7,952.5	11,640	-1,600
Water year 1960-61.....	-	-	+6,920

† Elevation at 8 a.m.

9-965. Plateau Creek near Collbran, Colo.

Location--Lat 39°15'00", long 107°50'25", in NE $\frac{1}{4}$  sec.26, T.9 S., R.94 W., on right bank 10 ft downstream from private bridge,  $\frac{1}{2}$  miles downstream from Leon Creek, and 6 miles east of Collbran.

Drainage area--88 sq mi, approximately.

Records available--September 1921 to September 1961. Prior to October 1933 monthly discharge only, published in WSP 1313.

Gage--Water-stage recorder. Altitude of gage is 7,130 ft (from topographic map).

Average discharge--40 years, 90.6 cfs (65,590 acre-ft per year).

Extremes--Maximum discharge during year, 740 cfs May 27 (gage height, 4.15 ft); minimum daily, 1.9 cfs Feb. 26 (result of storage in Vega Reservoir).

1921-61: Maximum discharge, 3,080 cfs May 27, 1922 (gage height, 6.90 ft), from rating curve extended above 1,300 cfs; minimum daily, that of Feb. 26, 1961; minimum daily prior to construction of Vega Reservoir, 3 cfs Sept. 21, 1926.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Vega Reservoir since 1959. Diversions above station for irrigation of about 800 acres above and about 550 acres below station or in Buzzard Creek drainage. Also diversion above station to Surface Creek in Gunnison River basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Jan. 28 to Feb. 10)

0.4	1.0	1.5	42
.5	2.0	2.0	85
.7	5.0	2.5	145
.9	9.5	3.0	250
1.2	22	3.7	470

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.2	8	*10	9	5.6	2.4	2.4	5.2	267	29	29	22
2	9.5	9	11	10	*5.8	2.6	2.4	5.2	250	23	29	20
3	9.8	10	12	10	5.2	2.4	3.2	7.0	200	22	29	26
4	9.8	*12	11	9	4.8	2.4	3.4	29	140	21	27	23
5	9.0	10	10	8	4.8	2.3	2.8	46	44	22	23	24
6	8.8	9.0	9	9	4.6	2.2	*2.3	51	36	*25	20	27
7	8.8	13	9	9	4.6	2.2	3.0	8.0	43	28	21	26
8	8.8	13	9	9	4.7	2.2	5.0	7.8	33	27	19	20
9	9.0	13	9	*9	4.7	2.2	4.4	*12	33	24	*18	29
10	*13	13	8	9	4.7	2.8	4.4	18	52	23	19	36
11	27	13	8	9	4.6	3.0	4.2	23	55	24	19	22
12	18	12	8	10	4.6	2.9	4.2	37	45	23	20	17
13	16	11	8	10	4.6	3.0	4.4	35	38	23	19	14
14	16	11	6	10	4.7	3.0	4.4	19	36	22	18	13
15	14	11	8	10	4.8	6.0	5.8	19	*36	22	18	13
16	13	11	9	9	4.7	4.1	5.2	20	35	22	20	18
17	14	12	10	9	4.7	3.2	4.7	26	33	20	18	21
18	14	12	10	10	4.8	3.5	5.4	*49	32	20	16	23
19	13	13	10	10	4.6	3.4	6.0	103	38	18	16	58
20	12	12	10	10	4.6	3.5	6.6	113	44	18	16	48
21	12	12	10	9	4.2	3.2	6.0	135	38	*18	17	36
22	11	12	10	8	3.4	3.0	6.0	*263	35	16	15	70
23	12	12	10	9	3.0	3.4	5.6	331	31	16	14	70
24	11	12	9	9	*2.9	4.2	*5.2	295	29	14	14	75
25	9.5	12	9	8	2.0	3.6	5.4	294	26	15	22	55
26	9.5	12	10	7	1.9	2.6	5.0	385	*27	16	21	*50
27	9.2	12	10	6.5	2.4	2.4	*5.2	440	26	18	19	64
28	8.8	11	9	6.4	2.9	2.6	5.4	325	28	24	18	76
29	7.7	10	8	6.4	-	*2.9	5.4	264	26	27	18	91
30	7.5	10	8	6.6	-----	2.6	5.4	261	26	26	*18	72
31	7	-----	8	5.4	-----	2.3	-----	231	-----	27	24	-----
Total	357.9	343.0	286	269.3	118.9	92.1	138.8	3857.2	1782	673	614	1159
Mean	11.5	11.4	9.2	8.69	4.25	2.97	4.63	124	59.4	21.7	19.8	38.6
Ac-ft	710	680	567	534	236	183	275	7,650	3,530	1,330	1,220	2,300

Calendar year 1960: Max 690 Min 6 Mean 56.2 Ac-ft 40,830

Water year 1960-61: Max 440 Min 1.9 Mean 26.6 Ac-ft 19,220

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Nov. 9-15, Dec. 2-22, Jan. 12-27. No gage-height record Oct. 30 to Nov. 3, Nov. 16 to Dec. 1, Dec. 23 to Jan. 11 (stage-discharge relation affected by ice during most of period), Sept. 5, 24-26.

## PLATEAU CREEK BASIN

9-968. Buzzard Creek below Owens Creek, near Heiberger, Colo.

Location--Lat 39°14', long 107°38', in N½ sec.35, T.9 S., R.92 W., on left bank 500 ft downstream from Owens Creek, 2½ miles upstream from Porter Creek, 4¼ miles southeast of Hightower ranger station, and 8½ miles southeast of Heiberger.

Drainage area--52.2 sq mi.

Records available--October 1955 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 8,215 ft (from topographic map).

Average discharge--6 years, 22.9 cfs (16,580 acre-ft per year).

Extremes--Maximum discharge during year, 218 cfs May 22 (gage height, 4.14 ft); no flow for many days.  
1955-61: Maximum discharge, 636 cfs June 4, 1957 (gage height, 5.82 ft); no flow at times 1956-61.

Remarks--Records fair except those for periods of no gage-height record or indefinite stage-discharge relation, which are poor.  
Natural flow of stream affected by diversions above station from Owens Creek to West Divide Creek basin for irrigation.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.9			1.2	1.6	10	76	77	3.5	0	0
2	0					1.8	10	88	62	3.2	.1	.1
3	0					1.6	12	88	48	2.7	.2	1.0
4	0					1.6	15	85	38	2.6	.2	1.3
5	0					1.6	18	69	35	2.3	.2	1.7
6	0	0.9			1.2	1.4	*20	56	33	2.1	.2	2.8
7	0					1.2	19	55	31	2.0	.1	3.1
8	0					1.4	17	55	28	2.0	0	3.0
9	.1					1.6	16	*60	26	1.6	0	3.2
10	*.2					1.6	16	87	28	1.3	*0	4.2
11	.4	1		1	1.6	1.8	17	126	28	1.3	0	3.1
12	.4					2.0	20	144	26	.9	0	2.4
13	.4					2.2	19	115	*22	.6	0	2.0
14	.4					2.6	17	75	18	.4	.1	1.9
15	.5					3.2	16	70	15	.3	.1	1.9
16	.5	1		1	1.6	5	17	75	13	.2	.3	2.0
17	.6					10	20	83	13	0	.4	2.6
18	.6					11	24	*115	11	0	.3	2.9
19	.7					9	26	148	9.0	0	.2	6.8
20	.7					8	24	135	7.8	*0	.1	7.0
21	.7	1			1.6	7.5	22	121	6.3	0	.1	5.2
22	.7					9	26	152	5.6	0	0	9.0
23	.7					11	30	150	4.6	0	0	14
24	.7					13	*32	132	3.9	0	0	15
25	.7					12	28	126	3.6	0	.1	11
26	.7	1			1.6	11	27	132	*3.3	0	.2	12
27	*.7					10	27	133	3.3	0	.2	*12
28	.7					10	47	123	3.3	0	.2	11
29	.7					10	66	*132	3.0	0	.2	15
30	.7					10	70	121	2.9	0	*.2	13
31	.7	1			1.6	11	-----	94	-----	0	0	-----
Total	13.2	28.5	31	31	40.8	184.7	728	3,221	608.6	27.0	3.7	170.2
Mean	0.43	0.95	1	1	1.5	5.96	24.3	104	20.3	0.87	0.12	5.67
Ac-ft	26	57	61	61	81	366	1,440	6,390	1,210	54	7.3	338

Calendar year 1960: Max 275 Min 0 Mean 18.4 Ac-ft 13,340

Water year 1960-61: Max 152 Min 0 Mean 13.9 Ac-ft 10,090

Peak discharge (base, 200 cfs)--May 22 (9:30 p.m.) 218 cfs (4.14 ft).

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation indefinite Oct. 10 to Nov. 14, Aug. 2-7, 14-21, 25-29. No gage-height record Nov. 15 to Apr. 24 (stage-discharge affected by ice during most of period).



## PLATEAU CREEK BASIN

209

9-975. Buzzard Creek near Collbran, Colo.

Location.--Lat 39°16'20", long 107°51'00", in sec.14, T.9 S., R.94 W., on right bank 150 ft upstream from county bridge, half a mile upstream from Brush Creek, and 7 miles east of Collbran.

Drainage area.--139 sq mi.

Records available.--September 1921 to September 1961. Prior to October 1933 monthly discharge only, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 6,955 ft (from topographic map).

Average discharge.--40 years, 47.7 cfs (34,530 acre-ft per year).

Extremes.--Maximum discharge during year, 318 cfs May 12 (gage height, 3.67 ft); no flow Oct. 1-5.

1921-61: Maximum discharge, 1,630 cfs May 14, 1941 (gage height, 7.80 ft), from rating curve extended above 900 cfs; no flow for many days in 1959-60.

Remarks.--Records fair except those for periods of ice effect or indefinite stage-discharge relation, which are poor. Diversions for irrigation of about 1,300 acres above station. Erie Canal imports water from Plateau Creek for irrigation of about 280 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.0	2.4	1.0	0.5	2.4	1.3	1.28	1.00	2.8	2.2	1.6
2	0	1.2	2.4	.9	*.8	2.6	1.4	1.42	.78	2.6	2.4	1.4
3	0	1.2	2.0	.9	1.0	2.8	2.4	1.55	.61	2.8	2.6	1.8
4	0	*1.0	1.8	.9	.9	2.8	3.9	1.56	.45	3.2	2.4	1.8
5	0	1.0	1.4	1.0	.8	2.8	3.4	1.26	.37	2.8	2.2	2.0
6	.1	1.2	1.6	1.1	.8	2.8	2.9	.97	.33	2.4	2.0	2.4
7	.2	1.2	1.6	1.2	1.0	2.6	2.8	.85	.31	2.4	1.6	2.6
8	.3	1.0	1.6	1.2	1.0	2.4	2.2	.87	.30	2.8	1.2	3.0
9	.5	.8	1.6	*1.2	1.2	2.6	1.8	.86	.28	2.8	*.9	3.4
10	*.7	.8	1.6	1.2	1.4	3.0	1.8	1.11	.29	2.6	.6	3.6
11	.9	1.0	1.6	1.0	2.0	3.2	1.3	1.84	.33	2.4	.8	4.0
12	*.9	1.2	1.6	.9	2.2	3.2	1.5	*2.26	.32	2.2	1.0	3.8
13	.4	1.4	1.5	.7	2.4	3.4	2.5	2.09	*2.6	2.2	1.0	3.4
14	.8	1.2	1.5	.7	2.6	5.0	1.7	1.19	.22	2.0	1.2	3.4
15	.6	1.2	1.4	.9	2.8	9.0	1.2	1.07	.20	2.2	1.4	3.6
16	.5	1.0	1.3	1.2	3.0	1.5	1.0	1.04	.18	2.4	1.6	3.6
17	.5	.8	1.3	1.2	2.8	2.0	1.8	1.13	.17	2.4	1.8	3.8
18	.5	.8	1.4	1.2	2.6	1.6	4.2	1.39	.14	2.2	2.0	5.0
19	.6	1.0	1.4	1.1	2.2	1.4	7.4	2.00	.11	2.0	1.8	9.0
20	.8	1.2	1.6	1.0	2.4	1.2	9.2	2.02	8.0	*1.6	1.4	1.2
21	.9	1.2	1.6	.9	3.0	1.0	7.0	1.37	5.0	2.0	1.2	1.6
22	.9	1.4	1.6	.8	2.8	1.2	6.5	*1.95	4.0	2.3	1.2	1.8
23	1.0	1.4	1.6	.9	*2.8	1.4	7.9	2.04	3.2	2.0	1.2	2.8
24	.9	1.6	1.4	1.0	2.4	1.8	*6.2	1.77	3.6	1.6	1.4	2.4
25	1.0	1.8	1.2	1.1	2.6	1.6	3.8	1.53	3.6	1.8	*1.6	1.8
26	1.2	2.0	1.2	1.0	2.6	1.4	3.4	1.61	*3.4	2.0	1.8	*1.6
27	1.4	2.0	1.0	.8	2.4	1.4	4.2	1.58	3.6	2.2	1.6	1.4
28	1.0	1.6	1.0	.7	2.2	1.4	6.7	1.45	3.2	2.2	1.4	1.4
29	.8	1.4	.9	.5	-	*1.3	9.6	1.31	2.8	2.0	1.4	1.8
30	.6	*2.0	1.0	.4	-----	1.0	1.13	1.31	2.8	2.2	1.2	1.8
31	.8	-----	1.0	.4	-----	1.1	-----	1.13	-----	2.2	1.0	-----
Total	18.8	37.6	46.1	29.0	55.2	273.6	1,223	4,481	708.2	71.3	47.1	259.2
Mean	0.61	1.25	1.49	0.94	1.97	8.83	40.8	145	23.6	2.30	1.52	8.64
Ac-ft	37	75	91	58	109	543	2,430	8,890	1,400	141	93	514

Calendar year 1960: Max 375 Min 0 Mean 31.3 Ac-ft 22,700  
 Water year 1960-61: Max 226 Min 0 Mean 19.9 Ac-ft 14,380

Peak discharge (base, 350 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation indefinite Oct. 6-11, Oct. 14 to Nov. 3, June 18 to July 20, July 23 to Aug. 8, Aug. 11 to Sept. 30. Stage-discharge relation affected by ice Nov. 7 to Mar. 26 (no gage-height record Dec. 28 to Jan. 9).

## PLATEAU CREEK BASIN

9-976. Brush Creek near Collbran, Colo.

Location.--Lat 39°19'30", long 107°50'30", in W $\frac{1}{4}$  sec. 36, T.8 S., R.94 W., on right bank at site of former highway bridge, 1 mile downstream from West Brush Creek, 4 miles upstream from mouth, and 8 $\frac{1}{2}$  miles northeast of Collbran.

Drainage area.--10.6 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,183 ft (from topographic map).

Average discharge.--6 years, 7.07 cfs (5,120 acre-ft per year).

Extremes.--Maximum discharge during year, 55 cfs May 19 (gage height, 3.05 ft); minimum daily determined, 0.1 cfs Apr. 1, 2, 1955-61: Maximum discharge, 317 cfs June 7, 1957 (gage height, 4.35 ft); minimum daily determined, 0.1 cfs Apr. 1, 2, 1961.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 30 to Apr. 8, July 31 to Aug. 24)

Oct. 1 to Aug. 24

Aug. 25 to Sept. 30

1.5	0	1.9	0.9
1.6	.4	2.0	1.6
1.7	1.2	2.2	3.6
1.9	4.0	2.3	5.0
2.1	9.0		
2.5	24		
2.9	46		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	1.0					0.1	1.4	1.8	4.2	1.3	1.3
2	.6	1.0			(*)		.1	1.6	1.6	4.0	7.8	1.6
3	.6	1.0					.9	1.7	1.5	3.8	3.2	2.0
4	.6	*1.0					4.6	1.6	1.4	3.6	2.2	2.0
5	.6	1.0					3.7	1.2	1.3	3.6	1.6	2.2
6	.6	1.0					1.0	1.0	1.3	3.4	1.2	2.5
7	.6						.8	9.5	1.2	3.2	1.2	2.3
8	.6						.4	9.5	1.2	3.0	1.1	2.2
9	.8			(*)			.4	1.0	1.1	2.6	*1.2	2.8
10	*1.5						.4	1.5	1.0	2.1	1.1	2.1
11	2.0						.4	2.6	1.1	2.0	1.0	1.9
12	2.2						.4	*3.6	1.2	1.7	1.1	1.8
13	1.8						.4	3.2	1.1	1.7	1.0	1.6
14	1.6						.4	2.3	1.0	1.7	1.0	1.6
15	1.4					1.2	.3	2.0	*.9	1.6	1.0	1.7
16	1.2		1	0.6	1		.6	2.3	7.2	1.3	1.8	1.8
17	.9						2.4	2.6	6.6	1.2	2.1	1.8
18	.8	1.2					4.6	3.4	6.0	1.2	1.2	2.4
19	.7						6.5	4.3	5.8	1.1	1.0	2.7
20	.7						8	4.1	5.6	1.3	.9	2.3
21	.6						7	3.8	5.6	*1.3	1.0	2.5
22	.6						8	*3.6	5.4	1.1	.9	3.2
23	.6					(*)	9	3.6	5.4	1.0	.8	3.3
24	.6						*6	3.4	5.2	1.1	1.0	3.4
25	.6						5	2.8	5.2	1.2	*1.5	3.5
26	.7						3.4	2.8	*4.8	1.0	1.4	*3.9
27	.7						*3.0	2.8	4.6	1.0	1.2	3.9
28	.8						3.8	2.6	4.6	1.0	1.1	3.6
29	.8					(*)	8.1	2.4	4.8	1.0	1.2	4.0
30	.8	(*)					1.7	1.2	2.2	3.4	1.2	3.2
31	1.0						1.0		2.0	2.0	1.5	
Total	28.1	34.8	31	18.6	28	37.5	101.7	753.0	268.4	63.4	46.8	75.1
Mean	0.91	1.16	1	0.6	1	1.21	3.39	24.3	8.95	2.05	1.51	2.50
Ac-ft	56	69	61	37	56	74	202	1,490	532	126	93	149

Calendar year 1960: Max 64 Min 0.2 Mean 5.51 Ac-ft 4,000  
Water year 1960-61: Max 43 Min 0.1 Mean 4.07 Ac-ft 2,940

Peak discharge (base, 50 cfs)--May 19 (1:30 p.m.) 55 cfs (3.05 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7-15. No gage-height record Oct. 11-16, Nov. 16 to Mar. 29, Apr. 9-27 (stage-discharge relation affected by ice most of periods), May 1-12, May 25 to June 15.

PLATEAU CREEK BASIN

211

9-1050. Plateau Creek near Cameo, Colo.

Location.--Lat 39°11'00", long 108°16'10", in NW¼SW¼ sec.18, T.10 S., R.97 W., on left bank 300 ft from State Highway 65, 1.1 miles upstream from mouth, and 4 miles northeast of Cameo.

Drainage area.--604 sq mi.

Records available.--October 1935 to September 1961. Prior to May 1936 monthly discharge only, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 4,836 ft (from topographic map). Prior to Aug. 27, 1936, staff gage at same site and datum.

Average discharge.--26 years, 191 cfs (138,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,030 cfs May 27 (gage height, 4.34 ft); minimum daily, 19 cfs July 12, 16.

1935-61: Maximum discharge, 3,920 cfs May 27, 1942 (gage height, 7.73 ft), from rating curve extended above 3,000 cfs; minimum daily, 13 cfs July 31, 1959.

Remarks.--Records good except those for period of ice effect, which are fair. Natural flow of stream affected by storage reservoirs, diversions for irrigation of about 25,000 acres, and return flow from irrigated areas.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	16	2.5	215
1.7	34	3.0	385
1.9	63	3.5	585
2.1	104	3.7	685

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	61	63	50	*44	40	61	197	357	24	29	42
2	35	63	65	50	44	47	63	215	371	22	73	40
3	37	*61	74	46	40	55	69	245	301	21	63	100
4	38	63	76	40	44	52	*102	239	227	21	39	78
5	38	60	71	36	44	53	100	248	132	21	35	73
6	38	58	60	40	40	53	89	236	71	20	31	73
7	*38	69	60	46	44	43	97	161	*76	21	*31	74
8	37	76	70	40	44	43	95	147	71	20	33	74
9	40	71	75	*40	50	44	78	*155	61	21	33	192
10	44	60	75	40	50	53	93	167	58	22	33	114
11	63	65	75	40	50	57	89	248	71	22	33	93
12	67	69	70	46	60	55	71	357	76	19	32	82
13	63	69	65	46	55	57	74	364	67	20	32	76
14	80	67	70	46	58	67	76	248	57	20	31	74
15	80	71	60	46	55	82	58	194	52	21	31	71
16	67	57	48	40	58	112	58	164	52	19	30	76
17	67	65	65	40	61	122	60	206	50	20	72	106
18	69	67	75	44	60	122	74	194	47	20	37	179
19	67	72	70	44	46	84	112	315	43	22	33	173
20	67	65	65	40	53	84	142	413	40	*25	27	139
21	65	65	65	40	57	78	*145	284	37	25	26	132
22	65	69	70	36	55	67	142	*467	35	26	25	179
23	65	67	70	38	55	76	167	585	35	27	25	262
24	61	63	55	42	*43	97	147	499	34	27	24	430
25	61	67	60	44	49	102	129	452	32	26	64	221
26	60	67	60	40	50	69	104	483	31	24	44	206
27	60	69	65	36	42	61	91	650	*29	24	43	206
28	60	60	60	32	47	60	102	585	23	24	34	209
29	61	52	50	34	-	60	139	*444	24	24	43	*262
30	58	*74	50	38	-----	60	176	424	26	24	*43	236
31	55	-----	46	44	-----	57	-----	402	-----	29	43	-----
Total	1,741	1,962	2,003	1,284	1,398	2,112	3,003	9,988	2,586	701	1,172	4,272
Mean	56.2	65.4	64.6	41.4	49.9	68.1	100	322	86.2	22.6	37.8	142
Ac-ft	3,450	3,890	3,970	2,550	2,770	4,190	5,960	19,810	5,130	1,390	2,320	8,470

Calendar year 1960: Max 1,110 Min 16 Mean 125 Ac-ft 90,540  
Water year 1960-61: Max 650 Min 19 Mean 88.3 Ac-ft 63,900

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 6 to Feb. 13.

## GUNNISON RIVER BASIN

9-1085. Taylor Park Reservoir at Taylor Park, Colo.

Location.--Lat 38°49'05", long 106°36'15", in sec.24, T.14 S., R.83 W., at dam on Taylor River just downstream from Taylor Park, 17 miles northeast of Almont.

Records available.--October 1937 to September 1961. Prior to October 1938, published in WSP 1313.

Gage.--Staff gage read once or twice daily. Datum of gage is 9,187 ft above mean sea level (Bureau of Reclamation bench mark); gage readings have been reduced to elevations above mean sea level.

Extremes.--Maximum contents observed during year, 94,560 acre-ft June 30, July 1 (elevation, 9,324.20 ft); minimum, 17,450 acre-ft Oct. 16, 17 (elevation, 9,258.70 ft).  
1937-61: Maximum contents observed, 111,000 acre-ft July 1, 1957; minimum (after first filling), 8,780 acre-ft Oct. 19, 20, 1956.

Remarks.--Reservoir is formed by an earth- and rock-fill dam. Dam completed by Bureau of Reclamation in September 1937. Capacity of reservoir, 106,200 acre-ft between elevations 9,187 (bottom of outlet gates) and 9,330 ft (crest of spillway). No dead storage. Water used for irrigation in Uncompahgre Valley. No other reservoirs of any consequence in Gunnison River basin. Figures given herein are usable contents.

Cooperation.--Records furnished by Uncompahgre Valley Water Users Association.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	9,272.20	26,510	-
Oct. 31.....	9,261.60	19,050	-7,460
Nov. 30.....	9,267.00	22,460	+3,410
Dec. 31.....	9,271.50	25,940	+3,480
Calendar year 1960.....	-	-	-15,030
Jan. 31.....	9,275.35	28,970	+3,030
Feb. 28.....	9,278.10	31,290	+2,320
Mar. 31.....	9,281.50	34,070	+2,780
Apr. 30.....	9,286.95	39,340	+5,270
May 31.....	9,307.20	65,310	+25,970
June 30.....	9,324.20	94,560	+29,250
July 31.....	9,310.50	70,720	-23,840
Aug. 31.....	9,290.10	42,930	-27,790
Sept. 30.....	9,294.80	48,640	+5,710
Water year 1960-61.....	-	-	+22,130

† Elevation at about 8 a.m.



9-1090. Taylor River below Taylor Park Reservoir, Colo.

Location.--Lat 38°48'50", long 106°36'40", in sec.24, T.14 S., R.83 W., on left bank 500 ft downstream from Taylor Park Reservoir Dam, 3/4 miles upstream from Lottis Creek, and 16 miles northeast of Almont.

Drainage area.--245 sq mi.

Records available.--June 1929 to September 1934 (monthly discharge only, published in WSP 1313), October 1938 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 9,169.67 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Nov. 11, 1952, at site 1,000 ft downstream at datum 1.00 ft lower. Oct. 15, 1946, to May 4, 1952, supplementary chain and staff gages just downstream from reservoir outlet at different sites and datums used during winter months.

Average discharge.--28 years, 184 cfs (133,200 acre-ft per year).

Extremes.--Maximum discharge during year, 712 cfs July 26 (gage height, 5.17 ft); minimum daily, 6.6 cfs Nov. 9. 1938-61: Maximum discharge, 2,270 cfs July 1, 1957 (gage height, 7.56 ft); no flow May 1 to July 3, 1940, May 7-22, 1942, May 5-21, 1943.

Remarks.--Records good. Flow regulated by Taylor Park Reservoir (see preceding page) since 1937. One small diversion from Willow Creek above reservoir.

Cooperation.--One discharge measurement furnished by Uncompahgre Valley Water Users Association.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 16 to May 9)

2.1	5.0	2.6	23	4.0	265
2.2	7.0	3.0	61	5.0	640
2.4	13	3.5	137	6.0	1,100

Discharge, in cubic feet per second, water year 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	419	*38	*9.4	9.4	9.7	10	10	11	11	235	508	628
2	419	50	9.4	9.4	9.7	10	10	11	11	304	426	620
3	426	64	9.4	9.4	9.7	10	10	11	12	363	310	484
4	*426	16	9.4	9.4	9.7	10	10	11	12	391	262	310
5	422	8.8	9.4	9.4	9.7	10	10	11	12	440	262	144
6	419	11	9.4	9.4	9.7	10	10	11	*12	472	318	65
7	390	11	9.4	9.4	9.7	10	10	11	12	472	456	42
8	419	10	9.4	9.4	9.7	10	10	11	12	468	516	43
9	416	6.6	9.4	9.4	9.7	10	10	11	12	468	540	44
10	412	9.7	9.4	*9.4	9.7	10	10	11	12	374	596	44
11	366	8.8	9.4	9.4	9.7	10	11	11	12	335	604	44
12	342	8.8	9.4	9.4	9.7	10	11	11	12	426	604	44
13	279	8.8	9.4	9.4	9.7	10	11	11	12	472	600	*45
14	205	8.5	9.4	9.4	9.7	10	11	11	12	552	600	46
15	114	8.8	9.4	9.4	9.7	10	11	11	12	572	600	46
16	80	8.8	9.4	9.4	10	10	11	*11	12	560	584	46
17	33	8.8	9.4	9.4	10	10	11	11	12	636	*476	46
18	12	8.8	9.4	9.4	10	10	*11	11	12	656	433	46
19	12	8.8	9.4	9.4	10	10	11	11	12	660	433	39
20	18	8.8	9.4	9.4	10	10	11	11	12	*584	433	26
21	23	8.8	9.4	9.4	10	10	11	11	12	560	492	16
22	23	8.8	9.4	9.4	10	10	11	11	12	504	576	14
23	24	8.5	9.4	9.4	10	10	11	11	11	480	664	12
24	24	8.5	9.4	9.4	10	10	11	11	11	576	698	13
25	25	8.8	9.4	9.4	10	10	11	11	11	628	689	13
26	25	8.8	9.4	9.4	10	10	11	11	9.7	664	636	13
27	25	8.8	9.4	9.4	10	10	11	11	9.7	680	612	13
28	25	8.8	9.4	9.4	10	10	11	11	68	680	664	13
29	25	8.8	9.4	9.4	-	10	11	11	121	652	698	12
30	25	9.1	9.4	9.4	-----	10	11	11	150	644	680	13
31	25	-----	9.4	9.4	-----	10	-----	11	-----	584	632	-----
Total	5,898	400.5	291.4	291.4	275.5	310	320	341	653.4	16,092	16,602	2,984
Mean	190	13.4	9.40	9.40	9.84	10.0	10.7	11.0	21.8	519	536	99.5
Ac-ft	11,700	794	578	578	546	615	635	676	1,300	31,920	32,930	5,920

Calendar year 1960: Max 970 Min 6.6 Mean 206 Ac-ft 149,600  
Water year 1960-61: Max 698 Min 6.6 Mean 122 Ac-ft 88,190

\* Discharge measurement made on this day.

Note.--Discharge computed from once-daily chain-gage readings Dec. 1 to Apr. 17.

## GUNNISON RIVER BASIN

9-1100. Taylor River at Almont, Colo.

Location.--Lat 38°40', long 106°51', in sec.22, T.51 N., R.1 E., on left bank at Almont, 15 ft downstream from bridge on State Highway 306 and 800 ft upstream from confluence with East River.

Drainage area.--440 sq mi, approximately.

Records available.--July 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 8,010.76 ft above mean sea level, datum of 1929. Prior to Apr. 16, 1922, staff gage at same site and datum.

Average discharge.--51 years, 342 cfs (247,600 acre-ft per year).

Extremes.--Maximum discharge during year, 824 cfs Aug. 25, 30 (gage height, 2.77 ft); minimum daily, 45 cfs for many days during winter. 1910-61: Maximum discharge observed, 3,760 cfs June 9, 1920 (gage height, 5.0 ft), from rating curve extended above 2,300 cfs; maximum gage height, 5.32 ft July 1, 1957; minimum discharge observed before storage began in Taylor Park Reservoir, 50 cfs for several days in August 1913 (gage height, 1.2 ft); minimum daily, 24 cfs Mar. 12, 1938.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated since September 1937 by Taylor Park Reservoir (see elsewhere in this report), 24 miles above station. Diversions for irrigation of about 360 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	44	1.6	225
1.0	73	2.0	385
1.3	135	2.8	830

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	460	*98	*55	50	50	50	55	150	349	332	634	728
2	465	108	60	50	50	50	55	175	344	372	540	728
3	455	148	60	45	55	50	60	178	300	445	475	644
4	*470	90	60	45	55	50	75	*166	268	475	380	440
5	460	75	60	50	50	50	75	142	268	512	376	296
6	455	70	55	50	45	50	65	118	*264	573	380	197
7	427	78	55	50	45	50	65	112	280	568	512	148
8	460	75	55	50	45	45	60	100	280	568	606	145
9	460	60	60	50	45	45	50	108	304	556	628	160
10	460	50	60	*50	45	45	55	158	312	496	716	166
11	425	55	60	50	45	50	55	214	296	425	716	145
12	385	60	60	50	45	50	50	214	284	470	722	135
13	340	60	55	50	45	50	55	187	264	540	716	*122
14	280	60	50	50	50	50	50	150	250	600	728	122
15	197	60	50	55	50	55	50	160	239	674	716	112
16	135	60	50	55	50	55	54	152	246	668	716	96
17	125	60	55	50	50	50	57	150	228	704	*584	96
18	70	60	55	50	45	50	*65	166	218	764	512	98
19	68	60	55	50	45	50	73	211	208	764	502	112
20	68	60	55	50	45	50	85	239	194	*710	490	106
21	78	60	55	50	45	*50	85	218	*184	668	529	102
22	76	60	55	50	45	50	82	264	181	634	639	138
23	76	60	55	50	45	55	90	*280	166	584	740	160
24	76	60	55	50	45	60	90	260	155	650	788	142
25	75	65	55	50	45	55	80	280	152	734	794	128
26	75	65	55	55	50	55	73	308	145	758	776	120
27	75	65	55	55	50	55	70	308	135	782	734	115
28	75	60	50	60	*50	55	76	328	145	782	752	115
29	76	55	50	55	-	55	94	320	236	770	806	115
30	70	55	45	45	-----	55	122	340	236	758	806	118
31	75	-----	45	*50	-----	55	-----	344	-----	710	734	-----
Total	7,492	2,052	1,700	1,570	1,330	1,595	2,071	6,500	7,131	19,046	19,747	60,49
Mean	242	68.4	54.8	50.6	47.5	51.5	69.0	210	238	614	637	202
Ac-ft	14,860	4,070	3,370	3,110	2,640	3,160	4,110	12,890	14,140	37,780	39,170	12,000

Calendar year 1960: Max 1,350 Min 30 Mean 312 Ac-ft 226,800  
 Water year 1960-61: Max 806 Min 45 Mean 209 Ac-ft 151,300

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 9 to Apr. 14 (no gage-height record Nov. 16 to Mar. 21).

9-1125. East River at Almont, Colo.

Location.--Lat 38°40', long 106°51', in sec.22, T.51 N., R.1 E., on left bank at Almont, 200 ft upstream from bridge on State Highway 135 and 400 ft upstream from confluence with Taylor River.

Drainage area.--295 sq mi.

Records available.--April to October 1905, July 1910 to September 1922, October 1934 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 8,006.29 ft above mean sea level, datum of 1929. Apr. 16 to Sept. 30, 1905, and July 27, 1910, to Apr. 30, 1922, staff gages at bridge 200 ft downstream at different datums. Oct. 1, 1934, to Sept. 22, 1954, water-stage recorder at present site at datum 2.00 ft higher.

Average discharge.--39 years, 345 cfs (249,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,650 cfs May 26 (gage height, 4.96 ft); minimum daily, 40 cfs Feb. 7, 8. 1905, 1910-22, 1934-61: Maximum discharge observed, 6,500 cfs June 15, 1921 (gage height, 6.6 ft, site and datum then in use), from rating curve extended above 3,000 cfs; minimum daily, 19 cfs Aug. 13, 1913.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 7,400 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	*104	*60	55	45	51	65	535	1,330	302	146	78
2	72	104	65	50	45	51	68	678	1,230	284	158	78
3	75	104	70	50	45	49	86	734	972	266	167	95
4	*75	101	70	50	45	49	107	*678	825	249	143	122
5	75	95	65	50	45	49	107	535	769	249	140	122
6	72	92	60	50	45	49	98	427	*783	235	149	125
7	72	95	55	50	40	49	104	379	790	238	146	98
8	72	98	60	50	40	42	95	340	884	232	137	92
9	72	90	60	50	45	42	83	340	1,070	214	134	104
10	72	85	60	*50	45	51	92	431	1,200	197	125	155
11	68	90	60	50	45	49	80	606	1,090	191	119	146
12	70	95	60	50	45	49	75	797	1,000	207	116	125
13	70	95	55	50	45	47	89	708	988	197	116	*116
14	75	90	50	50	45	49	80	505	932	194	113	107
15	75	90	50	55	50	51	70	447	839	218	113	104
16	75	85	50	55	50	60	78	443	846	232	113	89
17	78	80	50	50	45	62	80	473	783	204	*116	86
18	83	85	55	50	45	62	*98	560	769	182	119	92
19	83	90	60	50	45	60	116	741	702	167	116	128
20	98	90	55	50	45	68	164	868	672	*161	110	131
21	119	85	55	50	45	*65	176	839	*624	170	110	152
22	122	80	55	50	45	60	178	1,080	565	158	101	204
23	119	80	60	50	45	65	235	*1,260	525	140	86	246
24	113	80	55	50	45	72	238	1,160	496	137	86	242
25	119	80	55	50	45	68	194	1,330	455	134	92	200
26	113	80	55	55	45	65	179	1,480	419	134	89	197
27	107	85	55	55	50	65	173	1,360	391	134	80	197
28	107	70	55	55	*50	65	197	1,440	354	137	78	200
29	107	65	50	50	-	62	274	1,350	336	146	78	210
30	101	60	50	45	-----	65	403	1,370	316	155	78	218
31	98	-----	50	*45	-----	60	-----	1,320	-----	149	78	-----
Total	2,727	2,623	1,765	1,570	1,270	1,751	4,082	25,214	22,955	6,013	3,552	4,259
Mean	88.0	87.4	56.9	50.6	45.4	56.5	136	813	765	194	115	142
Ac-ft	5,410	5,200	3,500	3,110	2,520	3,470	8,100	50,010	45,530	11,930	7,050	8,450

Calendar year 1960: Max 1,500 Min 43 Mean 247 Ac-ft 179,500

Water year 1960-61: Max 1,480 Min 40 Mean 213 Ac-ft 154,300

Peak discharge (base, 1,600 cfs)--May 26 (2 a.m.) 1,650 cfs (4.96 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9 to Feb. 28, Mar. 8, 9 (no gage-height record Jan. 8 to Feb. 28).

## GUNNISON RIVER BASIN

9-1133. Ohio Creek at Baldwin, Colo.

Location.--Lat 38°45'50" (revised), long 107°02'55" (revised), in NW $\frac{1}{4}$  sec. 7, T.15 S., R.86 W., on left bank a quarter of a mile northwest of Baldwin and 0.6 mile downstream from Castle Creek.

Drainage area.--48 sq mi, approximately.

Records available.--October 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,595 ft (from topographic map).

Extremes.--Maximum discharge during year, 246 cfs May 19 (gage height, 3.14 ft); minimum daily determined, 7.8 cfs July 19.  
1958-61: Maximum discharge, 270 cfs June 8, 1960 (gage height, 3.18 ft); minimum daily, 4.7 cfs Sept. 15, 1959.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of 1,750 acres. Two diversions above station for irrigation below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	7.0	2.4	67
1.7	9.5	2.7	120
1.9	18	3.0	195
2.1	31	3.1	230

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	*13	(*)				10	110	189	42	15	14
2	9.8	12					12	136	180	38	15	13
3	9.8	12					15	145	152	36	18	17
4	*11	12					20	*134	136	36	20	18
5	11	12					22	107	145	28	18	22
6	11	11					22	87	*158	28	18	21
7	11	13					20	75	162	29	17	19
8	11	12			9		18	67	171	25	16	18
9	11	10		(*)			17	80	168	23	15	22
10	12	10				9	17	110	158	21	15	45
11	13	10					17	143	142	19	20	29
12	12	10					18	163	132	16	19	22
13	12	10					17	142	126	16	17	*20
14	12	10					17	109	118	15	15	19
15	13	10					19	103	114	15	15	16
16	13	9	10	10			19	110	105	14	22	21
17	15	9					20	124	114	13	*29	24
18	16	9					*24	148	112	9.8	21	38
19	16	10					36	183	107	7.8	19	38
20	14	10					48	189	97	*9.0	17	29
21	13	10				*9	44	171	*92	11	16	28
22	13	10			8	10	46	202	78	8.8	15	51
23	13	10				10	60	*220	70	8.2	14	53
24	13	10				11	44	195	67	8.2	14	43
25	12	10				12	36	202	64	11	18	31
26	13	10				11	30	212	56	15	16	31
27	12	10				10	34	195	51	15	14	31
28	13	9			(*)	10	50	209	46	13	13	33
29	12	9.5				10	75	206	48	13	13	30
30	11	9.5		(*)		10	95	206	46	13	13	26
31	12	-----			-----	10	-----	202	-----	13	14	-----
Total	380.1	312.0	310	310	239	293	922	4,695	3,404	569.8	521	822
Mean	12.3	10.4	10	10	8.5	9.45	30.7	151	113	18.4	16.8	27.4
Ac-ft	754	619	615	615	474	581	1,830	9,310	6,750	1,130	1,030	1,630

Calendar year 1960: Max 220 Min 6.6 Mean 39.1 Ac-ft 28,400  
Water year 1960-61: Max 220 Min 7.8 Mean 35.0 Ac-ft 25,340

Peak discharge (base, 300 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29-31, Nov. 9 to May 1 (no gage-height record Nov. 19 to Mar. 20).



9-1135. Ohio Creek near Baldwin, Colo.

Location.--Lat 38°42', long 107°00', in SW $\frac{1}{4}$  sec.34, T.15 S., R.86 W., on right bank 600 ft upstream from bridge, 800 ft downstream from Mill Creek,  $\frac{5}{8}$  miles southeast of Baldwin, and 11 miles upstream from mouth.

Drainage area.--124 sq mi.

Records available.--April 1940 to September 1950, October 1958 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 8,180 ft (by barometer). Prior to Apr. 3, 1942, staff gage at same site and datum. Apr. 3, 1942, to Sept. 30, 1950, water-stage recorder at present site and datum.

Average discharge.--13 years, 90.3 cfs (65,370 acre-ft per year).

Extremes.--Maximum discharge during year, 383 cfs May 22 (gage height, 2.22 ft); minimum daily determined, 10 cfs Oct. 1-3.

1940-50, 1958-61: Maximum discharge, 1,260 cfs May 19, 1948 (gage height, 4.65 ft), from rating curve extended above 560 cfs; minimum daily, 6.9 cfs Sept. 12, 1960.

Floods in May 1952 and June 1957 reached a stage of 5.5 ft, from floodmarks (discharge, about 1,500 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of 3,850 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 7

Apr. 8 to Sept. 30

0.2	6.5	0.4	14	1.1	75
.4	11	.5	18	1.4	131
.7	26	.8	39	2.2	355

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	*17	(*)				20	190	299	71	33	20
2	10	15					22	222	281	62	33	18
3	10	15					30	233	242	57	37	25
4	*11	15					60	*222	214	57	33	29
5	11	14					50	188	216	51	29	31
6	11	14					46	156	*236	48	27	33
7	11	18					30	142	251	51	22	29
8	11	18			13	14	34	121	248	50	20	26
9	12	14					31	129	257	43	18	30
10	14	14		(*)			28	190	251	41	17	54
11	15	14					28	254	233	38	20	41
12	14	14					28	272	219	35	23	33
13	13	14					31	242	203	30	19	*30
14	13	14					25	186	193	28	17	28
15	14	14					28	176	173	28	17	23
16	15	13	15	15		15	30	183	173	26	22	22
17	17	13					17	39	203	166	23	37
18	19	13					20	*56	245	166	23	36
19	18	14					16	94	284	149	19	50
20	18	14					14	115	302	142	*20	36
21	16	14				*16	92	296	*135	25	21	35
22	15	14			12	18	96	327	123	23	19	61
23	15	14				20	113	*341	111	20	18	67
24	15	14				26	92	314	105	20	17	59
25	14	14				30	68	305	96	21	22	39
26	14	14				28	59	330	85	22	22	39
27	14	14				24	68	311	80	28	19	38
28	15	14			(*)	24	92	324	71	19	17	39
29	14	14				24	131	314	74	20	16	42
30	13	14				24	166	314	80	19	17	37
31	15	-----		(*)	-----	26	-----	314	-----	21	20	-----
Total	427	431	465	465	351	552	1,802	7,630	5,272	1,039	709	1,087
Mean	13.8	14.4	15	15	12.5	17.8	60.1	246	176	33.5	22.9	36.2
Ac-ft	847	855	922	922	696	1,090	3,570	15,130	10,460	2,060	1,410	2,160

Calendar year 1960: Max 418 Min 6.9 Mean 69.9 Ac-ft 50,720

Water year 1960-61: Max 341 Min 10 Mean 55.4 Ac-ft 40,120

Peak discharge (base, 450 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29-31, Nov. 9 to Apr. 7 (no gage-height record Nov. 17 to Mar. 21).

## GUNNISON RIVER BASIN

9-1145. Gunnison River near Gunnison, Colo.

Location.--Lat 38°32'50", long 106°57'00", on line between secs. 34 and 35, T.50 N., R.1 W., on right bank 1,500 ft downstream from Antelope Creek and 1 mile west of Gunnison.

Drainage area.--1,010 sq mi, approximately.

Records available.--October 1910 to December 1928, October 1944 to September 1961. Monthly discharge only for some periods, published in WSP 1513.

Gage.--Water-stage recorder. Altitude of gage is 7,670 ft (from river-profile map). Nov. 25, 1910, to Dec. 31, 1928, staff or chain gages (supplementary water-stage recorder Apr. 28, 1916, to June 17, 1918) at bridge about 1 mile downstream at various datums.

Average discharge.--35 years, 790 cfs (571,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,030 cfs May 28 (gage height, 3.83 ft); minimum daily, 100 cfs Feb. 25.

1910-28, 1944-61: Maximum discharge observed, 11,400 cfs June 13, 1918 (gage height, 4.05 ft, site and datum then in use), from rating curve extended above 5,000 cfs; minimum daily determined, 90 cfs Feb. 21, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Taylor Park Reservoir (see elsewhere in this report), 37 miles above station. Diversions for irrigation of about 22,000 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	155
1.5	230
2.0	440
3.0	1,170
4.0	2,220

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	518	227	150	130	120	120	175	728	1,680	530	834	802
2	518	*236	160	130	120	120	178	898	1,630	542	749	810
3	518	260	160	120	120	120	209	978	1,310	616	735	842
4	*512	224	160	120	120	120	276	*874	1,150	637	581	714
5	518	200	150	120	120	120	296	714	1,090	672	548	588
6	524	190	140	120	110	120	242	554	1,090	763	554	470
7	494	203	140	130	110	120	251	476	*1,140	858	672	355
8	560	206	140	130	110	120	224	400	1,190	874	721	328
9	581	180	150	*130	120	110	192	370	1,320	763	721	350
10	567	170	150	130	110	120	215	500	1,480	700	802	410
11	536	180	150	130	110	120	192	756	1,410	581	794	385
12	470	190	150	130	110	120	185	970	1,280	595	802	320
13	440	200	140	130	110	120	209	890	1,230	679	794	288
14	380	200	130	130	120	130	188	637	1,190	714	786	*272
15	320	200	120	130	120	140	165	567	1,110	826	778	251
16	248	200	120	130	120	150	182	542	1,100	842	786	221
17	242	190	130	130	120	160	*195	567	1,030	850	707	218
18	206	190	140	120	120	160	224	672	994	906	*609	221
19	200	190	140	120	110	150	280	858	906	890	588	288
20	200	190	130	120	110	*160	355	*1,050	*858	*834	567	272
21	221	190	130	120	110	173	324	1,020	810	794	567	272
22	227	190	140	120	110	165	288	1,250	749	756	665	365
23	221	190	140	120	110	180	365	1,510	679	672	735	470
24	215	190	140	120	110	192	365	1,430	637	707	826	440
25	218	190	130	130	100	188	284	1,530	595	794	866	365
26	212	200	130	130	110	178	251	1,800	542	834	842	345
27	209	200	130	130	*120	171	242	1,720	470	906	763	336
28	206	190	130	130	120	169	272	1,850	452	938	778	332
29	206	170	130	130	-	163	365	1,700	482	946	858	350
30	198	*160	130	*130	-----	178	554	1,730	470	930	874	355
31	203	-----	120	120	-----	171	-----	1,700	-----	906	802	-----
Total	1 0888	5896	4300	3910	3200	4528	7743	31241	30074	23855	22704	12035
Mean	351	197	139	126	114	146	258	1,008	1,002	770	732	401
Ac-ft	21,600	11,690	8,530	7,760	6,350	8,980	15,360	61,970	59,650	47,320	45,030	23,870

Calendar year 1960: Max 2,550 Min 120 Mean 593 Ac-ft 430,600  
 Water year 1960-61: Max 1,850 Min 100 Mean 439 Ac-ft 318,100

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9-14. No gage-height record Nov. 15 to Mar. 20 (stage-discharge relation affected by ice during most of period).

9-1155. Tomichi Creek at Sargents, Colo.

Location.--Lat 38°24', long 106°25', in SW $\frac{1}{4}$  sec.21, T.48 N., R.5 E., on right bank 300 ft from U. S. Highway 50, half a mile downstream from Marshall Creek, and three-quarters of a mile south of Sargents.

Drainage area.--155 sq mi.

Records available.--October 1916 to September 1922, October 1937 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 8,420 ft (estimated from railroad elevation). May 12 to Oct. 5, 1917, staff gage and Oct. 6, 1917, to Sept. 30, 1922, water-stage recorder, at railroad bridge 1,000 ft upstream at different datum. Apr. 18, 1938, to Sept. 9, 1953, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--30 years, 64.2 cfs (46,480 acre-ft per year).

Extremes.--Maximum discharge during year, 287 cfs June 1 (gage height, 2.08 ft); minimum daily, 14 cfs Jan. 4. 1916-22, 1937-61: Maximum discharge, 804 cfs June 6, 1957 (gage height, 3.66 ft); minimum recorded, 6 cfs Nov. 16, 1920.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 1,900 acres above station. Larkspur ditch diverts water above station to Arkansas River basin (see elsewhere in this report).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	18
1.0	38
1.3	78
1.7	170
2.1	290

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	*30	*20	18	20	16	26	88	261	48	32	20
2	22	29	20	16	20	18	30	103	236	48	36	18
3	22	28	22	16	22	20	38	108	218	46	36	24
4	23	27	20	14	22	20	50	*103	198	47	37	29
5	*24	27	18	16	20	20	60	90	192	47	35	30
6	24	26	20	20	18	20	50	78	*181	45	30	35
7	23	30	20	20	16	20	44	76	178	48	28	34
8	23	28	22	22	18	18	39	72	178	52	28	29
9	24	26	22	*22	18	18	38	70	170	48	28	30
10	25	24	22	22	18	20	40	86	168	46	27	30
11	24	22	20	22	18	20	37	115	156	42	26	28
12	24	22	20	22	18	20	36	134	153	38	27	26
13	24	22	20	22	20	18	36	127	144	36	28	*25
14	24	24	18	22	18	18	30	124	136	37	30	24
15	25	24	16	22	18	20	30	115	141	38	27	24
16	28	20	18	20	18	22	35	103	139	35	30	30
17	32	22	20	20	18	24	38	103	127	30	*32	28
18	32	24	22	20	18	28	58	108	120	28	31	31
19	29	24	22	20	16	34	*58	132	110	26	25	39
20	29	24	20	20	18	40	58	156	100	26	22	40
21	28	22	22	20	18	38	56	165	*84	*31	26	40
22	28	22	22	20	18	*36	56	192	75	37	25	50
23	28	22	22	22	16	40	65	*195	76	30	25	53
24	28	22	20	24	16	48	59	195	65	26	25	49
25	27	22	20	24	16	42	52	212	64	28	27	41
26	28	22	20	24	18	38	47	218	59	29	26	39
27	28	22	22	22	20	30	47	229	54	36	24	39
28	30	22	22	20	*18	24	52	261	54	32	24	41
29	30	20	20	18	-	24	65	258	50	44	22	42
30	26	22	18	*20	-----	22	78	258	50	38	22	41
31	28	-----	16	20	-----	22	-----	255	-----	36	24	-----
Total	812	721	626	630	512	798	1,408	4,529	3,937	1,178	865	1,009
Mean	26.2	24.0	20.2	20.3	18.3	25.7	46.9	146	131	38.0	27.9	33.6
Ac-ft	1,610	1,430	1,240	1,250	1,020	1,580	2,790	8,980	7,810	2,340	1,720	2,000

Calendar year 1960: Max 280 Min 14 Mean 56.8 Ac-ft 41,210

Water year 1960-61: Max 261 Min 14 Mean 46.6 Ac-ft 33,770

Peak discharge (base, 200 cfs).--June 1 (3 a.m.) 287 cfs (2.08 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 9 to Apr. 7 (no gage-height record Dec. 1 to Mar. 22), Apr. 9, 12, 15.

## GUNNISON RIVER BASIN

9-1180. Quartz Creek near Ohio City, Colo.

Location.--Lat 38°33'35", long 106°38'10", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec. 27, T.50 N., R.3 E., on left bank 10 ft downstream from bridge on State Highway 162, 0.7 mile downstream from Willow Creek, 1.3 miles southwest of Ohio City, and 1.4 miles downstream from Gold Creek.

Drainage area.--106 sq mi.

Records available.--October 1937 to September 1950 (published as "near Ohio"), October 1959 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 8,430 ft (from topographic map). Prior to Oct. 1, 1945, at site 75 ft upstream at datum 3.00 ft higher. Oct. 1, 1945, to Sept. 30, 1950, at site 75 ft upstream at datum 2.00 ft higher.

Average discharge.--15 years, 53.7 cfs (38,880 acre-ft per year).

Extremes.--Maximum discharge during year, 240 cfs June 1 (gage height, 2.77 ft); minimum daily, 11 cfs Oct. 5-8, 11-14.

1937-50, 1959-61: Maximum discharge, 640 cfs May 26, 1942 (gage height, 5.90 ft, present datum), from rating curve extended above 470 cfs; maximum gage-height, 7.73 ft (present datum) July 31, 1945 (backwater from Flick Gulch, 225 ft below station); minimum daily discharge, 8.5 cfs Sept. 30, 1950.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 700 acres above and 200 acres below station. Slight regulation prior to 1946 by small powerplant 3 miles above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	9.0	2.2	80
1.7	18	2.5	150
1.9	36	3.0	325

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	*24	*16	16	18	18	16	47	208	46	42	29
2	13	23	18	15	18	18	17	51	194	43	46	28
3	13	24	18	14	18	18	21	53	165	43	47	34
4	12	24	18	14	18	18	28	*54	142	44	42	34
5	*11	24	16	14	18	18	28	47	148	43	39	35
6	11	24	16	14	16	18	23	42	148	43	35	37
7	11	27	14	14	14	18	24	39	*162	43	34	39
8	11	25	16	16	16	16	22	35	168	36	32	37
9	12	18	16	*16	16	16	20	36	174	36	32	46
10	12	16	16	16	18	18	22	47	171	37	32	44
11	11	18	16	16	18	18	20	64	156	30	32	40
12	11	20	16	16	18	18	20	75	150	32	34	35
13	11	20	14	16	20	18	20	72	138	33	34	32
14	11	20	12	16	18	18	19	64	132	32	36	*28
15	12	17	12	18	18	20	24	60	128	33	34	30
16	14	16	14	18	16	18	20	58	128	32	34	30
17	16	17	14	17	16	18	21	58	120	30	*42	29
18	18	20	14	16	16	18	27	66	112	29	43	29
19	18	20	16	16	16	20	*29	90	105	27	34	37
20	18	19	16	16	16	20	32	108	100	25	33	36
21	18	18	16	16	16	20	29	108	*94	*28	32	39
22	18	18	16	16	16	*20	28	140	90	27	30	47
23	17	18	16	16	16	18	33	153	80	27	29	53
24	18	18	14	16	14	18	29	*140	74	24	32	43
25	18	18	14	18	16	17	23	142	70	24	35	39
26	18	20	14	20	16	16	22	150	66	29	30	37
27	18	20	16	20	18	16	23	162	64	36	28	37
28	19	18	16	20	*18	16	27	180	60	43	27	40
29	19	16	14	20	-	16	35	171	54	46	26	42
30	16	14	14	*18	-----	16	43	187	47	49	27	40
31	18	-----	14	18	-----	16	-----	194	-----	47	28	-----
Total	456	594	472	512	472	551	745	2,893	3,648	1,097	1,061	1,106
Mean	14.7	19.8	15.2	16.5	16.9	17.8	24.8	93.3	122	35.4	34.2	36.9
Ac-ft	904	1,180	936	1,020	936	1,090	1,480	5,740	7,240	2,180	2,100	2,190

Calendar year 1960: Max 301 Min 11 Mean 47.1 Ac-ft 34,220  
 Water year 1960-61: Max 208 Min 11 Mean 37.3 Ac-ft 27,000

Peak discharge (base, 220 cfs).--June 1 (12:30 a.m.) 240 cfs (2.77 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9-26. No gage-height record Nov. 27 to Mar. 22 (stage-discharge relation affected by ice during most of period).



## GUNNISON RIVER BASIN

221

9-1190. Tomichi Creek at Gunnison, Colo.

Location--Lat 38°31'20", long 106°56'25", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 11, T.49 N., R.1 W., on right bank 300 ft downstream from highway bridge, 1.8 miles southwest of post office in Gunnison, and 2 miles upstream from mouth.

Drainage area--1,020 sq mi, approximately.

Records available--November and December 1910 (gage heights and discharge measurements only), October 1937 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "near Gunnison" 1910.

Gage--Water-stage recorder. Datum of gage is 7,628.58 ft above mean sea level, datum of 1929. Nov. 25 to Dec. 24, 1910, staff gage 300 ft upstream at different datum. Apr. 20, 1938, to Oct. 2, 1940, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge--24 years, 172 cfs (124,500 acre-ft per year).

Extremes--Maximum discharge during year, 384 cfs May 30 (gage height, 2.10 ft); minimum daily, 41 cfs Oct. 1.

1937-61: Maximum discharge, 1,900 cfs June 8, 1957 (gage height, 4.10 ft); minimum daily, 13 cfs Sept. 12, 14-16, 1956.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 24,000 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 21, Mar. 24 to Apr. 5)

0.9	40	1.5	170
1.1	70	2.1	400

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	90	90	60	60	60	132	128	340	68	110	68
2	43	90	102	55	60	65	128	135	344	68	122	68
3	*43	92	90	50	65	70	146	*135	332	68	138	80
4	44	95	85	45	65	70	194	135	316	63	143	98
5	45	98	80	50	60	70	260	132	*304	70	146	118
6	46	95	80	55	55	70	197	130	292	112	135	112
7	48	102	80	55	50	70	182	128	284	92	110	88
8	52	115	85	55	55	65	158	128	272	86	90	92
9	52	102	80	*55	60	60	122	102	280	80	84	95
10	53	86	80	55	60	65	149	84	296	76	82	100
11	56	82	80	55	60	70	138	82	304	62	82	100
12	58	84	80	55	60	70	125	98	296	63	88	*92
13	58	88	80	55	65	65	149	120	272	60	98	80
14	58	98	75	60	65	65	140	146	252	55	92	82
15	53	100	70	60	60	70	102	149	244	55	90	78
16	63	65	75	60	60	80	110	149	248	56	*88	82
17	78	70	80	55	65	90	*122	132	248	48	98	88
18	95	95	80	55	60	110	140	100	232	58	120	88
19	100	105	75	55	55	120	170	88	224	68	112	110
20	92	102	70	55	60	*140	182	80	208	*62	95	118
21	86	102	70	55	65	135	191	92	*188	67	88	112
22	80	98	70	50	65	120	170	*130	164	72	80	120
23	78	95	65	55	60	150	170	155	122	72	74	146
24	78	98	65	60	55	173	176	173	98	76	76	155
25	78	98	60	55	60	179	158	167	86	72	84	146
26	84	95	60	65	65	194	138	188	63	72	92	132
27	88	102	65	60	*70	164	128	236	55	72	88	125
28	86	100	70	55	65	140	122	276	62	72	76	128
29	95	88	65	50	-	132	128	312	68	82	72	128
30	86	*98	60	*55	-----	135	128	356	67	92	70	125
31	*78	-----	55	60	-----	128	-----	336	-----	102	70	-----
Total	2,095	2,828	2,322	1,730	1,705	3,195	4,555	4,802	6,561	2,221	2,993	3,154
Mean	67.6	94.3	74.9	55.8	60.9	103	152	155	219	71.6	96.5	105
Ac-ft	4,160	5,610	4,610	3,430	3,380	6,340	9,030	9,520	13,010	4,410	5,940	6,260

Calendar year 1960: Max 600 Min 23 Mean 141 Ac-ft 102,600  
Water year 1960-61: Max 356 Min 41 Mean 105 Ac-ft 75,700

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16, 17, Dec. 4-28, Mar. 22, 23. No gage-height record Dec. 29 to Mar. 20 (stage-discharge relation affected by ice during most of period).

## GUNNISON RIVER BASIN

9-1218. Cebolla Creek near Powderhorn, Colo.

Location.--Lat 38°13'40", long 107°04'20", in NW¼ sec.23, T.46 N., R.2 W., on right bank 50 ft downstream from private bridge, 1.4 miles upstream from Beaver Creek, and 4.5 miles southeast of Powderhorn.

Drainage area.--223 sq mi.

Records available.--April 1960 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 8,281.04 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 275 cfs May 23 (gage height, 2.94 ft); minimum daily, 14 cfs Mar. 28.  
1960-61: Maximum discharge, 380 cfs June 4, 1960 (gage height, 3.19 ft); minimum daily, 14 cfs Mar. 28, 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Small diversions above station for irrigation of hay meadows. Tabor ditch (see elsewhere in this report) diverts water into Clear Creek in the Rio Grande basin.

Rating tables, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 18		June 19 to Sept. 30	
1.9	28	2.0	28
2.1	48	2.2	50
2.3	84	2.4	82
2.8	228		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	36	18	22	28	*20	16	140	155	53	45	51
2	37	*34	*20	22	28	20	18	140	146	53	57	46
3	37	38	22	20	28	22	24	129	121	56	77	57
4	37	36	24	20	30	22	40	126	111	56	64	60
5	*37	36	22	20	28	20	50	*91	106	46	61	60
6	36	36	20	20	26	20	57	71	103	51	56	60
7	35	39	18	22	24	20	51	67	*103	54	51	56
8	35	37	20	24	26	18	45	60	103	53	57	53
9	36	34	20	26	28	18	44	62	111	48	54	60
10	42	28	20	26	28	18	41	94	111	40	54	68
11	44	34	20	*26	28	18	38	113	108	38	58	64
12	39	36	20	26	28	18	38	116	101	36	63	60
13	37	36	18	26	30	18	42	98	101	35	56	57
14	37	32	16	26	30	18	40	76	89	34	53	*56
15	37	28	16	28	28	20	40	65	86	33	49	53
16	42	26	18	28	28	18	51	63	86	34	50	56
17	47	26	18	26	26	18	44	74	82	30	54	53
18	46	28	18	26	24	18	62	82	78	33	*60	53
19	42	28	20	26	24	20	*103	108	82	28	56	60
20	39	30	20	26	24	20	124	129	75	38	51	66
21	38	30	22	26	24	20	86	106	73	*40	61	64
22	38	30	22	26	24	*18	94	152	*64	40	51	64
23	38	30	22	26	22	16	113	208	60	35	48	71
24	39	32	20	28	20	16	113	*164	60	35	49	68
25	39	30	20	30	20	16	65	164	57	36	61	60
26	39	28	20	30	22	16	63	170	51	37	60	57
27	39	28	22	30	20	16	57	155	51	42	50	54
28	39	26	22	28	20	14	89	176	56	42	46	54
29	37	24	20	26	-	16	131	161	56	39	45	54
30	34	20	20	28	-----	16	146	170	61	38	46	54
31	30	-----	20	*28	-----	16	-----	161	-----	38	50	-----
Total	1,186	936	618	792	716	564	1,925	3,691	2,647	1,276	1,693	1,749
Mean	38.3	31.2	19.9	25.5	25.6	18.2	64.2	119	88.2	41.2	54.6	58.3
Ac-ft	2,350	1,860	1,230	1,570	1,420	1,120	3,820	7,320	5,250	2,530	3,360	3,470

Calendar year 1960: Max - Min - Mean - Ac-ft -  
Water year 1960-61: Max 208 Min 14 Mean 48.7 Ac-ft 35,300

Peak discharge (base, 350 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9 to Apr. 5. No gage-height record Oct. 30 to Nov. 2, Nov. 26 to Mar. 22.

## GUNNISON RIVER BASIN

223

9-1225. Soap Creek near Sapinero, Colo.

Location.--Lat 38°33'40", long 107°19'30", in SW¼ sec.29, T.50 N., R.4 W., on right bank 1¼ miles upstream from Cow Creek and 6½ miles north of Sapinero.

Drainage area.--57.3 sq mi.

Records available.--August 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,790 ft (from topographic map).

Average discharge.--6 years, 61.4 cfs (44,450 acre-ft per year).

Extremes.--Maximum discharge during year, 295 cfs May 22 (gage height, 3.05 ft); minimum daily, 2.9 cfs Nov. 1.

1955-61: Maximum discharge, about 1,000 cfs sometime during period June 4-6, 1957; maximum gage height, 6.07 ft June 6, 1957; minimum daily discharge, 2.6 cfs Oct. 23, 1958.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One small diversion for irrigation of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	1.3	2.0	43
1.4	3.3	2.3	94
1.6	11	2.6	165
1.8	23	3.0	280

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.3	2.9	4.4				11	182	226	35	8.6	7.4
2	3.3	3.1	4.0				12	223	217	28	12	6.6
3	*3.7	3.1	4.4				20	232	185	28	12	9.4
4	3.3	3.3	5.2				36	190	160	27	10	9.8
5	3.3	3.7	5.5				33	142	*152	23	9.8	9.4
6	3.3	3.7	5.2			5.5	36	116	155	22	9.0	9.8
7	3.1	4.8	4.4				34	94	162	20	7.8	9.4
8	3.1	5.2	5.5				28	80	165	18	7.0	8.6
9	3.3	4.6	5.9				26	*88	180	17	6.3	9.4
10	4.0	4.0	5.9				21	145	196	16	5.9	13
11	4.8	4.2	5.2				19	220	190	15	7.4	12
12	5.2	4.4	5.9				18	238	182	14	7.8	*10
13	5.2	4.4	5.2				22	220	172	14	7.0	7.8
14	4.8	4.0	4.8				19	152	160	13	6.3	7.0
15	5.2	3.4	4.4				19	126	145	12	6.3	6.3
16	5.5	3.0	4.4	4.5	5	7.5	20	130	128	11	7.8	6.3
17	6.3	3.6	4.8				22	155	116	11	14	8.6
18	7.0	4.0	5.5				40	208	109	11	*11	9.4
19	7.4	4.4	5.2				66	250	98	9.8	9.0	14
20	6.6	5	4.8				86	244	*92	10	7.8	12
21	5.9	5	4.8			10	74	241	84	*11	7.0	14
22	5.5	5	5.2			14	74	*247	74	10	6.6	30
23	4.8	5	4.8			*20	98	256	64	9.4	5.9	42
24	4.8	5	4.4			20	84	250	59	9.0	5.9	38
25	4.8	5	4.4			16	62	250	53	9.0	9.0	26
26	4.4	5.2	4.5			15	51	247	46	9.0	8.2	23
27	4.4	5.2	4.5			13	51	244	41	10	7.0	22
28	4.8	4.4	4.5			13	69	247	35	8.6	5.9	22
29	4.8	3.3	4.5			12	118	250	33	10	5.5	22
30	3.6	*5.2	4.5			11	165	256	39	9.8	6.3	22
31	*3.6	-----	4.5			11	-----	238	-----	9.4	7.0	-----
Total	143.1	127.1	151.2	139.5	140	285.0	1434	6161	3718	460.0	247.1	447.2
Mean	4.62	4.24	4.88	4.5	5	9.20	47.8	199	124	14.8	7.97	14.9
Ac-ft	284	252	300	277	278	565	2,840	12,220	7,370	912	490	887

Calendar year 1960: Max 380 Min 2.9 Mean 47.4 Ac-ft 34,380  
 Water year 1960-61: Max 256 Min 2.9 Mean 36.9 Ac-ft 26,680

Peak discharge (base, 300 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 9-26, Mar. 26, 27, 31, Apr. 6, 9, 11, 12, 15-17. No gage-height record Dec. 26 to Mar. 22.

## GUNNISON RIVER BASIN

9-1245. Lake Fork at Gateview, Colo.

Location.--Lat 38°17'50", long 107°13'50", in sec.29, T.47 N., R.3 W., on left bank at old village of Gateview, 15 ft downstream from private bridge, a quarter of a mile upstream from Indian Creek, and 15 miles upstream from mouth.

Drainage area.--338 sq mi.

Records available.--October 1937 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 7,827.66 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1938, at datum 2.00 ft higher and Oct. 1, 1938, to Sept. 30, 1945, at datum 1.00 ft higher.

Average discharge.--24 years, 247 cfs (178,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,420 cfs May 28 (gage height, 3.10 ft); minimum daily, 30 cfs Jan. 30.  
1937-61: Maximum discharge, 2,700 cfs June 29, 1957 (gage height, 4.30 ft); minimum daily determined, 25 cfs Dec. 5, 1955, Jan. 10, 17, 18, 1957.

Remarks.--Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 1,600 acres above station.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	48	1.5	340
.3	58	2.0	600
.6	96	3.0	1,350
1.0	170		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	66	42	36	34	*40	46	219	1.170	395	159	126
2	68	*64	*44	36	34	38	48	308	1.150	395	182	121
3	68	64	46	34	34	38	55	390	996	355	219	139
4	70	64	46	34	34	38	80	445	769	340	213	143
5	*69	62	44	34	34	38	85	*365	811	324	250	141
6	65	62	40	34	32	38	80	320	876	320	216	148
7	64	68	36	34	32	36	75	228	*948	312	192	144
8	60	66	38	34	32	34	70	192	1.060	304	192	146
9	64	60	40	36	32	36	70	180	1.160	284	192	161
10	76	50	40	36	34	38	65	207	1.190	268	175	180
11	77	50	40	*36	34	38	62	345	1.190	239	168	180
12	74	55	40	34	34	38	60	460	1.080	222	207	168
13	68	60	38	34	34	36	66	455	996	216	204	155
14	69	60	36	34	36	36	60	360	988	207	188	*148
15	66	55	34	36	38	38	56	280	1.010	195	172	144
16	74	45	34	38	38	44	60	253	956	185	172	143
17	83	50	34	36	36	46	62	280	916	170	185	137
18	86	55	36	34	34	48	77	365	884	159	*185	134
19	81	55	38	32	34	48	*92	530	825	157	175	143
20	77	55	38	34	34	50	107	696	839	157	163	155
21	75	55	38	34	34	50	126	588	818	*157	163	161
22	75	55	38	34	34	*50	114	811	*755	150	152	166
23	75	55	40	34	34	50	116	1.010	672	139	143	188
24	74	55	38	34	34	55	117	*1.020	624	134	137	190
25	74	55	38	34	34	50	106	1.080	612	128	148	180
26	72	60	38	38	36	50	95	1.210	546	130	146	175
27	72	55	38	42	38	50	99	1.270	500	132	137	172
28	75	50	36	42	40	50	106	1.300	450	132	132	166
29	72	45	34	34	-	48	121	1.240	380	134	126	166
30	66	40	34	30	-----	48	159	1.210	410	134	125	161
31	65	-----	34	*34	-----	46	-----	1.130	-----	134	126	-----
Total	2,219	1,691	1,190	1,086	968	1,343	2,535	18,747	25,581	6,708	5,344	4,681
Mean	71.6	56.4	38.4	35.0	34.6	43.3	84.5	605	853	216	172	156
Ac-ft	4,400	3,350	2,360	2,150	1,920	2,660	5,030	37,180	50,740	13,310	10,600	9,280

Calendar year 1960: Max 1,580 Min 30 Mean 228 Ac-ft 165,200

Water year 1960-61: Max 1,300 Min 30 Mean 198 Ac-ft 143,000

Peak discharge (base, 1,400 cfs)--May 28 (1 a.m.) 1,420 cfs (3.10 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9 to Apr. 10 (no gage-height record Dec. 2 to Mar. 22).



9-1250. Curecanti Creek near Sapinero, Colo.

Location (revised).--Lat 38°29'15", long 107°24'55", in sec.21, T.49 N., R.5 W., on downstream side of left pier of bridge on State Highway 92, 2½ miles upstream from mouth and 6 miles west of Sapinero.

Drainage area.--31.8 sq mi.

Records available.--October 1945 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 7,867.43 ft (revised) above mean sea level, datum of 1929. Prior to Oct. 1, 1947, at site 65 ft upstream at datum 3.00 ft higher. Oct. 1, 1947, to Sept. 17, 1952, at site 65 ft upstream at datum 1.00 ft higher.

Average discharge.--16 years, 33.3 cfs (24,110 acre-ft per year).

Extremes.--Maximum discharge during year, 163 cfs May 28 (gage height, 3.52 ft); minimum daily, 2.2 cfs Aug. 14, 15.

1945-61: Maximum discharge, 480 cfs June 5, 1957; maximum gage height, 4.30 ft June 28, 1957; minimum daily discharge, 2.0 cfs Aug. 1-3, 1948, but may have been less during periods of ice effect.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One diversion above station for irrigation in Smith Fork drainage.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used July 29 to Sept. 2, Sept. 23-30)

2.0	1.5	2.3	7.5	2.6	21
2.1	3.0	2.4	11	3.0	63
2.2	5.0	2.5	15	3.5	160

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0					(*)	7.0	88	133	14	4.4	5.2
2	3.0		(*)				7.8	101	125	12	4.4	4.0
3	*3.2						14	*105	109	11	8.9	6.0
4	3.4						21	93	93	11	7.2	6.5
5	3.4						21	72	*88	9.2	6.8	6.2
6	3.4					3.0	20	59	88	8.9	4.6	7.2
7	3.2						20	50	93	8.2	3.8	5.8
8	3.2						17	44	93	7.8	3.2	5.0
9	3.2						14	46	101	7.0	*3.0	5.2
10	3.6						11	62	109	6.5	3.0	13
11	3.4			(*)			11	88	105	6.0	3.0	8.2
12	3.8						11	107	95	6.5	4.8	*6.2
13	3.6						12	99	88	6.0	3.0	5.2
14	3.6						11	74	80	5.8	2.2	4.8
15	3.8						12	62	74	5.8	2.2	4.4
16	4.0	3.4	3.2	3.0	3.2		11	62	68	5.5	3.6	4.2
17	5.0						12	74	62	4.8	7.2	4.0
18	5.2					7	21	99	56	4.8	4.6	4.8
19	5.2						*34	119	51	*4.4	4.2	8.9
20	4.6						47	125	*47	5.0	2.8	7.0
21	4.2						46	119	41	5.2	2.7	6.5
22	4.0						43	*133	36	5.0	2.7	14
23	3.8						52	138	31	4.6	2.6	20
24	3.6					*12	48	135	26	4.2	2.7	18
25	3.4					12	37	142	24	4.8	5.8	13
26	3.4					11	28	145	19	5.2	5.8	13
27	3.4					11	26	140	17	5.5	4.2	13
28	b3.2					9.2	35	143	16	5.0	3.4	13
29	b3.2					7.8	56	145	15	5.2	3.0	13
30	b3.2					7.0	76	145	14	7.2	3.6	13
31	*3.4					6.8	-----	138	-----	5.2	5.0	-----
Total	113.6	102.0	99.2	93.0	89.6	189.8	781.8	3157	1997	207.3	128.4	258.3
Mean	3.66	3.4	3.2	3.0	3.2	6.12	26.1	102	66.6	6.69	4.14	8.61
Ac-ft	225	202	197	184	178	376	1,550	6,260	3,960	411	255	512

Calendar year 1960: Max 214 Min 2.6 Mean 30.2 Ac-ft 21,890

Water year 1960-61: Max 148 Min 2.2 Mean 19.8 Ac-ft 14,310

Peak discharge (base, 250 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 1-3, Oct. 31 to Mar. 24 (stage-discharge relation affected by ice during most of period).

## GUNNISON RIVER BASIN

9-1260. Cimarron Creek near Cimarron, Colo.

Location.--Lat 38°15'30", long 107°32'40", in sec.8, T.46 N., R.6 W., on right bank 0.2 mile downstream from highway bridge, 0.5 mile upstream from headgate on Cimarron ditch, 2.5 miles downstream from West Fork, and 13 miles south of Cimarron.

Drainage area.--66.8 sq mi.

Records available.--October 1954 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,650 ft (from topographic map).

Average discharge.--7 years, 89.8 cfs (65,010 acre-ft per year).

Extremes.--Maximum discharge during year, 705 cfs May 31 (gage height, 6.07 ft); minimum daily, 10 cfs Nov. 16.

1954-61: Maximum discharge, 1,790 cfs June 28, 1957 (gage height, 8.32 ft); minimum daily determined, 10 cfs Mar. 13, 1957, Feb. 9, Nov. 16, 1960.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversion above station through Owl Creek ditch into Uncompahgre River basin. Diversion below station by Cimarron ditch for water year 1961 is given below.

Month	Diversion in acre-feet	Month	Diversion in acre-feet
October.....	924	April.....	0
November.....	357	May.....	2,690
December.....	0	June.....	8,360
		July.....	2,960
Calendar year 1960....	19,540	August.....	2,990
		September.....	2,540
January.....	0		
February.....	0	Water year 1960-61....	20,820
March.....	0		

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.4	8.0	4.1	65	5.0	260
3.6	17	4.5	140	5.7	530
3.8	30				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	16	16	14	13	13	13	162	522	146	71	49
2	15	15	15	14	13	13	13	185	490	126	88	40
3	*16	16	16	14	13	13	15	182	374	122	106	51
4	17	16	15	14	13	12	18	164	306	122	72	50
5	18	16	14	14	13	12	20	130	310	108	65	61
6	16	16	14	14	13	12	21	98	326	106	59	57
7	15	19	15	14	13	11	21	78	370	96	49	51
8	14	17	15	14	13	11	18	71	*410	92	43	50
9	15	14	15	14	13	11	18	*84	426	84	39	58
10	16	14	15	14	13	11	16	136	434	77	38	57
11	18	15	16	14	13	11	15	185	418	72	54	48
12	16	15	16	14	13	12	15	222	394	70	97	*43
13	16	15	16	14	13	13	15	198	370	65	50	39
14	16	14	16	14	13	14	15	150	370	61	43	38
15	16	12	16	14	13	15	17	130	366	58	43	37
16	16	10	16	14	14	16	20	128	330	55	*70	39
17	17	12	17	14	12	15	*23	148	310	52	65	35
18	19	13	17	14	12	13	37	200	275	49	52	47
19	18	14	16	14	14	12	55	284	275	*44	54	54
20	16	14	16	14	14	12	74	306	275	48	48	61
21	16	15	16	14	14	11	61	314	260	46	58	58
22	16	15	16	14	14	13	65	438	*242	39	48	74
23	15	15	15	14	14	14	71	426	222	35	43	104
24	15	16	14	14	14	14	59	*410	215	33	44	82
25	15	15	14	14	14	14	43	442	198	34	76	72
26	16	16	14	14	14	13	35	462	182	32	54	72
27	16	15	15	14	14	13	36	450	164	31	44	71
28	18	15	14	14	13	13	57	482	146	29	41	76
29	15	14	14	14	-	13	94	502	142	29	38	71
30	13	*16	14	14	-----	13	134	502	160	30	42	57
31	*14	-----	14	13	-----	13	-----	514	-----	45	49	-----
Total	493	445	472	433	372	396	1,114	8,183	9,282	2,036	1,743	1,702
Mean	15.9	14.8	15.2	14.0	13.3	12.8	37.1	264	309	65.7	56.2	56.7
Ac-ft	978	883	936	859	738	785	2,210	16,230	18,410	4,040	3,460	3,380

Calendar year 1960: Max 544 Min 10 Mean 72.7 Ac-ft 52,740

Water year 1960-61: Max 522 Min 10 Mean 73.1 Ac-ft 52,910

Peak discharge (base, 400 cfs).--May 31 (8:30 p.m.) 705 cfs (6.07 ft); June 8 (8:30 p.m.) 602 cfs (5.84 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29-31, Nov. 2, Nov. 9 to Dec. 10, Mar. 14, 15, 18, 19, 21-29, 31, Apr. 2-6, 12-16.

9-1275. Crystal Creek near Maher, Colo.

Location---Lat 38°33', long 107°30', in SW $\frac{1}{4}$  sec.35, T.50 N., R.6 W., on left bank 600 ft downstream from private bridge, half a mile upstream from diversion to Iron Creek basin, 1 mile downstream from North Fork, 7 miles upstream from mouth, and 7 miles southeast of Maher. Prior to Oct. 1, 1960, at site 140 ft upstream.

Drainage area---39.1 sq mi.

Records available---October 1916 to September 1919, July 1945 to September 1954, October 1960 to September 1961.

Gage---Water-stage recorder. Altitude of gage is 8,050 ft (by barometer). Prior to Sept. 30, 1919, staff gage at bridge a quarter of a mile downstream at different datum. July 6, 1945, to Sept. 30, 1954, at site 140 ft upstream at datum 1.45 ft higher.

Average discharge---13 years, 29.3 cfs (21,210 acre-ft per year).

Extremes---Maximum discharge during year, 187 cfs May 19 (gage height, 2.59 ft); minimum daily, 2.6 cfs Aug. 14.

1916-19, 1945-54, 1960-61: Maximum discharge, 542 cfs Apr. 29, 1948 (gage height, 5.05 ft, site and datum then in use), from rating curve extended above 200 cfs; no flow at times during August 1918.

Remarks---Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of a few acres of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	1.5	1.4	16
1.0	3.0	1.6	29
1.1	5.0	1.9	61
1.2	8.0	2.4	145

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	5				4.6	8	103	93	16	3.8	6.5
2	4.6	5.5	(*)		(*)	4.6	9	119	84	14	4.4	4.6
3	4.8	*5.9				4.6	11	117	67	13	10	7.1
4	5.0	6.2				4.6	13	101	55	12	5.6	8.4
5	5.3	6.2		(*)		4.6	13	81	*53	12	5.6	8.8
6	*5.0	6.2				4.4	12	65	53	10	4.6	9.6
7	5.0	6				4.4	11	56	56	10	3.8	6.5
8	5.0	6				*4.6	10	51	56	9.6	3.2	5.3
9	5.6	5				4.8	11	55	61	8.0	*3.0	6.5
10	5.9	6				5	10	78	65	7.7	3.0	21
11	6.2	6.5				5	11	114	65	7.4	3.2	9.6
12	6.2	6.5				5	11	*135	65	6.8	3.2	6.5
13	5.9	6.5				5.5	11	114	60	6.8	2.8	5.6
14	6.2	6				5.5	10	75	60	6.5	2.6	5.3
15	6.5	6				6	11	60	55	6.5	3.0	5.0
16	5.9	6	5	4.5	4.5	6	13	57	50	5.6	7.4	5.0
17	6.8	6.5				5.5	15	74	48	*5.3	10	5.0
18	6.8	7				5	26	110	44	5.0	5.6	6.8
19	6.5	6.5				5	37	143	40	4.6	4.6	10
20	6.5	6				5	50	133	*36	4.8	4.0	10
21	6.2	6.5				5	49	121	36	4.8	3.8	9.2
22	6.2	6.5				5.5	54	*141	34	4.6	3.4	15
23	6.2	6.5				6	62	141	30	4.0	3.2	24
24	6.2	6.5				6.5	53	131	27	3.6	3.8	22
25	5.9	6.5				5.5	*39	133	24	3.6	8.0	18
26	5.9	6.5				5	33	123	21	3.6	6.5	*20
27	5.9	5				5	33	110	20	3.8	4.4	19
28	6	5				5	44	114	19	3.6	3.6	17
29	5.5	5				5	68	*108	17	3.6	*3.4	15
30	4.2	5				*6	90	104	17	3.8	4.6	13
31	4.2	-----				7	-----	101	-----	3.8	6.2	-----
Total	176.5	180.5	155	139.5	126.0	161.2	828	3168	1411	214.4	144.3	325.3
Mean	5.69	6.02	5	4.5	4.5	5.20	27.6	102	47.0	6.92	4.65	10.8
Ac-ft	350	358	307	277	250	320	1,640	6,280	2,800	425	286	645

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 143 Min 2.6 Mean 19.3 Ac-ft 13,940

Peak discharge (base, 160 cfs)---May 19 (7 p.m.) 187 cfs (2.59 ft).

\* Discharge measurement made on this day.

Note---Stage-discharge relation affected by ice Oct. 28 to Nov. 2, Nov. 7 to Apr. 17. No gage-height record Nov. 29 to Mar. 8, June 10-20.

## GUNNISON RIVER BASIN

9-1280. Gunnison River below Gunnison tunnel, Colo.

Location.--Lat 38°32', long 107°39', in NW 1/4 sec.10, T.49 N., R.7 W., on left bank a quarter of a mile downstream from east portal of Gunnison tunnel, 5 miles downstream from Crystal Creek, and 12 miles northeast of Montrose.

Drainage area.--3,980 sq mi, approximately.

Records available.--October 1903 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "at east portal of Gunnison tunnel" 1905-6 and as "at River Portal" 1907-11.

Gage.--Water-stage recorder. Datum of gage is 6,526.06 ft above mean sea level, datum of 1929. Apr. 9, 1905, to Aug. 20, 1915, staff gage at site 300 ft upstream from diversion dam at east portal of Gunnison tunnel at different datum. Aug. 21, 1915, to Jan. 19, 1943, staff gage at site 500 ft downstream from diversion dam at east portal of Gunnison tunnel at different datum. Jan. 20, 1943, to Sept. 30, 1956, water-stage recorder at same site at datum 1.0 ft higher.

Average discharge.--58 years, 1,476 cfs, unadjusted (1,069,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,280 cfs May 29 (gage height, 7.00 ft); minimum daily, 8.0 cfs Oct. 14.

1903-61: Maximum discharge observed, 19,000 cfs June 15, 1921 (gage height, about 15.8 ft, present datum), from rating curve extended above 14,000 cfs; no flow Sept. 25, 26, 1936, Oct. 8, 1949, Sept. 5, 6, 15, 16, 1950.

Remarks.--Records good except those for period of ice effect, which are poor. Natural flow of stream affected by transbasin diversions (see below), Taylor Park Reservoir (see elsewhere in this report), diversions for irrigation of about 63,000 acres, and return flow from irrigated areas. Record of diversion through Gunnison tunnel for irrigation in Uncompahgre Valley during the water year 1961 is given below:

Month	Diversion in acre-feet	Month	Diversion in acre-feet
October.....	32,380	April.....	26,500
November.....	5,710	May.....	52,710
December.....	0	June.....	52,590
		July.....	58,130
Calendar year 1960....	325,600	August.....	57,240
		September.....	40,310
January.....	0		
February.....	0	Water year 1960-61....	326,700
March.....	1,140		

Cooperation.--Record of diversion through Gunnison tunnel furnished by Uncompahgre Valley Water Users Association.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.1	4.0	0.5	30	1.5	240	4.0	1,500
.2	9.0	.7	50	2.0	420	6.0	3,190
.3	15	1.0	98	3.0	880	7.0	4,250

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	264	464	320	360	320	624	1,190	3,950	258	352	130
2	28	*300	440	310	360	330	632	1,610	3,820	236	328	113
3	21	303	480	310	360	350	685	1,840	3,230	219	348	275
4	14	338	450	310	350	360	740	1,780	2,560	272	331	331
5	21	300	400	320	330	350	874	1,370	2,290	261	296	275
6	*28	268	360	340	310	350	766	964	2,240	282	190	184
7	21	296	*350	360	310	350	624	766	2,390	492	148	109
8	21	331	370	370	310	330	528	612	*2,510	564	*190	54
9	28	310	420	370	310	320	392	432	2,880	428	205	33
10	28	244	440	370	320	330	370	*532	3,170	314	208	70
11	21	216	430	370	340	340	300	1,050	3,470	163	261	102
12	28	412	420	360	350	360	184	1,680	3,610	116	342	66
13	48	544	400	330	360	380	178	1,830	2,660	90	338	41
14	8.0	560	380	320	370	430	184	1,350	2,530	71	278	41
15	21	568	350	320	370	490	128	928	2,390	128	244	*26
16	21	448	320	330	370	560	116	782	2,230	202	268	53
17	21	396	320	340	360	640	128	808	2,040	169	342	53
18	118	520	350	330	360	*760	166	1,050	1,940	208	199	41
19	163	548	370	*320	350	740	268	1,580	1,700	*254	166	79
20	125	560	390	310	340	720	*604	2,160	1,560	247	102	190
21	94	544	400	300	340	660	644	2,100	1,400	151	34	181
22	113	536	400	310	340	640	528	2,540	1,240	178	26	250
23	100	512	400	310	340	720	604	3,180	*970	109	55	615
24	173	488	400	310	330	760	640	3,340	820	77	120	640
25	230	520	400	310	320	720	428	*3,320	725	69	275	548
26	230	548	400	320	330	680	184	3,770	516	111	338	448
27	230	576	420	350	340	640	140	3,930	416	212	216	396
28	274	556	430	350	330	450	128	4,150	264	289	130	376
29	290	380	420	320	-	356	338	4,060	157	331	138	396
30	275	380	380	330	-----	392	720	4,080	208	334	130	388
31	244	-----	350	350	-----	540	-----	3,980	-----	356	163	-----
Total	3,065.0	1,276.6	1,230.4	1,027.0	956.0	1,536.8	1,284.5	6,276.4	5,988.6	7,191	6,761	6,505
Mean	98.9	426	397	331	341	496	428	2,025	1,996	232	218	217
Ac-ft	6,080	25,320	24,400	20,370	18,960	30,480	25,480	124,500	118,800	14,260	13,410	12,900

Calendar year 1960: Max 5,820 Min 8.0 Mean 976 Ac-ft 708,800

Water year 1960-61: Max 4,150 Min 8.0 Mean 601 Ac-ft 435,000

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 4 to Mar. 28. Discharge computed from once-daily staff-gage readings Oct. 1-17, Aug. 21-23, Sept. 8, 9, 12-19.



9-1285. Smith Fork near Crawford, Colo.

Location.--Lat 38°44', long 107°31', in sec.24, T.15 S., R.91 W., on left bank 20 ft upstream from county bridge, 0.4 mile upstream from Second Creek, 6 miles northeast of Crawford, and 6½ miles upstream from Iron Creek.

Drainage area.--42 sq mi, approximately.

Records available.--October 1935 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 7,200 ft (by barometer). Prior to Nov. 16, 1938, staff gage at same site and datum.

Average discharge.--26 years, 42.9 cfs (31,060 acre-ft per year).

Extremes.--Maximum discharge during year, 209 cfs May 23 (gage height, 4.27 ft); minimum daily, 4.6 cfs Jan. 2, 3, Feb. 20.

1935-61: Maximum discharge, about 1,050 cfs June 6, 1957; maximum gage height, 5.56 ft June 8, 1957; minimum discharge not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of a few acres of hay meadows above station. Saddle Mountain ditch diverts water above station for irrigation of about 800 acres below. One small ditch diverts from Virginia Creek to Iron Creek drainage, and Head and Ferrier ditch diverts water from Curecanti Creek drainage.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 29 to Sept. 30)

2.6	3.0	3.4	4.5
2.8	7.5	3.7	85
2.9	11	4.2	200
3.1	20		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	6.8	6.8	5	5.5	5	8.6	109	117	29	8.2	11
2	6.0	7.0	*6.8	4.6	*5.5	5.0	10	135	105	26	16	11
3	6.2	*7.2	6.8	4.6	5.8	5.5	15	*152	85	28	16	13
4	6.2	7.2	6.5	4.8	5.8	5.5	24	142	73	28	12	13
5	6.2	7.2	6	*6.0	5.5	5.8	25	115	*73	26	11	12
6	*6.2	7.2	5.5	5.8	5	5.2	21	93	79	26	10	*12
7	6.0	9.2	5	6.2	5	5.5	21	78	79	24	8.9	11
8	6.0	9.2	5	6.5	5	*6	18	69	78	22	8.2	11
9	6.8	7.5	6.2	6.0	5.2	6	14	72	78	20	*8.2	13
10	7.0	6	6.0	5.8	5.2	6	13	109	74	19	7.5	24
11	8.6	6.5	5.5	5.8	5.2	5.5	11	150	70	18	7.5	18
12	7.5	6.5	5	6.0	5.2	6	12	*170	64	18	7.8	15
13	7.5	6.5	5	6.2	5.5	6	14	150	57	16	7.2	9.2
14	7.5	6.8	5	6.5	5.5	7	13	115	61	16	7.0	12
15	7.8	6.2	5	6.0	5.5	11	12	93	66	14	7.0	12
16	7.5	5	5	5.8	5.8	12	11	87	65	13	9.6	11
17	7.2	6	5.5	5.8	5.5	13	17	101	62	*13	13	11
18	7.5	6.5	5.8	6.2	5	11	33	132	60	12	11	15
19	8.6	6.5	5.5	6	5	10	44	162	60	12	10	18
20	7.8	6.5	5	6	4.6	10	56	185	*57	11	8.9	18
21	7.8	6	5	5.5	5	10	50	172	55	12	8.2	20
22	7.5	6	5.8	5.5	5.5	9.5	47	*190	51	11	7.8	33
23	7.2	6.8	5.5	5.5	5.5	13	58	192	46	10	7.5	56
24	7.8	6.5	5.5	5.5	5	15	53	175	44	9.6	7.5	55
25	7.5	6.5	5.5	6	5	14	*42	178	40	9.6	13	43
26	7.5	6.5	5.5	6	5.2	11	35	175	36	8.6	12	*36
27	7.2	6.8	6	5.5	5	10	34	155	33	8.9	9.2	33
28	7.8	6	5.5	5.5	5	9.2	46	155	31	8.2	8.2	30
29	8.2	5.5	5	5	-	8.2	70	*152	30	8.6	7.8	29
30	6.8	6.5	5	5	-----	*7.8	95	145	30	8.9	9.6	27
31	6.2	-----	5	5.5	-----	7.8	-----	138	-----	8.6	11	-----
Total	221.6	200.6	173.2	176.1	147.5	262.5	922.6	4,246	1,859	495.0	296.8	632.2
Mean	7.15	6.69	5.59	5.68	5.27	8.47	30.8	137	62.0	16.0	9.57	21.1
Ac-ft	440	398	344	349	293	521	1,830	8,420	3,690	982	589	1,250

Calendar year 1960: Max 254 Min 4.6 Mean 33.6 Ac-ft 24,360

Water year 1960-61: Max 192 Min 4.6 Mean 26.4 Ac-ft 19,110

Peak discharge (base, 260 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10-13, 16-22, 28-30, Dec. 4-8, 11-17, 20, 21, Dec. 23 to Jan. 4, Feb. 5-8, 15, 18-25, Feb. 27 to Mar. 1, Mar. 7-14, 18, 19, 22, Apr. 6, 9, 11, 12, 15, 16. No gage-height record Jan. 19 to Feb. 2.

## GUNNISON RIVER BASIN

9-1306. West Muddy Creek near Ragged Mountain, Colo.

Location--Lat 39°08', long 107°35', in NW¼ sec.5, T.11 S., R.91 W., on left bank 100 ft upstream from Gold Creek and 9½ miles northwest of Ragged Mountain.

Drainage area--6.88 sq mi.

Records available--October 1955 to September 1961.

Gage--Water-stage recorder.

Average discharge--6 years, 4.39 cfs (3,180 acre-ft per year).

Extremes--Maximum discharge during year, 88 cfs May 10 (gage height, 4.33 ft); maximum gage height, 5.16 ft Apr. 20 (backwater from ice); minimum daily discharge, 0.2 cfs for many days.  
1955-61: Maximum discharge, 170 cfs May 30, 1957 (gage height, 5.27 ft); maximum gage height, 5.5 ft (from floodmark, ice Jan) sometime during period Apr. 21-23, 1958; no flow at times in 1956, 1959-60.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 29 to Sept. 7)

2.0	0.2	2.4	1.3	2.8	8.4
2.2	.4	2.5	2.4	3.0	14
2.3	.7	2.6	3.9	3.6	40

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.3						18	13	2.0	2.7	0.4
2	.2	.3						30	12	1.4	2.2	.5
3	.2	.3						33	10	1.2	2.0	1.1
4	.2	.3						21	8.9	1.2	1.2	1.2
5	.2	.3						12	8.9	1.2	2.0	2.1
6	.2							9	9.2	1.1	.9	2.8
7	.2						0.8	7	8.7	1.2	.6	1.8
8	.2							9	8.4	1.2	.7	1.2
9	.3							15	8.2	1.0	.6	2.1
10	*.5							33	7.9	1.1	*.4	1.6
11	.7							36	7.7	.9	.5	.9
12	.5							31	7.2	.9	1.4	.6
13	.4						(*)	22	*6.5	.8	1.0	.5
14	.5						.6	17	5.4	.8	.6	.4
15	.5						.3	15	5.0	.8	.4	.4
16	.6		0.3	0.3	0.4	0.6		.4	16	4.3	.7	.8
17	.6							.6	17	4.1	.8	.5
18	.6	.3						2.0	*19	3.6	.4	1.0
19	.6							3.4	21	3.4	.3	2.7
20	.5						10	20	2.8	*.3	.4	1.6
21	.5						8	18	2.7	.3	.5	2.4
22	.4						9	19	2.3	.2	.3	5.4
23	.4						9	20	2.1	.2	.3	6.5
24	.3						7	18	2.0	.2	.2	5.4
25	.3						8	15	1.8	.2	1.3	5.0
26	.3						7	16	*1.5	.2	.7	3.8
27	*.3						6	17	1.5	.6	.4	*3.2
28	.2						7	17	1.4	1.0	.3	2.7
29	.3						9	*17	1.3	1.0	.2	3.0
30	.2	(*)					12	17	1.8	.8	*.4	3.0
31	.2							16		.9	.7	
Total	11.3	9.0	9.3	9.3	11.2	18.6	109.7	596	163.6	24.9	27.5	64.6
Mean	0.36	0.30	0.3	0.3	0.4	0.6	3.66	19.2	5.45	0.80	0.89	2.15
Ac-ft	22	18	18	18	22	37	218	1,180	324	49	55	128

Calendar year 1960: Max 32 Min 0 Mean 3.23 Ac-ft 2,550  
Water year 1960-61: Max 38 Min 0.2 Mean 2.89 Ac-ft 2,090

Peak discharge (base, 40 cfs)--May 3 (6 p.m.) 54 cfs (3.85 ft); May 10 (6:30 p.m.) 88 cfs (4.33 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29 to Nov. 4, Nov. 6 to May 1, May 6-9. No gage-height record Oct. 1-10, Nov. 16 to Apr. 13.

9-1325. North Fork Gunnison River near Somerset, Colo.

Location.--Lat 38°55'45", long 107°26'55" (corrected), in sec.9, T.13 S., R.90 W., on right bank  $1\frac{1}{4}$  mile east of Somerset and 4 miles upstream from Hubbard Creek.

Drainage area.--521 sq mi.

Records available.--October 1933 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,038.6 ft above mean sea level, datum of 1929.

Average discharge.--28 years, 432 cfs (312,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,320 cfs May 23 (gage height, 3.58 ft); minimum daily, 36 cfs Jan. 28, 29.  
1933-61: Maximum discharge, 7,860 cfs June 4, 1957 (gage height, 6.14 ft); minimum daily, 17 cfs Nov. 10, 1950.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by small diversions for irrigation in nearby drainage areas, irrigation of about 3,000 acres above station, and storage in Overland Reservoir (capacity, 2,660 acre-ft).

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-14, Mar. 19 to Apr. 9, Sept. 24-30)

Oct. 1 to Jan. 12

Jan. 13 to Sept. 30

0.1	38	0.3	37	2.0	670
.3	60	.6	80	2.5	1,050
.6	110	.9	155	3.0	1,550
		1.5	390	3.4	2,050

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	61	65	50	g 41	44	110	910	1,550	232	96	90
2	52	59	65	45	*g 42	47	115	1,230	1,410	210	*102	88
3	54	*60	65	40	g 42	49	134	*1,380	1,110	199	110	100
4	54	60	60	40	40	44	264	1,290	970	188	100	110
5	54	59	55	*40	40	46	280	980	934	185	92	112
6	*54	59	55	40	g 41	50	264	758	*942	173	90	118
7	53	65	55	45	g 42	44	284	700	970	170	82	115
8	52	65	*55	45	g 41	*40	252	646	1,010	155	*78	122
9	54	55	60	50	g 42	46	216	694	1,110	146	78	146
10	60	50	60	45	g 46	48	228	1,000	1,170	152	77	202
11	68	55	60	45	g 45	53	216	1,490	1,070	140	76	164
12	64	60	60	40	46	50	232	*1,710	1,000	146	76	140
13	60	60	60	*40	g 47	47	280	1,530	918	134	74	125
14	60	60	55	40	g 47	54	256	1,090	918	134	72	120
15	69	50	50	45	g 46	74	220	926	765	128	70	112
16	65	45	45	g 44	g 50	100	228	960	737	112	77	128
17	63	55	45	g 45	g 50	130	272	1,110	700	*108	98	152
18	65	60	50	g 42	46	140	386	1,340	634	100	88	155
19	68	65	50	g 42	46	137	430	1,700	610	100	88	213
20	65	65	45	g 44	g 46	115	495	1,830	574	102	80	210
21	64	60	45	40	g 44	102	456	1,670	*534	118	77	232
22	61	60	50	40	g 45	98	430	1,950	490	112	74	350
23	60	60	50	g 38	*g 50	115	522	1,980	435	100	72	405
24	60	60	55	g 37	44	161	462	*1,820	381	96	71	390
25	60	60	55	g 41	46	149	*354	1,830	354	92	92	304
26	59	60	55	g 37	47	102	300	1,840	318	125	131	*284
27	58	60	55	g 38	42	92	276	1,730	292	96	118	284
28	61	55	55	36	46	88	376	1,820	276	82	110	296
29	65	40	50	36	-	86	562	1,740	256	90	*102	314
30	56	65	50	g 38	-----	*94	758	1,730	252	86	98	300
31	54	-----	50	g 38	-----	102	-----	1,660	-----	86	86	-----
Total	1,845	1,748	1,685	1,286	1,250	2,547	9,658	43,044	22,690	4,097	2,735	5,881
Mean	59.5	58.3	54.4	41.5	44.6	82.2	322	1,389	756	132	88.2	196
Ac-ft	3,660	3,470	3,340	2,550	2,480	5,050	19,160	85,380	45,000	8,130	5,420	11,660

Calendar year 1960: Max 2,820 Min 40 Mean 342 Ac-ft 248,200

Water year 1960-61: Max 1,980 Min 36 Mean 270 Ac-ft 195,300

Peak discharge (base, 2,400 cfs).--No peak above base.

\* Discharge measurement made on this day.

g Computed from once-daily staff-gage readings.

Note.--Stage-discharge relation affected by ice Nov. 7 to Dec. 23, Feb. 24, 25, 27, Mar. 1, 8-10, 14-18. No gage-height record Dec. 24 to Jan. 15, Jan. 21, 22, 28, 29, Feb. 4, 5, 12, 18, 19.

## GUNNISON RIVER BASIN

9-1327. Hubbard Creek near Paonia, Colo.

Location--Lat 39°03'25", long 107°37'40", in NE $\frac{1}{4}$  sec.35, T.11 S., R.92 W., on left bank 100 ft upstream from Overland ditch crossing, 2 miles southwest of Hubbard Park, and 13 miles north of Paonia.

Drainage area--1.24 sq mi.

Records available--October 1960 to September 1961.

Gage--Water-stage recorder. Altitude of gage is 9,710 ft (from topographic map).

Extremes--Maximum discharge observed, 15 cfs June 1 (gage height, 3.13 ft), discharge measurement; minimum daily discharge, 0.1 cfs Oct. 1-8.

Remarks--Records good except those for period of no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	0.1	2.5	0.4	2.8	3.0
2.3	.2	2.6	.9	3.0	8.4
2.4	.3	2.7	1.7	3.1	13

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1							1.0	* 1.0	1.0	0.9	0.4
2	.1							1.4	8.9	.9	.7	.4
3	.1							1.6	7.5	.8	.4	.4
4	.1							1.1	6.0	.6	.4	.4
5	.1							.9	6.0	.5	.3	.9
6	.1							.8	6.9	*.4	.3	1.4
7	.1							.8	6.9	.6	.3	1.5
8	.1						0.2	.7	6.9	.5	.2	1.7
9	.2							.7	8.4	.4	.2	1.5
10	.4							.8	8.9	.4	*.2	1.1
11	.6							1.4	9.3	.4	.2	.5
12	.4							1.8	8.4	.3	.2	.4
13	.4						(**)	1.6	7.8	.3	.2	.3
14	.4							1.0	* 6.3	.3	.3	.3
15	.3							1.1	6.0	.3	.2	.3
16	.3	0.3	0.2	0.2	0.2	0.2		1.9	5.2	.3	.4	.3
17	.3							3	4.9	.3	.4	.3
18	.3							4	4.7	.3	.3	.9
19	.4							6.5	4.4	.3	.2	1.4
20	.5							5.5	4.0	.3	.3	.8
21	.5						.3	5	3.0	.3	.2	1.1
22	.5							5.5	2.6	.3	.2	3.7
23	.6							6.5	2.1	.3	.2	1.8
24	.6							6.5	1.7	.3	.2	1.6
25	.6							6.5	1.5	.3	.4	2.4
26	.5							.4	8	1.1	.2	1.2
27	*.5							.4	9	1.1	.2	1.4
28	.5							.4	10	1.1	.3	* 2.0
29	.4							.5	9	.8	.3	2.4
30	.3							.6	11	1.0	1.3	*.3 2.0
31	.3							11		1.8	.4	
Total	10.6	9.0	6.2	6.2	5.6	6.2	8.3	125.6	153.4	14.8	9.6	33.8
Mean	0.34	0.3	0.2	0.2	0.2	0.2	0.28	4.05	5.11	0.48	0.31	1.13
Ac-ft	21	18	12	12	11	12	16	249	304	29	19	67

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 11 Min 0.1 Mean 1.07 Ac-ft 770

Peak discharge (base, 20 cfs)--No peak above base.

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--No gage-height record Oct. 3 to June 1 (stage-discharge relation affected by ice during most of period).



9-1328. Middle Hubbard Creek near Paonia, Colo.

Location.--Lat 39°02'55", long 107°37'10", in SW $\frac{1}{4}$  sec.36, T.11 S., R.92 W., on left bank 100 ft upstream from Overland ditch crossing, 2 miles southwest of Hubbard Park, and 12 miles north of Paonia.

Drainage area.--1.65 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,650 ft (from topographic map).

Extremes.--Maximum discharge during year, 19 cfs May 29 (gage height, 3.83 ft); minimum daily determined, 0.2 cfs for many days.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.8	0.1	3.2	2.0
2.9	.3	3.3	3.1
3.0	.7	3.5	6.8
3.1	1.2	3.7	14

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2							1.5	*10	1.4	0.6	0.4
2	.2							2.0	8.7	1.0	.7	.3
3	.2							2.5	7.4	.8	.6	.4
4	.2							2.0	6.6	.7	.5	.4
5	.2							1.7	6.8	.6	.5	.8
6	.2							1.0	6.8	*.5	.4	1.4
7	.2							1.0	7.1	.7	.4	1.1
8	.2							1.0	7.1	.7	.4	.9
9	.2						0.3	1.0	9.7	.5	.4	1.7
10	.4							1.4	10	.4	*.3	1.2
11	.6							*1.6	10	.4	.3	.6
12	.4							2.5	9.0	.4	.3	.4
13	.4						(**)	2.0	8.1	.4	.3	.4
14	.4							1.4	*6.6	.4	.3	.3
15	.3							1.6	5.4	.3	.3	.3
16	.3	0.4	0.4	0.3	0.3	0.3		2.7	4.8	.3	.5	.3
17	.3							3.8	4.6	.3	.5	.3
18	.4							5.6	4.5	.3	.3	1.2
19	.3							6.8	4.3	.3	.3	1.8
20	.3							.5	5.6	4.3	.3	1.0
21	.3							.5	5.2	3.6	.4	1.0
22	.4							.5	6.6	3.1	.4	3.1
23	.4							.6	6.8	2.7	.3	2.2
24	.4							.6	6.8	2.2	.3	2.1
25	.4							.6	6.6	1.9	.3	1.7
26	.5							.7	9.0	1.6	.3	1.6
27	*.4							.7	11	1.4	.3	1.8
28	.4							.7	9.0	1.2	.3	*2.2
29	.4							.7	11	1.0	.3	2.3
30	.4							1.0	11	1.2	.5	1.8
31	.4							*11	-----	.6	.3	-----
Total	10.3	12.0	12.4	9.3	8.4	9.3	13.2	142.7	161.7	14.7	11.4	35.0
Mean	0.33	0.4	0.4	0.3	0.3	0.3	0.44	4.60	5.39	0.47	0.37	1.17
Ac-ft	20	24	25	18	17	18	26	283	321	29	23	69

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 11 Min 0.2 Mean 1.21 Ac-ft 873

Peak discharge (base, 20 cfs).--No peak above base.

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

Note.--Stage-discharge relation affected by ice Apr. 29 to May 4, May 10-13. No gage-height record Oct. 27 to Apr. 17 (stage-discharge relation affected by ice during most of period).

## GUNNISON RIVER BASIN

9-1329. West Hubbard Creek near Paonia, Colo.

Location.--Lat 39°01'55", long 107°36'50", in SE $\frac{1}{4}$  sec.1, T.12 S., R.92 W., on left bank 75 ft upstream from Overland ditch crossing, 3 miles south of Hubbard Park, and 11 miles north of Paonia.

Drainage area.--2.59 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,640 ft (from topographic map).

Extremes.--Maximum discharge during year, 39 cfs May 29 (gage height, 4.02 ft); minimum not determined.

Remarks.--Records good except those for period of no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	0.2	3.1	3.0
2.8	.5	3.2	4.8
2.9	1.0	3.4	11
3.0	1.8	3.8	28

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4							4.0	* 21	2.8	0.9	0.8
2	.4							5.0	19	2.5	1.7	.8
3	.5							5.5	15	2.3	1.4	1.0
4	.5							5.0	13	2.2	1.2	1.0
5	.5							4.0	13	2.2	1.0	1.5
6	.5							3.0	13	* 1.9	.9	1.8
7	.4							2.3	13	2.2	.8	1.6
8	.4						0.4	2.2	13	1.8	.8	1.4
9	.6							2.2	17	1.6	.8	2.2
10	.8							3.0	18	1.6	*.8	1.8
11	1.0							* 6.0	17	1.5	.7	1.2
12	.8							7.6	15	1.4	.7	1.0
13	.8							6.5	13	1.3	.8	.8
14	.8							3.5	* 11	1.3	.7	.8
15	.8							3.5	10	1.2	.8	.8
16	.6	0.5	0.4	0.4	0.4	0.4		.6	5.4	9.0	1.2	.8
17	.6							.6	7.3	7.9	1.2	.7
18	.6							.6	12	7.6	1.2	1.8
19	.6							.6	16	7.0	1.1	1.9
20	.6							.6	11	6.8	1.1	2.0
21	.6							.7	14	5.6	1.2	2.0
22	.6							.8	16	5.1	1.0	4.4
23	.6							.8	18	4.4	1.0	3.4
24	.5							.8	17	4.3	1.0	3.0
25	.5							.9	15	3.9	1.0	2.8
26	.6							1.0	19	3.4	1.0	2.6
27	*.5							1.0	26	3.2	.9	2.9
28	.5							1.1	24	2.9	.8	* 3.2
29	.5							1.4	26	2.6	.9	3.7
30	.5							2.0	26	2.8	1.0	3.4
31	.5								* 24	2.8	1.0	-----
Total	18.1	15.0	12.4	12.4	11.2	12.4	19.5	340.0	297.5	44.4	27.7	57.1
Mean	0.58	0.5	0.4	0.4	0.4	0.4	0.65	11.0	9.92	1.43	0.89	1.90
Ac-ft	36	30	25	25	22	25	39	674	590	88	55	113

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 26 Min - Mean 2.38 Ac-ft 1,720

Peak discharge (base, 40 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 27 to May 11 (stage-discharge relation affected by ice during most of period).

9-1345. Leroux Creek near Cedaredge, Colo.

Location.--Lat 38°55'35" (revised), long 107°47'35", in NW¼ sec.16, T.13 S., R.93 W., on right bank 200 ft upstream from headgate of Overland ditch, 400 ft upstream from Cow Creek, and 7 miles northeast of Cedaredge.

Drainage area.--43 sq mi, approximately.

Records available.--October 1936 to September 1956, October 1960 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 7,160 ft (by barometer).

Average discharge.--21 years, 47.8 cfs (34,610 acre-ft per year).

Extremes.--Maximum discharge during year, 404 cfs May 22 (gage height, 3.30 ft); minimum not determined.

1936-56, 1960-61: Maximum discharge, 1,310 cfs May 26, 1942 (gage height, 4.95 ft), from rating curve extended above 650 cfs; maximum gage height, 5.10 ft May 10, 1937 (backwater from diversion dam); minimum daily discharge, 1.8 cfs Nov. 10, 1950.

Remarks.--Records good except those for periods of ice effect, which are poor. One small diversion and several small reservoirs above station for irrigation below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-7, May 29, 30)

0.7	4.0	1.8	66
.9	7.5	2.4	170
1.1	13	3.0	320
1.5	33		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.1	8.5	5.0			4.0	5.4	81	173	29	28	31
2	7.5	8.5	4.8		(*)	4.2	6.3	111	152	28	29	33
3	7.5	*8.5	4.6			4.2	9.8	*125	125	25	26	35
4	7.5	8.2	4.4			4.0	15	107	104	24	24	34
5	7.5	8.0	4.0	(*)		4.0	15	70	*94	24	24	35
6	*7.5	7.5	3.8			4.2	13	52	86	20	25	*36
7	6.3	8.5	4.0			*4.2	10	43	84	22	26	32
8	6.3	8.0	*4.2			4.2	9	38	80	28	*30	31
9	6.7	5	4.0			4.6	8	56	74	28	31	37
10	9.0	6	4.0			4.6	6.5	94	74	27	32	27
11	15	6.5	4.0			4.6	6.5	154	74	28	32	24
12	13	6.5	4.2			4.4	6	*178	68	28	31	22
13	12	6.5	4.0			4.6	6	136	60	29	32	20
14	12	6	4.0			6	5.5	78	53	29	31	18
15	11	5.5	4.0			9.2	6	91	50	29	28	16
16	11	5.5	4.0	4	4	9.5	6.5	125	45	28	28	15
17	12	5.5	4.0			8.5	9.5	154	40	28	28	15
18	12	6	4.2			7.8	19	202	37	*29	29	22
19	11	6	4.0			6.7	23	245	33	32	28	27
20	10	5.5	4.0			6.1	26	184	31	32	28	20
21	10	5.0	4.0			5.5	25	188	*28	32	29	20
22	9.8	5.0	4.0			5.9	26	260	25	31	29	35
23	9.5	5.0	4.2			7.8	28	*296	24	30	27	30
24	9.8	5.0	4.0			8.5	24	278	24	29	28	26
25	9.0	5.5	4.0			6.7	*20	250	22	27	31	21
26	9.0	5.5	3.8			5.9	16	248	22	26	28	24
27	8.2	5.0	3.8			5.5	15	250	25	28	27	26
28	8.5	5.0	3.8			5.5	22	238	26	31	26	29
29	7.8	5.0	4.0			5.4	36	*242	26	30	26	31
30	5.5	5.0	4.0			*5.2	57	240	27	32	28	24
31	7	-----	4.0			5.7	-----	206	-----	31	31	-----
Total	286.0	187.2	126.8	124	112	177.2	481.0	5,020	1,791	874	880	796
Mean	9.23	6.24	4.09	4	4	5.72	16.0	162	59.7	28.2	28.4	26.5
Ac-ft	567	371	252	246	222	351	954	9,960	3,550	1,730	1,750	1,580

Calendar year 1960: Max - Min - Mean - Ac-ft -  
Water year 1960-61: Max 296 Min - Mean 29.7 Ac-ft 21,530

Peak discharge (base, 600 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 9 to Mar. 14, Apr. 6-17 (no gage-height record Jan. 16 to Mar. 7).

## GUNNISON RIVER BASIN

9-1347. Cow Creek near Cedaredge, Colo.

Location.--Lat 38°55'35", long 107°47'25", in N½ sec.16, T.13 S., R.93 W., on right bank at mouth 300 ft upstream from Overland ditch diversion headgate and 7 miles northeast of Cedaredge.

Drainage area.--6.90 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 114 cfs May 18 (gage height, 2.95 ft), from rating curve extended above 61 cfs; no flow for many days.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by one small diversion above station to Dever Creek drainage. Most of flow is water imported by Overland ditch from Overland Reservoir (capacity, 6,280 acre-ft) in West Muddy Creek drainage. Overland ditch also intercepts intermediate tributaries to North Fork Gunnison River during high flows.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	0	2.3	13
1.4	.2	2.5	23
1.5	.5	2.6	33
1.6	1.0	2.8	70
2.0	5.0	2.9	98

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0.5	19	30	36	39	0
2					(*)	0	.9	25	36	36	39	0
3						0	3.1	25	36	33	34	0
4						0	4.6	19	32	32	33	0
5				(*)		0	4.2	12	*32	6.8	32	0
6	(*)					0	3.5	9.4	36	1.7	31	*0
7						0	2.4	8.5	38	0	32	0
8			(*)			0	1.5	8.2	38	23	*31	0
9						0	1.1	13	38	42	32	0
10						0	.7	29	40	42	31	0
11						0	.5	48	39	42	31	0
12						0	.7	*50	36	50	31	0
13						0	1.0	38	33	48	29	0
14						0	.8	21	25	46	28	0
15						0	.6	22	25	42	28	0
16						0	.7	29	32	39	26	0
17						0	3.0	52	32	38	27	0
18						0	4.6	81	32	*34	26	.1
19						0	4.7	84	31	38	22	.1
20						0	5.2	*57	31	38	21	0
21						0	4.4	44	*31	38	22	0
22						0	5.0	46	29	34	16	.4
23						0	5.6	57	28	33	15	1.9
24						0	4.4	16	23	33	7.0	1.6
25						0	*3.6	4.7	21	33	5.6	1.0
26						0	2.6	19	18	33	4.8	.6
27						0	3.4	44	7.9	34	3.5	.4
28						0	4.7	34	1.7	34	1.4	.2
29						0	11	*39	0	34	0	.1
30					-----	*.1	16	44	25	34	0	.1
31		-----			-----	.2	-----	40	-----	36	0	-----
Total	0	0	0	0	0	0.3	105.0	1,036.8	856.6	1,043.5	678.3	6.5
Mean	0	0	0	0	0	0.01	3.50	33.4	28.6	33.7	21.9	0.22
Ac-ft	0	0	0	0	0	0.6	208	2,060	1,700	2,070	1,350	13

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 84 Min 0 Mean 10.2 Ac-ft 7,400

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 30 to Apr. 2, Apr. 8-16.



9-1378. George Creek near Grand Mesa, Colo.

Location.--Lat 38°57', long 108°02', in NW $\frac{1}{4}$  sec.5, T.13 S., R.95 W., on left bank 200 ft upstream from falls on Cedar Park ditch,  $\frac{3}{4}$  miles upstream from confluence with Sara Creek,  $\frac{7}{8}$  miles northwest of Cedaredge, and 8 miles southwest of Grand Mesa.

Drainage area.--8.3 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 60 cfs May 1 (gage height, 1.60 ft); minimum not determined.

1957-61: Maximum discharge, 75 cfs May 11, 1958 (gage height, 1.72 ft); minimum not determined.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by storage reservoirs, diversions above station for municipal water supply of town of Delta, and three small diversions above station for irrigation below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.0
.5	3.5
.6	5.5
.7	8.5
1.0	21

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	2.8			(*)		2.6	17	6.7	7.3	5.8	6.7
2	3.9	2.9					4.1	19	8.2	7.0	7.6	7.0
3	3.7	2.9					6.1	15	7.9	7.3	7.6	7.0
4	3.4	*2.9					8.9	12	7.3	7.6	7.0	6.7
5	3.9	2.9					7.2	9.3	8.5	7.6	6.1	6.7
6	3.7	2.9		(*)			6	7.3	7.0	7.9	5.5	*6.7
7	*3.7	3.4					5.1	6.1	7.9	6.7	4.9	6.4
8	4.1	3.0				1	3.7	6.1	8.9	5.8	4.9	6.7
9	4.3	3.0				(*)	3.6	7.3	*8.9	6.1	6.1	7.6
10	4.3	3.2					3.2	*11	10	6.4	*6.1	7.0
11	4.5	3.0					2.6	14	9.3	6.1	6.1	6.7
12	4.1	2.4					3.6	*15	8.5	6.4	6.1	6.7
13	3.4	2.0					4.1	13	8.5	6.4	5.8	6.7
14	3.7	2.0					3.2	8.2	8.9	6.1	5.8	6.1
15	4.3	2.0					3.2	7.6	8.9	6.1	5.8	6.1
16	4.5	2.0	1.5	1	1		3.4	8.9	9.3	5.8	6.4	6.1
17	4.3	2.0					4.9	10	8.5	5.3	6.1	6.1
18	4.3	2.0					5.8	14	8.2	5.8	6.1	7.0
19	4.1	2.0	(*)				5.5	16	10	*6.4	5.5	6.4
20	4.5	2.0					6.7	16	12	7.3	5.8	5.1
21	4.5	2.0					5.8	14	*12	6.7	5.5	5.3
22	4.5						8.2	18	12	5.8	5.3	7.0
23	4.7					1.5	6.7	16	12	5.8	5.1	7.9
24	4.7						*5.3	13	12	5.5	5.8	8.2
25	4.5						4.1	*12	12	5.3	7.3	7.0
26	3.9	1.5					4.5	13	12	5.8	6.4	6.7
27	3.2						6.1	12	9.3	5.8	5.8	6.7
28	2.9						9.7	11	8.5	5.1	6.4	6.4
29	2.6						13	8.5	7.9	5.5	7.0	5.8
30	2.4						15	7.6	7.3	6.4	6.7	5.5
31	2.6					(*)		6.4		5.8	6.7	
Total	121.7	66.8	46.5	31	28	39.0	171.9	364.3	278.4	194.9	189.1	198.0
Mean	3.93	2.23	1.5	1	1	1.3	5.73	11.8	9.28	6.29	6.10	6.60
Ac-ft	241	132	92	61	56	77	341	723	552	387	375	393

Calendar year 1960: Max 23 Min - Mean 5.31 Ac-ft 3,850

Water year 1960-61: Max 19 Min - Mean 4.74 Ac-ft 3,430

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 1, Nov. 9 to Apr. 1, Apr. 5, 6, 9-12, 15 (no gage-height record Nov. 22 to Mar. 30).

## GUNNISON RIVER BASIN

9-1392. Ward Creek near Grand Mesa, Colo.

Location.--Lat 38°59', long 107°58', on line between secs.25 and 26, T.12 S., R.95 W., on left bank 300 ft upstream from headgate of Lake Fork and Surface Creek Canal, 3½ miles upstream from William Creek, 4½ miles south of Grand Mesa, and 6 miles northwest of Cedaredge.

Drainage area.--14 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Prior to June 4, 1958, at site half a mile upstream at different datum.

Extremes.--Maximum discharge during year, 54 cfs May 20 (gage height, 2.47 ft); minimum daily determined, 1.4 cfs Nov. 16.  
1957-61: Maximum discharge, about 150 cfs May 25, 1958; minimum daily determined, 1 cfs Nov. 10-15, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by numerous small storage reservoirs. At times water is exported from Hotel Lake above station to Baron Lake in Kiser Creek basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-11, May 1-5)

1.4	1.0	1.8	6.2
1.5	1.5	2.0	13
1.6	2.5	2.2	23
1.7	4.0	2.5	49

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	1.8	1.5		(*)		2.1	11	22	12	20	16
2	5.5	1.8	1.5				2.3	*13	20	12	23	16
3	5.5	*1.8	1.6				3.2	16	24	12	22	16
4	10	1.8	1.6				3.7	13	24	12	22	16
5	9.8	1.7	1.6				3.6	9.5	22	12	22	11
6	9.5	1.7		(*)			3.4	7.5	*22	15	22	*9.8
7	*9.2	1.9					3.0	6.2	22	16	22	9.8
8	7.8	1.7				1.5	2.6	5.5	24	16	22	9.8
9	8.2	1.6					2.6	6.0	24	14	*22	9.8
10	8.2	1.6					2.6	11	22	14	22	9.5
11	8.2	1.6					2.6	15	21	14	22	9.2
12	8.2	1.6					2.6	*20	21	14	22	9.2
13	11	1.6					2.6	16	20	14	22	9.2
14	11	1.6					2.5	11	20	14	22	9.2
15	7.2	1.6		1.5	1.6		2.6	12	20	14	22	9.2
16	7.5	1.4					2.6	13	20	13	22	9.5
17	6.9	1.6					3.2	19	18	13	22	9.5
18	4.7	1.7	1.6				3.7	24	18	13	21	9.8
19	4.7	1.6	(*)				3.8	33	18	*13	16	9.5
20	4.7	1.6					4.0	38	*18	16	16	9.5
21	4.4	1.6					3.7	38	19	16	16	10
22	4.9	1.6					4.7	*40	17	16	16	9.8
23	4.7	1.6				2.0	4.7	40	18	16	16	8.2
24	4.4	1.6					*3.8	38	12	16	17	7.8
25	4.9	1.6					3.4	34	12	16	17	7.5
26	4.9	1.6					3.6	34	12	16	17	7.5
27	5.1	1.6					3.8	32	20	16	16	7.2
28	5.1	2.0					5.5	30	21	16	16	6.9
29	4.9	1.6					7.5	27	21	16	16	6.9
30	4.6	1.5					9.2	26	21	17	17	6.9
31	4.2							24		17	16	
Total	205.4	49.6	49.4	46.5	44.8	54.5	109.2	662.7	593	451	606	296.2
Mean	6.63	1.65	1.59	1.5	1.6	1.76	3.64	21.4	19.8	14.5	19.5	9.87
Ac-ft	407	98	98	92	89	108	217	1,310	1,180	895	1,200	588

Calendar year 1960: Max 53 Min 1.4 Mean 9.86 Ac-ft 7,160  
Water year 1960-61: Max 40 Min 1.4 Mean 8.68 Ac-ft 6,280

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 9-12, 14-17, 21, 22, 24-26, Apr. 8-12, 15, 16, 26, 27. No gage-height record Dec. 5 to Mar. 30 (stage-discharge relation affected by ice during most of period).

9-1402. Kiser Creek near Grand Mesa, Colo.

Location.--Lat 39°00', long 107°56', in N½ sec.19, T.12 S., R.94 W., on left bank a quarter of a mile upstream from unnamed tributary, 2½ miles south of Grand Mesa, 5½ miles upstream from Cottonwood Creek, and 7 miles northwest of Cedaredge.

Drainage area.--5.3 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 54 cfs Aug. 2 (gage height, 3.21 ft); minimum daily determined, 0.4 cfs Nov. 29.  
1957-61: Maximum discharge, 83 cfs June 7, 1958 (gage height, 3.40 ft); from rating curve extended above 33 cfs; minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station. Flow regulated by numerous small storage reservoirs. At times water is imported from Hotel Lake in Ward Creek basin to Baron Lake above station.

Rating table water year, 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.4	0.2	2.8	8.0
2.5	.6	2.9	14
2.6	2.0	3.0	23
2.7	4.5	3.2	52

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.5	0.7			(*)		0.6	5.6	5.6	18	35	9.8
2	2.8	.7					1.2	*7.0	5.2	18	36	12
3	2.8	*.7					2.0	7.3	5.2	19	22	12
4	2.8	.7					3.0	6.2	6.2	20	22	12
5	2.8	.6					2.2	4.8	6.2	20	19	3.0
6	2.8	.6		(*)			2.0	4.0	*9.2	20	19	*2.5
7	*2.8	.9					1.6	3.8	9.2	21	17	3.2
8	3.0	.6					1.3	3.5	9.2	23	12	3.5
9	3.2	.5					1.2	3.8	9.2	23	*20	4.0
10	4.0	.5					1.0	5.2	9.2	22	24	3.8
11	4.8	.5					1.0	6.6	8.6	22	24	3.5
12	4.5	.6					1.2	*8.0	8.6	22	35	4.5
13	4.0	.6					1.2	7.3	18	19	35	4.8
14	4.0	.6					1.0	5.6	18	19	35	8.6
15	4.2	.6					.9	5.6	16	24	35	9.8
16	4.0	.6	0.6	0.5	0.7	0.6	1.2	7.0	16	23	35	18
17	4.0	.5					1.7	7.3	15	24	42	18
18	4.0	.5					1.9	9.8	15	*24	42	18
19	4.0	.6	(*)				2.0	13	14	23	39	12
20	2.8	.6					2.2	11	*18	23	39	12
21	.9	.6					1.9	12	18	22	39	5.6
22	.7	.6					2.5	13	18	22	50	4.5
23	.7	.6					2.5	*12	18	22	50	3.2
24	.7	.7					*2.0	10	18	22	42	3.0
25	.6	.7					1.6	9.8	18	33	44	3.0
26	.6	.7					2.0	9.8	18	35	15	2.0
27	.7	.6					2.5	8.6	18	32	14	1.6
28	.7	.5					3.5	7.3	18	32	14	1.4
29	.7	.4					4.5	6.6	19	28	14	1.4
30	.8	.5					5.2	6.6	19	30	15	1.4
31	.6	-----			-----	(*)	-----	5.9	-----	30	9.8	-----
Total	77.5	18.1	18.6	15.5	19.6	18.6	58.6	234.0	403.6	735	893.8	202.1
Mean	2.50	0.60	0.6	0.5	0.7	0.6	1.95	7.55	13.5	23.7	28.8	6.74
Ac-ft	154	36	37	31	39	37	116	464	801	1,460	1,770	401

Calendar year 1960: Max 33 Min 0.4 Mean 6.60 Ac-ft 4,790  
Water year 1960-61: Max 50 Min 0.4 Mean 7.38 Ac-ft 5,350

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 9-30. No gage-height record Dec. 1 to Mar. 31 (stage-discharge relation affected by ice during most of period).

## GUNNISON RIVER BASIN

9-1407. Cottonwood Creek near Grand Mesa, Colo.

Location.--Lat 38°58' long 107°57', in SW $\frac{1}{4}$  sec.30, T.12 S., R.94 W., on left bank 300 ft upstream from culvert on State Highway 65,  $\frac{3}{4}$  miles upstream from mouth, 5 miles south of Grand Mesa, and  $\frac{5}{8}$  miles northwest of Cedaredge.

Drainage area.--2.5 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder and timber weir.

Extremes.--Maximum discharge during year, 14 cfs May 27 (gage height, 1.49 ft); no flow for many days.  
1957-61: Maximum discharge, about 35 cfs May 26, 1958; no flow for many days in 1959-61.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Flow regulated by numerous small storage reservoirs.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	0	0.8	2.3
.5	.1	1.1	6.2
.6	.2	1.3	9.2
.7	1.2	1.4	12

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	0.1		*0		0.1	5.2	4.9	6.3	0.2	0.1
2	0	.1	.1		0		.2	*5.3	4.2	5.9	.2	.1
3	0	*.1			0		.8	4.9	3.9	5.9	.2	.2
4	0				0		1.4	4.5	3.5	3.0	.2	.2
5	.1	.1			0		1.2	4.1	3.2	3.1	.1	.2
6	0	.1		(*)	0		1.0	3.9	*3.0	2.0	0	*.2
7	.1	.2			0		.5	3.9	2.7	1.3	0	.1
8	.1	.2			0		.4	4.0	2.6	.8	0	.1
9	.1	.1			0	0.1	.3	4.2	2.3	.4	*0	.3
10	.1	.1					.2	5.2	2.3	.2	0	.4
11	.4	.1					.2	6.1	2.4	.1	0	.1
12	.2	.1					.3	*6.2	2.4	.1	0	.1
13	.2	.1					.2	4.8	3.0	.1	0	.1
14	.6	.1					.2	3.5	3.0	.1	0	0
15	.7	.1	1				1.8	3.3	3.1	.1	0	.1
16	.7	.1					1.2	3.6	3.2	0	0	.1
17	.7	.1					1.3	4.0	3.0	0	0	.1
18	.5	.1					1.3	5.0	2.8	*0	0	.2
19	.2	.1	(**)		.1		1.3	5.8	2.7	0	0	.2
20	.2	.1					1.4	5.4	*6.2	0	0	.2
21	.2	.1				.2	1.1	5.4	7.0	0	0	.3
22	.2	.1					2.0	5.6	6.8	0	0	1.3
23	.2	.1					2.0	*5.0	6.7	0	0	1.3
24	.2	.1					*1.3	4.6	6.7	0	0	1.2
25	.2	.1					1.0	4.5	6.7	0	.2	.9
26	.2	.1				.1	1.0	5.7	6.8	0	.1	.8
27	.2	.1				.1	1.8	11	6.5	0	0	.8
28	.2	.1	0			.1	3.2	8.7	6.3	0	0	.5
29	.1	.1	0			.1	4.2	7.2	6.5	0	0	.5
30	.1	.1	0			.1	4.5	6.6	6.5	0	0	.4
31	.1	-----	0		-----	*.1	-----	5.7	-----	.1	.1	-----
Total	6.8	3.2	2.7	0	1.9	4.1	37.4	162.9	130.9	29.5	1.3	11.1
Mean	0.22	0.11	0.09	0	0.07	0.13	1.25	5.25	4.36	0.95	0.04	0.37
Ac-ft	13	6.3	5.4	0	3.8	8.1	74	323	260	59	2.6	22

Calendar year 1960: Max 20 Min 0

Water year 1960-61: Max 11 Min 0

Mean 1.34

Ac-ft 969

Mean 1.07

Ac-ft 777

\* Discharge measurement or observation of no flow made on this day.

\*\* Field estimate made on this day.

Note.---No gage-height record Dec. 3-27, Feb. 10 to Mar. 30 (stage-discharge relation affected by ice during most of periods).



9-1412. Youngs Creek near Grand Mesa, Colo.

Location.--Lat 38°58', long 107°55', in S½ sec.32, T.12 S., R.94 W., on left bank 200 ft upstream from bridge, a quarter of a mile downstream from Horse Creek, 4½ miles north of Cedaredge, and 6 miles southeast of Grand Mesa.

Drainage area.--10 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 36 cfs May 21 (gage height, 2.11 ft); minimum daily determined, 0.9 cfs, Mar. 5-9. 1957-61: Maximum discharge, 86 cfs June 6, 1958 (gage height, 2.77 ft); minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by numerous small storage reservoirs. At times water is diverted from Eureka Reservoirs No. 1 and 2 above station to Milk Creek in Surface Creek basin. Three small diversions above station for irrigation below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	0.7	1.4	5.6
1.0	1.5	1.6	11
1.2	3.0	2.0	30

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	1.9			(*)	1.0	1.2	16	15	8.9	4.2	4.3
2	1.6	1.7				1.0	1.6	*20	13	8.6	4.0	4.8
3	1.6	*1.8				1.2	3.0	18	11	6.8	3.3	5.3
4	1.7	1.7				1.0	4.5	15	11	6.3	5.0	3.3
5	1.5	1.7				.9	3.9	10	11	9.5	5.4	3.4
6	1.2	1.6		(*)		.9	3.3	7.5	*11	9.8	5.4	3.5
7	*1.2	1.8				*.9	2.7	6.8	12	8.0	5.0	2.6
8	1.2	1.7	(*)			.9	2.4	5.6	12	7.0	4.6	1.6
9	1.4	1.2				1.0	1.8	6.3	12	7.0	4.0	2.4
10	1.7	1.5				1.0	1.6	13	12	13	*3.8	2.3
11	2.8	1.7				1.1	1.5	22	12	13	3.9	2.4
12	2.0	1.6				1.1	2.4	*24	11	8.9	3.8	2.4
13	1.9	1.5				1.4	2.6	20	11	7.8	3.6	2.1
14	2.1	1.4				1.6	1.9	13	11	8.0	4.6	2.0
15	1.9	1.4				1.8	1.8	13	13	8.0	4.6	1.9
16	1.9	1.4	1.3	1.2	1.1	1.9	2.3	16	14	7.8	3.2	2.0
17	1.9	1.4				1.7	3.7	17	13	7.0	3.3	2.0
18	1.9	1.2				1.6	4.3	22	11	*6.3	2.1	5.6
19	1.8	1.2	(*)			1.5	3.8	26	9	6.3	1.9	7.0
20	1.7	1.2				1.2	4.2	22	*7.5	8.3	1.9	6.1
21	1.7	1.2				1.2	3.5	22	7.3	4.8	4.3	6.1
22	1.7	1.2				1.3	4.0	23	7.3	4.2	5.4	4.8
23	1.7	1.2				2.1	4.8	*24	6.3	3.9	3.7	3.5
24	1.6	1.2				2.0	*3.4	23	6.1	4.5	3.3	3.5
25	1.6	1.2				1.4	2.5	25	5.8	4.3	3.9	2.6
26	2.7	1.2				1.2	2.2	25	7.3	6.1	3.2	3.3
27	3.2	1.2				1.1	2.8	21	8.0	6.8	3.2	3.3
28	3.3	1.2				1.1	5.6	20	9.8	5.0	5.3	2.5
29	3.3	1.0				1.1	9.2	20	9.8	4.5	6.6	2.4
30	2.0	1.2				1.2	13	20	9.2	4.5	8.0	1.9
31	2.0	-----			-----	*1.2	-----	17	-----	4.5	8.3	-----
Total	59.4	42.4	40.3	37.2	30.8	39.6	105.5	553.2	309.4	219.4	132.8	100.9
Mean	1.92	1.41	1.3	1.2	1.1	1.28	3.52	17.8	10.3	7.08	4.28	3.36
Ac-ft	118	84	80	74	61	79	209	1,100	614	435	263	200

Calendar year 1960: Max 50 Min - Mean 5.97 Ac-ft 4,340  
 Water year 1960-61: Max 26 Min 0.9 Mean 4.58 Ac-ft 3,320

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 16 to Mar. 15. No gage-height record Dec. 5 to Mar. 7, June 15-20.

## GUNNISON RIVER BASIN

9-1430. Surface Creek near Cedaredge, Colo.

Location.--Lat 38°59', long 107°51', in NW¼ sec. 25, T.12 S., R.94 W., on left bank 5 ft downstream from private bridge, 1½ miles downstream from Caesar Creek, and 7 miles northeast of Cedaredge.

Drainage area.--28 sq mi, approximately.

Records available.--June 1939 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 8,180 ft (by barometer).

Average discharge.--22 years, 42.4 cfs (30,700 acre-ft per year).

Extremes.--Maximum discharge during year, 215 cfs May 11 (gage height, 2.38 ft); minimum daily, 2.4 cfs Jan. 3. 1939-61: Maximum discharge, 578 cfs May 12, 1941, from rating curve extended above 300 cfs; maximum gage height, 5.10 ft Apr. 13, 1958 (ice jam); minimum discharge not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by many small reservoirs. Some water imported from Leon Lake in Plateau Creek drainage.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 17-23)

0.6	2.5	1.5	55
.8	7.0	1.8	92
1.0	14	2.1	145
1.2	26		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	6	3.6	2.8	3.6	3.4	3.9	77	91	61	52	31
2	11	5	3.6	2.6	*3.6	*3.4	4.5	*96	84	59	53	24
3	11	*4.1	3.6	2.4	3.6	2.9	7.3	98	93	57	47	24
4	10	3.9	3.4	2.8	3.4	2.9	10	75	97	51	43	24
5	11	3.6	3.2	3.0	3.2	3.1	11	45	102	47	39	39
6	*12	3.7	3.0	*3.0	3.2	3.1	10	33	*107	65	36	*41
7	13	4.5	3.0	3.0	3.2	3.1	9.4	27	105	68	34	25
8	13	4.3	*3.0	3.0	3.2	3.2	7.0	25	104	57	37	19
9	14	5.0	3.0	3.2	3.4	3.4	6	38	104	53	37	30
10	16	5.0	3.2	3.2	3.6	4.0	5.5	77	107	53	*52	26
11	20	4.6	3.2	3.2	4.0	4.0	5.5	111	107	57	53	23
12	15	4.2	3.2	3.2	4.0	4.0	5.5	*131	105	56	52	19
13	13	3.8	3.2	3.2	4.0	4.0	5.5	84	117	47	52	18
14	14	3.6	3.2	3.2	4.0	4.2	6	59	115	46	52	22
15	11	3.4	3.0	3.2	4.0	4.6	7	65	104	48	53	26
16	11	3.6	2.8	3.2	3.6	4.6	8	83	100	51	54	35
17	11	3.2	2.8	3.2	3.4	4.6	9	87	88	51	60	36
18	11	3.0	2.6	3.0	3.2	4.4	13	100	83	*78	60	43
19	10	3.0	*2.6	2.8	3.2	4.2	13	117	79	79	51	37
20	10	3.0	2.6	2.8	3.4	4.0	16	97	*73	91	50	30
21	10	3.0	2.6	2.8	3.6	3.8	16	93	72	91	48	27
22	10	3.0	2.8	3.0	3.6	3.6	17	102	62	44	61	35
23	9.7	3.0	2.8	3.2	3.6	3.6	19	*104	60	39	62	19
24	9.7	3.2	3.0	3.4	3.4	3.0	*16	101	33	39	47	17
25	9.4	3.2	3.0	3.4	3.6	3.6	13	102	28	47	52	13
26	9.7	3.2	3.0	3.2	3.4	3.6	13	100	27	50	32	14
27	12	3.4	3.0	3.2	3.2	3.4	13	93	66	47	28	14
28	13	3.2	2.8	3.0	3.4	3.4	25	93	69	47	26	14
29	17	3.2	2.8	3.0	-	3.4	46	98	69	44	31	14
30	16	3.4	2.8	3.2	-----	3.4	57	101	68	45	34	12
31	12	-----	2.8	3.4	-----	*3.4	-----	96	-----	45	33	-----
Total	376.5	112.3	93.2	94.8	98.6	113.3	398.1	2608	2519	1713	1421	751
Mean	12.1	3.74	3.01	3.06	3.52	3.65	13.3	84.1	84.0	55.3	45.8	25.0
Ac-ft	747	223	185	188	196	225	790	5,170	5,000	3,400	2,820	1,490

Calendar year 1960: Max 170 Min - Mean 32.5 Ac-ft 23,620

Water year 1960-61: Max 131 Min 2.4 Mean 28.2 Ac-ft 20,430

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 5, Nov. 9 to Jan. 5, Jan. 9-24, Apr. 6, 9, 12, 14-17. No gage-height record Jan. 6-8, Jan. 25 to Mar. 2, Mar. 8-31 (stage-discharge relation affected by ice during most of period).

9-1435. Surface Creek at Cedaredge, Colo.

Location.--Lat 38°54', long 107°55', in sec.20, T.13 S., R.94 W., on left bank at Cedaredge, 500 ft east of State Highway 65 and 8½ miles upstream from mouth.

Drainage area.--43 sq mi, approximately.

Records available.--October 1916 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 6,500 ft (by barometer). Prior to June 8, 1917, staff gage at same site at datum 0.5 ft higher.

Average discharge.--45 years, 27.4 cfs (19,840 acre-ft per year).

Extremes.--Maximum discharge during year, 148 cfs May 11 (gage height, 1.55 ft); minimum daily, 1.3 cfs Jan. 5.

1916-61: Maximum discharge, 1,190 cfs May 13, 1941 (gage height, 2.50 ft), from rating curve extended above 640 cfs; no flow Sept. 25, 1939, and practically no flow at times in some winters.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by diversions to and from nearby streams, many small storage reservoirs, diversions for irrigation, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.8	0.7	14
.4	1.7	1.0	47
.5	3.7	1.4	116
.6	8.0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	4.4	2.0	1.8	*2.0	2.5	3.5	86	70	25	34	17
2	10	3.7	2.0	1.6	2.0	2.2	4.8	*103	65	25	38	17
3	10	*4.8	2.0	1.5	2.0	*2.3	9.3	106	58	26	33	18
4	10	4.4	2.0	1.4	2.0	2.0	16	92	60	24	32	17
5	9.3	3.7	1.6	1.3	2.0	2.2	19	59	*62	24	18	14
6	9.3	4.1	1.8	*1.4	2.0	2.3	19	43	72	31	14	*13
7	*8.0	5.5	2.0	1.5	2.0	2.3	18	37	70	34	13	13
8	7.0	5.5	*2.3	1.7	2.0	2.3	11	32	69	31	15	9.3
9	8.0	2.0	2.3	1.7	2.0	2.3	7.5	46	67	30	*18	11
10	10	2.2	2.3	1.7	2.0	2.4	7.5	88	69	31	19	8.6
11	19	2.2	2.3	1.8	2.3	2.5	7.0	110	69	35	16	5.1
12	14	2.4	2.3	1.8	2.5	2.5	4.4	*110	72	37	19	6.5
13	14	2.4	2.3	1.8	2.3	3.0	7.0	81	79	26	19	6.5
14	14	2.4	2.3	1.8	2.3	4.8	5.5	65	81	23	20	7.5
15	13	2.4	2.3	1.8	2.3	4.8	3.7	72	76	28	30	8.6
16	12	2.0	2.0	2.0	2.0	5.5	3.7	83	72	34	32	14
17	12	1.8	2.0	2.0	1.7	4.8	8.0	76	67	27	30	16
18	12	1.8	2.2	2.0	1.9	4.4	16	83	65	*31	28	20
19	11	1.8	2.0	1.8	2.2	3.7	16	81	64	28	30	30
20	9.3	1.8	2.0	1.8	2.2	3.5	20	69	*53	39	32	25
21	9.3	2.0	2.0	1.8	2.3	3.2	20	74	50	39	31	22
22	10	2.0	2.0	1.8	2.5	3.5	20	83	48	22	38	34
23	9.3	2.0	2.0	2.0	2.3	5.5	27	*79	48	20	40	24
24	9.3	2.0	2.2	2.0	2.5	9.3	*22	72	28	20	26	21
25	8.0	1.8	2.2	2.0	2.2	5.5	15	77	20	26	27	15
26	8.6	1.7	2.0	1.8	2.2	3.2	12	79	19	27	18	16
27	10	2.2	1.8	1.8	2.2	3.0	15	77	20	26	14	17
28	9.3	2.0	1.8	1.8	2.2	3.0	33	77	19	25	14	16
29	8.5	1.8	1.8	2.0	-	2.5	58	79	26	28	14	15
30	7	1.8	1.8	2.0	-----	2.3	70	76	28	32	16	14
31	6	-----	1.8	2.0	-----	*2.7	-----	72	-----	31	18	-----
Total	317.2	80.6	63.4	55.2	60.1	106.0	498.9	2367	1666	885	746	471.1
Mean	10.2	2.69	2.05	1.78	2.15	3.42	16.6	76.4	55.5	28.5	24.1	15.7
Ac-ft	629	160	126	109	119	210	990	4,690	3,300	1,760	1,480	934

Calendar year 1960: Max 130 Min 0.6 Mean 21.4 Ac-ft 15,570

Water year 1960-61: Max 110 Min 1.3 Mean 20.0 Ac-ft 14,510

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29 to Nov. 1, Nov. 10-25, Nov. 28 to Dec. 2, Dec. 6, 7, Dec. 16 to Feb. 5, Mar. 8-10.

## GUNNISON RIVER BASIN

9-1442. Tongue Creek at Cory, Colo.

Location.--Lat 38°47', long 108°00', in S $\frac{1}{2}$  sec. 34, T.14 S., R.95 W., on left bank at downstream side of bridge, 500 ft upstream from North Delta Canal headgate, half a mile west of Cory, and 1 mile upstream from mouth.

Drainage area.--200 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 61 cfs Sept. 23 (gage height, 2.89 ft); minimum daily, 1.1 cfs Aug. 2, 6.  
1957-61: Maximum discharge, 748 cfs June 7, 1958 (gage height, 5.32 ft); minimum daily, 1.1 cfs Aug. 2, 6, 1961.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by many small storage reservoirs, diversions for irrigation, and return flow from irrigated areas. Diversions to and from nearby streams.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 8 to Sept. 22)

1.7	1.0	2.2	11
1.8	2.0	2.4	21
1.9	3.0	2.6	36
2.0	5.0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	22	20	16	*16	11	12	4.6	4.0	1.7	1.6	2.2
2	5.6	19	20	16	16	12	12	8.9	4.0	1.4	1.1	2.2
3	7.1	18	20	17	16	*16	12	6.5	3.6	1.6	1.2	3.4
4	7.7	*18	22	20	16	16	8.9	4.4	4.2	1.5	1.4	2.8
5	7.7	19	20	*21	15	15	8.9	3.0	3.0	1.4	1.2	2.5
6	8.3	19	20	22	15	15	9.2	2.5	*2.9	1.3	1.1	*2.5
7	*8.0	22	21	22	15	14	9.2	3.2	2.7	1.5	1.2	2.3
8	8.3	21	*21	21	16	15	9.2	3.0	2.7	1.8	*1.8	2.3
9	9.5	20	22	20	16	16	7.4	2.8	2.5	2.1	1.8	3.0
10	12	20	21	18	16	17	8.0	*7.4	2.6	1.9	1.7	3.8
11	16	21	20	18	16	17	8.3	11	2.7	1.9	1.7	3.6
12	13	21	20	18	16	16	4.6	7.7	2.7	2.0	2.0	3.4
13	12	20	20	17	15	16	2.1	4.8	2.2	2.2	2.2	3.0
14	17	20	19	17	12	16	1.9	2.9	2.1	2.3	2.3	3.0
15	18	20	19	16	11	15	1.8	3.0	1.9	1.9	2.6	2.9
16	18	19	18	16	12	15	1.7	9.5	1.8	2.3	2.6	3.8
17	18	20	19	15	12	16	1.7	2.8	2.0	2.0	2.6	4.2
18	19	20	20	15	14	14	2.0	3.2	2.1	*2.3	2.4	4.6
19	18	20	20	15	12	13	2.0	4.6	1.9	1.9	2.2	5.3
20	18	20	19	14	12	13	*1.5	3.6	1.4	1.7	2.1	5.3
21	19	20	17	14	12	14	2.2	4.2	*1.2	2.2	2.1	7.1
22	20	20	18	15	12	12	2.5	4.4	1.2	2.0	2.1	16
23	20	20	17	16	13	12	3.2	3.4	1.2	1.7	2.3	29
24	22	20	17	17	11	12	3.0	*3.4	1.3	1.8	2.4	29
25	22	19	17	17	11	12	2.8	3.8	1.5	1.6	2.6	28
26	20	19	17	17	12	12	2.8	3.8	1.5	1.3	2.2	27
27	21	19	17	17	11	12	2.8	3.2	1.6	1.4	2.1	27
28	20	19	17	16	12	14	2.5	3.8	1.2	1.5	2.1	25
29	20	18	16	15	-	14	3.4	3.2	1.3	1.6	2.1	22
30	19	20	16	16	-----	14	8.6	3.2	1.3	2.0	2.0	22
31	20	-----	17	16	-----	*12	-----	4.0	-----	2.0	2.0	-----
Total	4 71.0	5 93	5 87	5 30	3 83	4 3 8	1 5 8.2	1 3 9.8	6 6.3	5 5.8	6 0.8	2 9 8.2
Mean	15.2	19.8	18.9	17.1	13.7	14.1	5.27	4.51	2.21	1.80	1.96	9.94
Ac-ft	934	1,180	1,160	1,050	760	869	314	277	132	111	121	591

Calendar year 1960: Max 89

Min 1.4

Mean 13.6

Ac-ft 9,880

Water year 1960-61: Max 29

Min 1.1

Mean 10.4

Ac-ft 7,500

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 7, 8, 14-17, Dec. 21 to Jan. 24, Jan. 29, Feb. 6, 7, 24.



9-1462. Uncompahgre River near Ridgway, Colo.

Location.--Lat 38°11'05", long 107°44'40", in NE $\frac{1}{4}$  sec. 4, T.45 N., R.8 W., on right bank 15 ft upstream from bridge, 0.7 mile upstream from Dallas Creek, and 2 miles north of Ridgway.

Drainage area.--150 sq mi, approximately.

Records available.--October 1958 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 6,877.58 ft above mean sea level (levels by Bureau of Reclamation).

Extremes.--Maximum discharge during year, 970 cfs May 27 (gage height, 4.48 ft); minimum daily, 37 cfs Mar. 9.

1958-61: Maximum discharge, 1,270 cfs June 17, 1960 (gage height, 4.75 ft); minimum daily, 32 cfs Jan. 6, 7, 1960.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation above station. Water is imported above station by Red Mountain ditch from Mineral Creek in San Juan River basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 28-30)

1.6	37	3.0	325
1.9	70	4.0	780
2.3	130		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	60	55	47	40	43	73	295	714	302	153	91
2	56	*60	55	46	44	44	68	346	665	286	163	91
3	56	60	56	46	42	45	79	353	530	259	250	117
4	56	60	57	46	42	45	109	302	456	247	238	117
5	*56	60	45	46	42	45	109	194	502	232	247	125
6	56	60	*40	46	*43	45	*83	145	*543	197	194	*114
7	56	69	38	46	46	41	87	125	605	211	156	102
8	55	66	38	44	41	*39	86	112	676	205	140	98
9	59	66	40	42	41	37	78	125	736	194	*130	140
10	60	64	42	*40	41	41	84	214	708	180	125	136
11	62	63	42	40	44	43	86	308	698	*170	128	121
12	60	56	46	40	44	45	90	332	703	161	175	109
13	60	59	49	40	46	51	89	286	665	163	128	102
14	64	60	48	40	46	64	75	202	635	158	116	102
15	66	60	46	41	47	82	66	158	625	153	110	98
16	68	57	44	40	49	87	68	153	570	149	145	109
17	70	57	44	40	50	98	74	178	552	138	168	100
18	80	57	46	40	48	93	93	247	538	134	163	123
19	79	57	51	40	46	79	109	384	530	123	143	151
20	75	57	51	40	45	79	132	424	552	119	138	188
21	70	56	50	40	45	79	132	416	538	134	136	145
22	69	56	54	42	46	79	123	*548	*494	123	117	197
23	68	56	52	42	46	84	143	548	444	110	109	263
24	66	55	51	42	42	83	134	480	432	108	116	202
25	65	55	51	43	43	75	104	548	408	108	134	168
26	65	56	51	43	44	68	91	640	380	114	117	156
27	63	59	52	45	43	63	87	698	360	117	102	149
28	65	58	51	44	44	65	110	747	325	114	94	145
29	64	54	51	44	-	65	183	730	322	130	93	134
30	62	56	46	42	-----	68	256	708	322	151	94	126
31	62	-----	46	43	-----	71	-----	670	-----	138	94	-----
Total	1,968	1,769	1,488	1,320	1,240	1,946	3,101	11,616	16,228	5,128	4,416	4,024
Mean	63.5	59.0	48.0	42.6	44.3	62.8	103	375	541	165	142	134
Ac-ft	3,900	3,510	2,950	2,620	2,460	3,860	6,150	23,040	32,190	10,170	8,760	7,980

Calendar year 1960: Max 998 Min 32 Mean 158 Ac-ft 115,000

Water year 1960-61: Max 747 Min 37 Mean 149 Ac-ft 107,600

Peak discharge (base, 1,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 6, 7, 16, 17, 30, 31, Jan. 2-9, 11-14, 16-23.

9-1464. West Fork Dallas Creek near Ridgway, Colo.

Location.--Lat 38°04'30", long 107°51'10", in SE $\frac{1}{4}$  sec. 9, T.44 N., R.9 W., on right bank 100 ft downstream from unnamed tributary, 5 miles upstream from confluence with East Fork Dallas Creek, and  $7\frac{1}{2}$  miles southwest of Ridgway.

Drainage area.--13.2 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,400 ft (from topographic map).

Average discharge.--6 years, 12.8 cfs (9,270 acre-ft per year).

Extremes.--Maximum discharge during year, 46 cfs June 21 (gage height, 2.49 ft); maximum gage height, 3.25 ft Dec. 6 (ice jam); minimum daily discharge, 2.4 cfs Jan. 14.

1955-61: Maximum discharge, 187 cfs July 2, 1957 (gage height, 3.40 ft), from rating curve extended above 47 cfs; maximum gage height, 3.46 ft Mar. 17, 1959; minimum daily discharge, 2.4 cfs Jan. 14, 1961.

Remarks.--Records good except those for periods of ice effect, which are poor. One diversion above station for irrigation below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	1.7	2.2	21
1.8	3.3	2.3	27
1.9	6.3	2.4	34
2.0	10	2.6	50

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	5.7	4.2	3.0	2.8	2.8	2.8	2.2	3.3	2.8	1.6	11
2	6.7	* 5.7	4.2	2.8	2.8	2.8	3.0	2.3	3.3	2.9	1.8	10
3	6.7	5.7	4.2	2.6	3.0	2.8	3.9	* 2.5	3.3	2.9	3.6	12
4	6.3	5.7	3.6	2.6	2.8	2.8	4.8	2.2	3.0	2.9	3.4	12
5	* 6.3	5.7	3.2	2.8	3.0	2.8	4.5	2.0	3.4	2.8	2.5	12
6	6.3	5.7	3.0	3.0	3.0	2.8	4.0	1.8	* 3.4	2.6	1.7	12
7	6.0	5.5	3.4	3.0	3.1	2.8	3.6	1.6	3.2	2.5	1.5	* 12
8	6.0	5.7	3.6	3.0	3.1	2.8	3.2	1.6	3.2	2.6	1.3	13
9	6.0	5.2	3.4	3.0	3.1	2.8	3.0	1.6	3.4	2.6	1.4	18
10	6.3	5.0	3.4	2.8	3.1	2.8	3.1	1.8	3.4	2.5	* 1.5	23
11	6.7	5.0	3.2	2.8	3.1	2.8	3.1	2.2	3.5	* 2.3	1.4	19
12	6.0	5.0	3.2	2.6	3.0	2.8	3.4	2.2	3.6	2.2	1.6	15
13	6.0	5.1	3.4	2.6	3.0	3.0	3.6	2.0	3.6	2.2	1.6	13
14	5.7	5.0	3.2	2.4	3.0	3.0	3.1	1.7	3.5	2.1	1.5	12
15	6.3	4.8	3.2	2.6	3.0	3.1	3.6	1.6	3.4	2.0	1.5	12
16	7.1	4.6	3.4	2.8	3.0	3.1	4.0	1.7	3.5	2.0	1.5	11
17	8.0	4.6	3.4	3.0	3.0	3.0	4.2	1.8	3.7	1.9	1.6	10
18	8.0	4.8	3.4	3.0	3.0	3.0	5.7	1.9	3.7	1.8	1.6	15
19	7.6	4.8	3.2	2.8	3.0	3.0	* 8.8	2.3	3.9	1.8	1.6	19
20	7.1	4.8	3.0	2.8	3.1	3.0	1.2	2.5	4.1	1.8	1.5	15
21	6.7	4.8	3.2	2.8	3.1	* 2.8	1.1	2.5	* 4.2	1.8	1.5	14
22	6.7	4.4	3.2	2.8	3.1	2.8	1.2	* 2.6	3.6	1.6	1.4	16
23	6.7	4.6	3.0	3.0	3.1	3.1	1.2	2.6	3.8	1.6	1.4	20
24	6.7	4.8	2.8	3.0	2.8	3.1	1.1	2.4	3.6	1.6	1.3	15
25	6.3	4.5	2.8	3.0	2.8	2.8	1.0	2.6	3.4	1.5	1.3	13
26	6.3	4.2	2.8	3.0	2.8	2.6	9.7	2.7	3.3	1.6	1.2	12
27	6.0	4.2	3.0	2.8	2.8	2.7	1.1	3.0	3.4	1.5	1.0	10
28	6.3	4.0	2.8	2.6	2.8	2.6	1.4	2.9	3.6	1.5	9.7	10
29	5.7	4.0	2.8	2.6	-	2.7	1.7	3.0	3.4	1.5	9.7	9.7
30	5.5	4.2	2.8	2.8	-----	2.7	2.0	3.0	3.0	1.5	1.0	9.7
31	5.5	-----	3.0	3.0	-----	2.6	-----	3.2	-----	1.5	1.1	-----
Total	199.8	147.8	101.0	87.4	83.3	88.3	215.1	70.0	104.7	64.4	488.4	405.4
Mean	6.45	4.93	3.26	2.82	2.98	2.85	7.17	22.6	34.9	20.8	15.8	13.5
Ac-ft	396	293	200	173	165	175	427	1,390	2,080	1,280	969	804

Calendar year 1960: Max 69 Min 2.5 Mean 11.3 Ac-ft 8,210  
 Water year 1960-61: Max 42 Min 2.4 Mean 11.5 Ac-ft 8,350

Peak discharge (base, 30 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5- 2	5:30p.m.	2.39	34	6-21	8:30p.m.	2.49	46
5-19	11:30p.m.	2.34	30	8- 3	11:30p.m.	2.45	41
6- 6	2a.m.	2.53	39				

\* Discharge measurement made on this day.  
 Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 7, 9-12, 14-18, 20-23, 28, 29, Dec. 4 to Feb. 6, Feb. 24, Mar. 8, 26, 28, 31, Apr. 6, 8, 9, 12, 15, 16.

9-1465. East Fork Dallas Creek near Ridgway, Colo.

Location.--Lat 38°05'40", long 107°48'40", in SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.2, T.44 N., R.9 W., on right bank 300 ft below private bridge, 2 miles upstream from Beaver Creek, and 5 miles southwest of Ridgway.

Drainage area.--16.8 sq mi (revised). Area at site used prior to October 1960, 17.3 sq mi (revised).

Records available.--October 1947 to September 1953, October 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,980 ft (from topographic map). Prior to Oct. 1, 1960, water-stage recorder at two sites three-quarters of a mile downstream at different datums. Datum raised 3.00 ft Oct. 1, 1949.

Average discharge.--7 years, 23.2 cfs (16,800 acre-ft per year).

Extremes.--Maximum discharge during year, 164 cfs June 13 (gage height, 3.50 ft); minimum daily determined, 4.4 cfs Mar. 26-29. 1947-53, 1960-61: Maximum discharge, 297 cfs June 18, 1949 (gage height, 3.43 ft, site and datum then in use), from rating curve extended above 100 cfs; minimum daily determined, 4.4 cfs Mar. 26-29, 1961.

Remarks.--Records good except those for periods of no gage-height record, which are poor. One small diversion above station diverts water to Beaver Creek drainage for irrigation of about 50 acres of hay meadows.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Aug. 9 to Sept. 8)

1.8	3.5	2.6	44
2.0	9.5	3.0	88
2.3	22	3.5	162

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	11					5.5	15	52	68	40	22
2	12	(*)					6	*16	60	64	45	21
3	12						6.5	16	57	60	66	21
4	12						7.1	16	61	58	60	21
5	*11						*7.1	16	62	56	58	20
6	11		(*)		(*)		6.5	15	*64	52	43	*20
7	11						6.5	14	80	50	38	20
8	11					(*)	5.3	13	89	50	34	21
9	11						6.5	13	105	51	31	29
10	11			(*)			6.5	14	*109	50	*29	34
11	11					5.5	5.9	15	112	*48	28	31
12	11						6.2	16	120	48	37	27
13	11						6.2	16	120	48	34	24
14	12						5.3	15	110	46	30	22
15	12						6.5	15	112	44	30	22
16	12	10	8	6.5	5.5		6.5	15	99	45	34	21
17	12						6.2	15	101	42	42	21
18	12						7.4	15	102	42	41	32
19	12						8.0	17	108	42	40	38
20	12					(*)	8.3	22	117	42	42	34
21	12						5.6	8.3	*117	42	43	32
22	12						5.9	8.3	*31	116	37	34
23	12						5.9	8.3	36	102	37	34
24	12						6.2	8.3	35	95	36	32
25	12						5.6	7.4	36	91	34	29
26	12						4.4	7.7	36	86	35	27
27	12						4.4	8.6	39	78	37	27
28	12						4.4	8.6	46	72	37	27
29	11						4.4	12	44	72	40	26
30	11						4.7	15	47	69	40	24
31	11						5		50		36	23
Total	360	301	248	201.5	154.0	166.5	222.5	733	2,738	1,417	1,138	795
Mean	11.6	10.0	8	6.5	5.5	5.37	7.42	23.6	91.3	45.7	36.7	26.5
Ac-ft	714	597	492	400	305	330	441	1,450	5,430	2,810	2,260	1,580

Calendar year 1960: Max - Min - Mean - Ac-ft -  
Water year 1960-61: Max 120 Min 4.4 Mean 23.2 Ac-ft 16,810

Peak discharge (base, 120 cfs).--June 13 (1 a.m.) 164 cfs (3.50 ft); June 21 (11 p.m.) 159 cfs (3.50 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 2 to Mar. 20 (stage-discharge relation affected by ice during most of period), Mar. 31 to Apr. 2.

## GUNNISON RIVER BASIN

9-1465.5. Beaver Creek near Ridgway, Colo.

Location.--Lat 38°07'00", long 107°49'00", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.25, T.45 N., R.9 W., on left bank 10 ft below private bridge, 300 ft upstream from mouth, and 4 miles southwest of Ridgway.

Drainage area.--12.0 sq mi.

Records available.--October 1960 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,680 ft (from topographic map).

Extremes.--Maximum discharge during year, 23 cfs Aug. 17 (gage height, 2.87 ft), from rating curve extended above 6.4 cfs; minimum daily, 1.0 cfs Oct. 1, 2.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Two small diversions above station for irrigation of 150 acres of hay meadows. Small diversion from East Fork Dallas Creek for irrigation of about 50 acres of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	0.5	2.1	5.1
1.8	1.1	2.3	8.4
1.9	2.1		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	3.4	2.2	2.4	2.4	2.4	2.6	5.9	6.2	6.1	4.5	3.4
2	1.0	*3.3	2.4	2.2	2.4	2.8	2.8	*5.9	6.4	5.4	3.8	3.4
3	1.1	3.3	2.4	2.2	2.6	2.8	3.2	5.7	6.7	4.8	8.3	3.9
4	1.2	3.3	1.8	2.4	2.4	2.4	3.4	5.9	6.5	4.5	6.4	3.4
5	*1.3	3.3	1.2	2.6	2.2	2.6	*3.4	6.4	6.7	4.6	5.6	3.0
6	1.5	3.3	*1.2	2.4	*2.2	2.4	3.2	6.2	*5.3	4.5	3.6	*3.4
7	1.7	3.2	1.2	2.6	2.4	2.0	3.6	6.1	4.6	6.1	3.4	4.5
8	1.7	3.2	1.4	3.0	2.2	*1.8	3.4	5.9	4.4	6.1	4.2	4.6
9	1.9	3.0	1.6	3.2	2.6	1.9	3.2	5.7	3.6	4.5	*3.8	5.1
10	2.0	3.0	1.6	*3.2	2.4	2.4	3.6	4.0	3.3	4.2	3.2	5.1
11	3.0	3.0	1.6	3.0	2.6	2.6	3.8	2.2	3.8	*4.4	4.4	4.6
12	4.4	3.2	1.6	3.2	2.8	2.6	4.0	1.9	4.8	4.4	4.2	4.4
13	4.0	3.0	1.8	3.0	2.8	2.6	3.8	1.8	4.8	4.4	3.8	4.0
14	4.0	3.2	1.8	3.0	2.6	2.8	3.8	1.9	4.8	4.0	3.3	4.0
15	3.9	2.8	1.8	3.0	2.6	3.0	3.4	1.8	4.8	3.9	3.3	4.0
16	3.9	2.6	1.6	3.0	2.6	3.2	3.6	1.8	4.5	3.8	4.5	4.4
17	3.8	2.4	1.8	3.0	2.8	3.4	4.2	1.8	4.8	3.8	6.2	4.0
18	4.4	2.4	2.0	3.0	2.6	3.4	4.5	1.8	5.1	3.9	5.0	4.4
19	4.4	2.6	2.0	2.8	2.2	2.8	4.8	1.7	5.3	3.6	3.4	4.5
20	3.9	2.4	1.8	2.6	2.4	3.2	5.1	1.6	6.2	3.0	3.3	4.5
21	3.9	2.6	1.8	2.4	2.6	3.0	4.8	1.8	*6.7	3.8	3.0	4.0
22	3.6	2.6	2.0	2.4	2.6	2.8	5.0	*2.0	7.6	3.6	2.8	4.6
23	3.4	2.6	2.2	2.4	2.2	3.0	5.1	2.2	7.0	3.3	2.7	5.0
24	3.4	2.6	2.2	2.6	2.4	3.2	5.3	2.8	7.7	3.2	2.8	4.6
25	3.4	2.4	2.4	2.8	2.6	3.0	5.1	3.8	7.0	3.3	3.9	4.2
26	3.4	2.4	2.4	2.6	2.4	2.4	5.1	4.0	7.0	3.6	3.9	3.9
27	3.6	2.2	2.4	2.4	2.2	2.6	5.1	4.6	7.0	3.6	3.6	3.8
28	3.6	2.0	2.2	2.2	2.4	2.6	5.4	4.6	6.7	3.6	3.6	3.4
29	3.4	2.0	2.2	2.4	-	2.4	5.7	4.8	6.9	3.6	4.2	3.4
30	3.3	2.2	2.4	2.4	-----	2.6	5.7	5.3	7.2	3.6	3.8	3.4
31	3.4	-----	2.4	2.4	-----	2.4	-----	5.7	-----	3.6	3.6	-----
Total	92.5	83.5	59.4	82.8	69.2	83.1	125.7	117.6	173.4	128.8	126.1	122.9
Mean	2.98	2.78	1.92	2.67	2.47	2.68	4.19	3.79	5.78	4.15	4.07	4.10
Ac-ft	183	166	118	164	137	165	249	233	344	255	250	244

Calendar year 1960: Max - Min - Mean - Ac-ft -  
 Water year 1960-61: Max 8.3 Min 1.0 Mean 3.47 Ac-ft 2,510

Peak discharge (base, 15 cfs)--Aug. 11 (12:30 p.m.) 16 cfs (2.63 ft); Aug. 17 (3 p.m.) 23 cfs (2.87 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7-11, Nov. 16 to Mar. 8, Apr. 15, 16. No gage-height record Oct. 1-5, Nov. 29 to Mar. 8, Mar. 11 to Apr. 11.



9-1466. Pleasant Valley Creek near Noel, Colo.

Location--Lat 38°08'50", long 107°55'00", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.13, T.45 N., R.10 W., on right bank 3 miles north of Noel and 7 miles upstream from mouth.

Drainage area--7.88 sq mi.

Records available--October 1955 to September 1961.

Gage--Water-stage recorder and concrete control. Altitude of gage is 8,680 ft (from topographic map).

Average discharge--6 years, 2.65 cfs (1,920 acre-ft per year).

Extremes--Maximum discharge during year, 155 cfs Apr. 28 (gage height, 3.36 ft); minimum daily determined, 0.1 cfs for many days.  
1955-61: Maximum discharge, about 500 cfs July 29, 1957 (gage height, 4.60 ft), from rating curve extended above 140 cfs; no flow for some days in July 1958, September, October, and November 1959.

Remarks--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	0.02	2.1	6.4
1.6	.2	2.3	13
1.7	.5	2.5	24
1.8	1.2	2.7	45
1.9	2.2	2.9	75

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	*0.1					0.2	1.9	0.2	0.1	0.1	0.1
2	.1	.1					.2	1.4	.2	.1	1.7	.1
3	.1	.1					.2	*1.0	.2	.1	.3	.1
4	*.1	.1					1.2	7.5	.2	.1	.2	.1
5	.1	.1					2.8	11	.2	.1	.1	.1
6	.1	.1					2.0	11	.2	.1	.1	.1
7	.1	.1					1.6	10	*.2	.1	.1	*.1
8	.1	.1					1.5	8.6	.2	.1	.1	.1
9	.1	.1					1.2	6.4	.2	.1	.1	.1
10	.1	.1					.8	5.0	.2	.1	*.1	.4
11	.1	.1				0.1	.7	3.5	.1	.1	.1	.1
12	.1	.1					.6	2.2	.1	*.1	.1	.1
13	.1	.1					.8	2.6	.1	.1	.1	.1
14	.1	.1					.7	5.9	.1	.1	.1	.1
15	.1	.1					.7	4.1	.1	.1	.1	.1
16	.1	.1	0.1	0.1	0.1		.9	2.4	.1	.1	.1	.1
17	.1	.1					1.2	1.9	.1	.1	.1	.1
18	.1	.1					7.8	1.4	.1	.1	.1	.1
19	.1	.1					26	1.1	.1	.1	.1	.1
20	.1	.1					60	.9	.1	.1	.1	.1
21	.1	.1				(*)	54	.7	*.1	.1	.1	.1
22	.1	.1				.1	7.4	*.6	.1	.1	.1	.1
23	.1	.1				.1	58	.6	.1	.1	.4	1.2
24	.1	.1				.2	18	.5	.1	.1	.3	.2
25	.1	.1				.3	*1.6	.4	.1	.1	.4	.1
26	.1	.1				.4	1.7	.4	.1	.1	.1	.1
27	.1	.1				.4	3.2	.4	.1	.1	.1	.1
28	.1	.1				.4	5.7	.4	.1	.1	.1	.1
29	.1	.1				.3	5.1	.3	.1	.1	.1	.1
30	.1	.1				.3	3.0	.3	.1	.1	.1	.1
31	.1	-----			-----	.2	-----	.3	-----	.4	.1	-----
Total	3.1	3.0	3.1	3.1	2.8	4.8	518.1	133.4	4.0	3.4	5.8	4.5
Mean	0.10	0.10	0.1	0.1	0.1	0.15	17.3	4.30	0.13	0.11	0.19	0.15
Ac-ft	6.1	6.0	6.1	6.1	5.6	9.5	1,030	265	7.9	6.7	12	8.9

Calendar year 1960: Max 106 Min 0.1 Mean 3.45 Ac-ft 2,510

Water year 1960-61: Max 74 Min 0.1 Mean 1.89 Ac-ft 1,370

Peak discharge (base, 50 cfs)--Apr. 22 (3:30 p.m.) 139 cfs (3.28 ft); Apr. 28 (5:30 p.m.) 155 cfs (3.36 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Mar. 21, Apr. 6, 7, 9, 11, 12, 14-16. No gage-height record Nov. 24 to Mar. 21, July 10-19.

9-1470. Dallas Creek near Ridgway, Colo.

Location.--Lat 38°10'30", long 107°45'40", in SE $\frac{1}{4}$  sec. 5, T.45 N., R.8 W., on right bank 20 ft downstream from highway bridge,  $\frac{1}{2}$  miles upstream from mouth, and  $\frac{1}{2}$  miles northwest of Ridgway.

Drainage area.--90 sq mi, approximately.

Records available.--March 1922 to October 1927, October 1955 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 6,980 ft (from topographic map). Mar. 1, 1922, to Oct. 31, 1927, staff gage at different datum.

Average discharge.--11 years, 41.7 cfs (30,190 acre-ft per year).

Extremes.--Maximum discharge during year, 298 cfs July 30 (gage height, 4.16 ft); minimum daily, 1.5 cfs May 21, 26.

1922-27, 1955-61: Maximum discharge observed, 1,120 cfs Aug. 15, 1923 (gage height, 4.40 ft, datum then in use), from rating curve extended above 160 cfs; minimum daily, 0.8 cfs Oct. 14, 1955, May 10-13, 18, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of about 4,500 acres above and 700 acres below station. One small diversion from Leopard Creek (Dolores River basin).

Note.--Records for August and September 1960 are in error. Revised records for this period are on file in District Office and will be published in a later water supply paper.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	0.8	2.3	5.2	2.9	47
2.1	1.6	2.5	13	3.1	74
2.2	3.1	2.7	26	3.5	142

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.1	21	18	13	15	16	26	94	11	36	43	33
2	7.4	*20	19	13	15	17	39	*76	20	36	45	32
3	5.2	20	19	14	16	17	41	56	20	32	88	39
4	5.2	20	16	15	17	17	45	47	14	33	91	40
5	*4.6	20	14	16	14	17	41	48	*20	32	78	39
6	4.8	20	*13	15	*14	17	*32	40	18	25	52	*37
7	4.6	23	13	16	14	17	36	32	24	28	45	37
8	3.3	21	14	17	14	*17	32	31	22	32	48	40
9	4.4	20	15	16	14	16	36	24	27	32	*52	51
10	8.4	18	14	*15	15	19	39	18	37	32	50	67
11	11	18	14	15	14	18	32	13	46	*26	52	55
12	12	18	14	15	14	18	30	13	50	24	59	47
13	13	20	14	15	14	20	33	13	59	28	55	39
14	15	20	14	15	15	26	26	13	47	28	51	39
15	17	21	14	15	16	27	21	12	54	26	50	39
16	18	20	13	16	16	32	21	8.8	45	23	64	47
17	18	20	12	16	15	33	29	5.2	47	19	100	42
18	25	20	14	16	15	31	41	4.8	67	18	80	54
19	25	20	15	16	15	26	74	5.0	54	*18	76	74
20	26	20	14	15	16	27	*140	2.6	73	18	70	63
21	25	20	14	15	16	27	117	*1.5	73	26	78	57
22	24	20	14	16	16	27	119	1.6	*74	20	61	63
23	22	20	15	17	16	28	119	2.0	60	19	52	77
24	21	22	15	17	14	32	94	2.0	57	21	50	63
25	22	20	15	17	15	28	59	3.0	54	19	57	52
26	21	19	15	16	15	24	60	1.5	47	20	51	46
27	20	18	15	16	14	23	77	2.8	54	21	45	42
28	21	18	14	15	15	22	110	6.6	39	20	39	40
29	21	17	13	15	-	21	134	7.0	34	20	37	40
30	20	18	13	16	-----	20	107	7.4	37	62	35	40
31	21	-----	14	15	-----	21	-----	5.2	-----	35	35	-----
Total	4 74.0	5 92	4 50	4 79	4 19	7 11	1 81 0	5 97 0	1 28 4	8 29	1 78 9	1 43 4
Mean	15.3	19.7	14.5	15.5	15.0	22.9	60.3	19.3	42.8	26.7	57.7	47.8
Ac-ft	940	1,170	893	950	851	1,410	3,590	1,180	2,550	1,640	3,550	2,840

Calendar year 1960: Max 217 Min 1.7 Mean 24.1 Ac-ft 17,500  
 Water year 1960-61: Max 140 Min 1.5 Mean 29.8 Ac-ft 21,540

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 10-12, Nov. 16 to Feb. 3, Feb. 5-8, 10, 15, 16, 18-25, Feb. 27 to Mar. 1, Mar. 8, 9 (no gage-height record Nov. 28 to Dec. 6, Jan. 6-10).

## GUNNISON RIVER BASIN

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9-1471. Cow Creek near Ridgway, Colo.

Location.--Lat 38°08'20", long 107°38'20", in N½ sec.21, T.45 N., R.7 W., on left bank 400 ft upstream from Cobbs Gulch and 6½ miles southeast of Ridgway.

Drainage area.--41.1 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,900 ft (from topographic map).

Average discharge.--6 years, 65.5 cfs (47,420 acre-ft per year).

Extremes.--Maximum discharge during year, 500 cfs June 9 (gage height, 4.70 ft); minimum daily, 4.0 cfs Mar. 8.  
1955-61: Maximum discharge, 1,360 cfs June 28, 1957 (gage height, 7.70 ft); minimum daily, 2.0 cfs Jan. 9, 1957.

Remarks.--Records fair except those for periods of ice effect, which are poor. No diversion above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 27-30. Apr. 1-3, Apr. 5-8, 10, 11, 13, 14)

Oct. 1 to June 9				June 10 to Sept. 30			
2.5	4.0	3.3	78	2.3	16	3.5	185
2.6	7.0	3.6	147	2.5	30	4.0	300
2.7	11	4.0	256	2.7	48	4.5	440
2.9	25	5.0	575	3.0	87		
3.1	47						

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.8	9.4	6	6	4.6	4.2	8.2	*104	378	119	28	22
2	11	*8.6	6.5	5.5	4.6	4.6	9.0	130	331	101	31	21
3	10	8.6	6.5	5.5	4.8	4.4	18	140	262	96	38	30
4	11	8.6	6	6	4.8	4.2	30	111	228	91	31	31
5	*10	8.2	6	6	4.4	4.2	30	73	248	84	31	48
6	9.4	8.6	6	6	*4.2	4.2	20	53	*262	76	29	*36
7	9.4	9.4	*6.5	6	4.2	4.2	18	43	286	72	25	32
8	9.0	9.0	6.5	6.5	4.4	*4.0	16	37	337	71	24	29
9	9.4	7.8	6.5	6.5	4.6	4.2	13	45	359	66	*22	42
10	12	8	6.5	*6.5	4.6	4.4	11	93	338	61	21	36
11	12	8	6	6	4.6	4.6	11	150	335	*58	44	31
12	10	8	6	6	4.8	5	11	157	312	54	56	29
13	9.8	8.5	6	6	4.6	5	12	121	278	49	32	26
14	10	8.5	6	5.5	4.6	5	9.8	78	290	47	28	27
15	9.4	8	6	6	4.4	5.5	11	68	275	46	29	28
16	10	7.5	6	6	4.6	6	13	68	242	42	34	28
17	12	7.5	6	6	4.8	6	21	82	250	40	32	25
18	13	7.5	6.5	6	4.8	6	34	123	240	37	44	38
19	15	8	6.5	5.5	4.6	6	47	194	240	36	32	41
20	13	7.5	6	5	4.2	6.5	*63	211	240	36	28	67
21	12	7.5	6	5.5	4.4	7	46	*231	228	36	30	53
22	11	8	6	5.5	4.4	*7	46	310	*213	31	27	64
23	9.8	8	6.5	5.5	4.4	7.5	51	325	199	30	26	101
24	9.8	8	6.5	5.5	4.2	8	42	307	191	28	27	74
25	9.8	7	6.5	5.5	4.4	7.5	23	334	171	27	40	61
26	9.8	7	6	5.5	4.6	7.5	19	334	155	28	24	56
27	9.8	6.5	6	5	4.2	8.2	19	340	133	26	21	55
28	9.8	6	6	4.6	4.4	7.4	34	356	127	26	21	56
29	9.0	6	5.5	4.6	-	7.4	61	365	123	26	21	55
30	7.8	6	5.5	4.8	-----	6.4	8.2	346	127	27	22	49
31	9	-----	6	4.8	-----	8	-----	359	-----	26	25	-----
Total	322.8	235.2	190.5	175.3	126.2	180.1	829.0	568.8	7,398	1,593	923	1,291
Mean	10.4	7.84	6.15	5.65	4.51	5.81	27.6	183	247	51.4	29.8	43.0
Ac-ft	640	467	378	348	250	357	1,640	11,280	14,670	3,160	1,830	2,560

Calendar year 1960: Max 550 Min 4.2 Mean 63.4 Ac-ft 46,020

Water year 1960-61: Max 378 Min 4.0 Mean 51.9 Ac-ft 37,580

Peak discharge (base, 500 cfs).--June 9 (7 p.m.) 500 cfs (4.70 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 31, Nov. 10 to Mar. 26, Mar. 31, Apr. 4, 9, 12, 15, 16 (no gage-height record Dec. 8 to Feb. 5, Mar. 7-22).

## GUNNISON RIVER BASIN

9-1475. Uncompahgre River at Colona, Colo.

Location.--Lat 38°19'50", long 107°46'40", in NW $\frac{1}{4}$  sec.17, T.47 N., R.8 W., on right bank 15 ft downstream from county highway bridge, a quarter of a mile north of Colona, and 1 mile upstream from Beaton Creek.

Drainage area.--437 sq mi.

Records available.--April 1903 to November 1905, April to June 1906 (gage heights and discharge measurements only), October 1912 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "near Colona" 1904-6, 1922-34.

Gage.--Water-stage recorder. Datum of gage is 6,318.80 ft above mean sea level, datum of 1929. Supplementary water-stage recorder on left bank at same datum. Prior to June 24, 1921, staff or chain gages and June 24, 1921, to Oct. 28, 1938, water-stage recorder, at several sites within 5 miles of present site at various datums. Oct. 29, 1938, to Aug. 2, 1949, water-stage recorder at present site at datum 3.00 ft higher and Aug. 3 to Sept. 30, 1949, at datum 1.00 ft higher.

Average discharge.--51 years (1903-5, 1912-61), 274 cfs (198,400 acre-ft per year).

Extremes.--Maximum discharge during year, 1,320 cfs June 9 (gage height, 4.52 ft); minimum daily, 26 cfs Oct. 7, 8.  
1903-5, 1912-61: Maximum daily discharge, 4,080 cfs June 13, 14, 1921; minimum daily, 12 cfs Sept. 19, 1956.

Remarks.--Records fair. Natural flow of stream affected by water diverted from West Fork Cimarron Creek, Mineral Creek (San Juan River basin), and Leopard Creek (Dolores River basin), diversions for irrigation of about 19,000 acres (part of which is below station), and return flow from irrigated areas.

Cooperation.--One discharge measurement furnished by Uncompahgre Valley Water Users Association.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 22 to Apr. 2, Apr. 17 to June 21)

Oct. 1 to June 21

June 22 to Sept. 30

1.4	22	2.6	320	3.0	110
1.6	35	3.0	505	3.4	230
1.8	70	3.5	810	3.8	440
2.2	175	3.9	1,150	4.2	740

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	100	95	75	*65	60	138	602	826	385	206	138
2	29	98	95	50	70	*66	135	638	834	362	206	128
3	29	*98	100	55	75	66	151	*650	734	338	310	177
4	29	90	105	55	72	68	202	626	626	315	320	192
5	29	88	78	65	72	68	236	*435	*722	300	332	189
6	*27	82	50	65	60	68	166	332	768	266	258	206
7	26	102	*54	65	60	64	163	236	882	254	212	174
8	26	102	75	65	60	58	160	199	*1,030	*270	*189	168
9	27	102	85	70	65	58	138	172	*1,150	258	186	216
10	32	98	85	*75	70	75	169	320	1,080	246	177	250
11	35	100	75	80	75	80	151	527	997	250	174	223
12	42	85	82	85	78	88	142	584	970	223	262	195
13	44	92	82	85	78	92	166	456	979	220	202	180
14	52	98	80	85	80	118	120	300	906	212	183	*174
15	60	100	78	85	82	151	88	226	914	206	168	174
16	60	85	70	90	82	157	90	202	858	192	195	183
17	72	92	62	90	88	169	120	219	803	*174	285	183
18	98	92	88	90	78	175	169	276	789	171	254	180
19	105	92	88	85	70	142	244	461	754	156	250	275
20	105	92	88	80	66	125	*415	626	754	153	209	305
21	98	95	80	80	68	130	396	532	716	159	238	285
22	98	92	95	80	72	130	340	*775	*676	162	192	300
23	98	90	88	80	78	145	440	803	573	132	165	404
24	100	95	85	85	60	*142	352	*716	559	132	159	380
25	100	95	88	85	72	160	205	*874	510	132	206	310
26	95	95	88	82	75	135	166	890	489	138	195	285
27	95	102	88	82	68	125	160	922	454	144	162	262
28	98	102	88	80	70	120	260	970	416	138	147	246
29	100	78	80	70	-	118	445	962	410	147	144	242
30	92	102	65	65	-----	120	538	866	404	209	135	223
31	95	-----	70	65	-----	122	-----	810	-----	209	138	-----
Total	2,025	2,834	2,530	2,349	2,009	3,395	6,665	17,207	22,583	6,654	6,459	6,847
Mean	65.3	94.5	81.6	75.8	71.8	110	222	555	753	215	208	228
Ac-ft	4,020	5,620	5,020	4,660	3,980	6,730	13,220	34,130	44,790	13,200	12,810	13,560

Calendar year 1960: Max 1,360 Min 26 Mean 230 Ac-ft 166,700  
Water year 1960-61: Max 1,150 Min 26 Mean 223 Ac-ft 161,800

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 29 to Jan. 24, Jan. 28 to Feb. 2, Feb. 6-9.



9-1495. Uncompahgre River at Delta, Colo.

Location.--Lat 38°45', long 108°05', in SW $\frac{1}{4}$  sec.13, T.15 S., R.96 W., on left bank 40 ft upstream from The Denver and Rio Grande Western Railroad Co. bridge at west edge of Delta and  $1\frac{1}{4}$  miles upstream from mouth.

Drainage area.--1,110 sq mi, approximately.

Records available.--April 1903 to October 1931 (no winter records in most years), September 1938 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "near Delta" 1907-24.

Gage.--Water-stage recorder. Datum of gage is 4,929.92 ft above mean sea level, datum of 1929. Prior to Oct. 31, 1923, staff gage at several sites a quarter to 2 miles upstream at various datums. Apr. 26, 1924, to Nov. 2, 1931, water-stage recorder at site 50 ft upstream at different datum. Sept. 1, 1938, to May 5, 1941, water-stage recorder at site 330 ft downstream at same datum. May 9, 1941, to Apr. 25, 1946, chain gage at site 250 ft downstream at same datum. Apr. 26, 1946, to Feb. 17, 1960, water-stage recorder at site 150 ft downstream at same datum.

Average discharge.--25 years (1907-8, 1920-21, 1938-61), 275 cfs (199,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,700 cfs Sept. 23 (gage height, 6.51 ft); minimum daily, 67 cfs Mar. 28.

1903-31, 1938-61: Maximum discharge recorded, 3,730 cfs May 5, 1941 (gage height, 5.90 ft, site and datum then in use), from rating curve extended above 1,900 cfs; no flow at times in 1908; minimum daily determined since beginning of diversion through Gunnison tunnel, 7 cfs July 10-15, 17, 21, 24-28, 1910.

Remarks.--Records fair. Natural flow of stream affected by water diverted from Gunnison River (see record of diversion with record for Gunnison River below Gunnison tunnel elsewhere in this report) and other adjacent basins, diversions for irrigation of about 90,000 acres above station, and return flow from irrigated areas.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 22 to June 24, July 16 to Aug. 3, Aug. 25 to Sept. 30)

3.2	55	4.3	425
3.5	110	5.0	830
3.8	190	6.0	1,600

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	230	414	181	140	*132	90	130	414	752	172	190	325
2	230	420	187	130	130	92	72	403	758	155	*184	360
3	246	*420	193	120	132	94	78	*414	596	163	175	957
4	254	420	210	130	135	96	90	386	567	152	320	1060
5	254	414	190	130	130	98	194	310	*365	*145	315	949
6	*246	408	152	130	125	100	187	194	376	140	258	998
7	246	436	*158	135	120	98	150	152	452	140	198	900
8	250	447	175	145	125	96	226	130	540	155	155	830
9	254	442	181	150	128	*94	226	118	*722	145	138	865
10	330	436	172	150	122	98	230	96	776	142	*140	1100
11	365	442	160	160	125	96	187	150	740	*142	148	1050
12	398	436	166	*160	135	96	218	290	398	148	169	1050
13	403	320	160	160	148	96	266	315	462	145	166	1070
14	464	218	160	160	138	96	254	280	584	140	145	935
15	562	202	150	155	130	120	184	158	638	142	138	872
16	590	198	140	150	135	152	115	112	574	184	152	656
17	608	210	145	140	135	155	108	108	474	*125	502	698
18	626	214	155	140	148	172	128	98	530	122	414	662
19	590	214	155	140	132	184	365	175	474	122	320	734
20	557	206	150	140	120	158	*540	355	508	125	295	837
21	552	206	140	130	104	148	632	315	535	132	262	949
22	562	202	140	120	98	138	408	425	*513	120	258	1070
23	552	202	140	130	*104	132	447	535	370	112	190	1490
24	530	194	140	130	108	138	464	*458	290	112	172	1440
25	442	194	140	130	98	140	222	325	285	106	198	1300
26	420	190	140	132	115	110	142	425	222	110	262	1170
27	458	187	140	140	100	104	102	568	175	110	206	*1030
28	436	181	140	130	104	67	96	734	163	118	187	1000
29	414	172	130	130	-	110	172	782	155	125	*169	*977
30	392	175	130	130	-----	*266	285	782	158	150	194	977
31	398	-----	130	130	-----	250	-----	740	-----	234	270	-----
Total	12,859	8,820	4,855	4,297	3,456	3,884	6,918	10,747	14,152	4,333	6,890	28,311
Mean	415	294	157	139	123	125	231	347	472	140	222	944
Ac-ft	25,310	17,490	9,630	8,520	6,850	7,700	13,720	21,320	28,070	8,590	13,670	56,150

Calendar year 1960: Max 1,040 Min 72 Mean 246 Ac-ft 179,000  
Water year 1960-61: Max 1,490 Min 67 Mean 300 Ac-ft 217,200

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 15-17, Jan. 13-24. No gage-height record Dec. 20 to Jan. 12, Jan. 28-30.

## GUNNISON RIVER BASIN

9-1520. Kahnah Creek near Whitewater, Colo.

Location.--Lat 38°59', long 108°14', in sec.34, T.12 S., R.97 W., on right bank at downstream side of private bridge, a quarter of a mile downstream from intake of pipeline for Grand Junction water supply and 12 miles east of Whitewater.

Drainage area.--55.0 sq mi.

Records available.--October 1917 to September 1921, September 1922 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder and concrete control. Prior to Sept. 30, 1932, staff gage and Sept. 30, 1932, to Oct. 14, 1935, water-stage recorder, at site 300 ft upstream at different datum.

Average discharge (combined flow).--43 years, 40.3 cfs (29,180 acre-ft per year).

Extremes (combined flow).--Maximum discharge during year, 419 cfs May 22; minimum daily, 5.9 cfs Nov. 29.

1917-21, 1922-61: Maximum discharge observed, 1,640 cfs June 6, 1921 (gage height, 4.5 ft, site and datum then in use), from rating curve extended above 700 cfs; minimum daily, 4.3 cfs Dec. 19, 1939.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for municipal supply of Grand Junction and by Raber ditch for irrigation of about 60 acres below station. Records of these diversions furnished by State engineer and monthly figures are adjusted to show total flow of stream. Regulation by a few small reservoirs above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1, 2)

0.3	0.5	0.6	5.5	1.1	45
.4	1.0	.7	9.5	1.4	100
.5	2.5	.9	24	2.0	285

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.5	1.8	1.0	0.2	0.1	0.1	2.0	15	145	27	7.9	14
2	2.5	1.6	1.0	.2	*.1	.2	2.5	*21	115	24	13	14
3	*3.1	1.6	1.0	.2	*.1	.2	3.0	22	86	26	13	15
4	2.5	1.4	.9	.1	.1	.3	*3.2	23	74	26	11	15
5	2.8	1.4	.7	.1	.1	.3	3.1	21	70	25	11	14
6	2.4	1.3	.7	.1	.1	.3	2.4	17	62	26	8.7	14
7	2.0	*2.5	*.8	.2	.1	.3	2.8	14	57	25	7.1	14
8	2.2	2.2	.8	.2	.1	.3	1.3	13	52	24	6.3	14
9	3.1	1.2	.8	*.1	.1	.3	.9	15	45	22	5.9	22
10	4.0	1.2	.8	.1	.1	.4	.8	22	39	30	9.5	18
11	4.6	1.4	.8	.1	.1	.4	.8	*39	37	33	11	12
12	4.0	1.4	.8	.1	.2	.4	.8	48	*33	33	12	10
13	4.9	1.4	.8	.2	.2	*.5	.9	60	31	35	11	9.5
14	6.3	1.4	.7	.2	.1	.7	.8	52	28	34	12	4.9
15	5.9	1.0	.6	.2	.1	.8	.8	52	27	33	13	2.7
16	5.5	.8	.5	.2	.2	.9	.8	58	23	32	14	5.2
17	4.3	1.0	.4	.2	.2	1.0	1.0	70	21	*32	13	5.2
18	3.7	1.2	.4	.2	.1	1.0	3.7	135	20	31	12	12
19	3.4	1.4	.4	.2	.1	.9	4.3	*184	20	24	11	11
20	3.1	1.4	.4	.2	.1	.8	5.9	171	20	21	10	8.7
21	3.1	1.2	.4	.2	.1	.8	4.9	187	19	20	5.5	7.9
22	2.8	1.0	.4	.2	.1	.7	5.5	264	18	18	3.7	8.7
23	2.5	.9	.4	.2	.1	.7	8.3	278	16	20	3.1	11
24	2.4	.9	.4	.2	*.1	.8	*5.5	*243	15	20	6.3	15
25	2.4	.8	.4	.2	.1	.9	3.7	226	15	19	13	13
26	2.2	1.0	.4	.1	.1	1.0	2.8	218	23	19	12	13
27	2.2	1.0	.4	.1	.1	1.0	3.1	201	*26	11	11	13
28	2.4	.9	.3	.1	.1	1.0	6.7	177	27	8.3	13	14
29	2.4	.7	.3	.1		1.2	11	*159	27	8.3	14	17
30	1.9	.9	.2	.1		1.4	15	142	28	11	16	15
31	2.2		.2	.1		1.6		138		8.7	*14	
Total	99.3	37.9	18.1	4.9	3.2	21.2	108.3	3287	1219	726.3	324.0	363.8
Mean	3.20	1.26	0.58	0.16	0.11	0.68	3.61	106	40.6	23.4	10.5	12.1
Ac-ft	197	75	36	9.7	6.3	42	215	6,520	2,420	1,440	643	722

Adjusted for diversions

Mean Cfs	11.7	8.58	7.94	6.47	6.62	7.58	11.0	116	49.5	34.4	18.8	19.6
In.												
Ac-ft	722	511	488	398	368	466	658	7,160	2,950	2,120	1,120	1,170

Observed

Calendar year 1960: Max	278	Min	0.1	Mean	21.6	Ac-ft	15,670
Water year 1960-61: Max	278	Min	0.1	Mean	17.0	Ac-ft	12,330

Adjusted

Calendar year 1960: Mean	30.3	Ac-ft	21,980
Water year 1960-61: Mean	25.1	Ac-ft	18,160

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9-12, 16-24, Nov. 28 to Dec. 6. No gage-height record Dec. 7 to Apr. 4 (stage-discharge relation affected by ice during most of period).

9-1525. Gunnison River near Grand Junction, Colo.

Location.--Lat 38°59', long 108°27', near center of sec.14, T.2 S., R.1 E., Ute meridian, on right bank 180 ft upstream from bridge on State Highway 141, 0.4 mile downstream from Whitewater Creek, 0.5 mile south of Whitewater, and 8 miles southeast of Grand Junction.

Drainage area.--7,870 sq mi, approximately.

Records available.--October 1894 to December 1895 (gage heights only), October 1896 to September 1899, October 1901 to October 1906, October 1916 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "at Whitewater" 1901-6.

Gage.--Water-stage recorder. Datum of gage is 4,628.12 ft above mean sea level, datum of 1929. Prior to Apr. 11, 1895, staff gage 13 miles downstream near mouth at different datum. Apr. 11, 1895, to July 6, 1901, and Apr. 10, 1902, to October 1906 staff or chain gage at present site at datum 1.04 ft lower. Apr. 1, 1917, to June 24, 1934, staff gage and June 25, 1934, to Sept. 30, 1959, water-stage recorder, at site 11½ miles downstream at datum 72.98 ft lower.

Average discharge.--53 years (1896-99, 1901-6, 1916-61), 2,624 cfs (1,900,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,830 cfs May 29 (gage height, 6.98 ft); minimum daily, 356 cfs July 15.

1896-99, 1901-6, 1916-61: Maximum discharge observed, 35,700 cfs May 23, 1920 (gage height, 14.95 ft, site and datum then in use), from rating curve extended above 22,000 cfs; minimum daily, 106 cfs July 20, 1934.

Remarks.--Records good except those for period of ice effect, which are poor. Records show flow that enters Colorado River from Gunnison River basin except for about 40 cfs diverted below gage during irrigation season. Natural flow of river affected by diversions for irrigation of about 233,000 acres above station, storage reservoirs, and return flow from irrigated lands.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 9-26, May 3, 4, May 24 to July 13, Aug. 3 to Sept. 30)

2.6	320	4.0	1,760	6.0	5,160
2.7	380	5.0	3,190	7.0	7,620
3.0	600				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	513	972	*780	680	740	700	936	2,330	6,700	627	924	867
2	492	960	912	640	*780	663	912	3,160	6,550	690	823	867
3	485	996	912	580	780	690	912	*3,830	5,980	663	801	1,190
4	478	972	972	540	760	740	*1,040	4,150	4,870	645	1,030	1,960
5	499	996	1,090	540	760	760	1,270	3,930	4,130	636	1,060	1,820
6	513	984	972	540	700	750	1,530	3,050	3,800	618	834	1,730
7	*520	*984	700	600	660	750	1,330	2,440	3,850	552	700	1,580
8	528	1,040	690	700	680	710	1,320	2,080	4,070	700	*568	1,430
9	544	1,080	780	*750	690	672	1,260	1,720	4,470	878	471	1,500
10	576	1,040	960	760	672	654	1,030	1,700	5,050	812	485	1,540
11	654	972	1,000	780	663	663	972	*2,640	5,280	663	506	1,560
12	740	936	980	800	690	710	912	4,240	*5,620	576	536	1,580
13	770	960	940	720	710	*720	770	4,980	4,680	457	618	1,550
14	801	1,030	860	680	710	730	812	4,240	4,240	394	663	1,380
15	960	996	800	660	700	750	812	3,110	4,010	356	600	1,270
16	1,020	1,020	760	680	700	889	654	2,580	3,810	374	618	1,190
17	1,010	948	680	700	720	1,140	552	2,540	3,490	443	710	1,260
18	1,020	856	720	720	770	1,250	520	2,800	3,250	485	1,070	1,430
19	1,070	936	760	720	760	1,210	720	3,490	3,110	*4,57	856	1,440
20	1,090	972	820	700	710	1,100	1,220	4,740	2,790	513	740	1,420
21	1,080	1,010	820	640	690	1,040	1,960	5,070	2,620	544	672	1,550
22	1,070	1,010	800	620	690	1,060	1,890	5,140	2,400	544	576	1,600
23	1,060	984	800	620	710	984	1,700	5,980	2,120	492	536	2,330
24	1,040	960	840	640	*710	1,080	1,930	6,450	1,770	485	496	3,020
25	996	924	840	660	700	1,240	1,760	6,150	1,540	408	831	2,740
26	1,010	960	800	640	663	1,240	*1,160	6,380	1,430	362	720	2,400
27	1,010	1,010	800	680	681	1,080	823	6,850	*1,180	387	845	2,190
28	996	1,030	780	720	700	1,020	654	6,900	960	457	823	2,050
29	984	996	740	700	-	878	760	*7,390	780	560	720	*1,990
30	1,010	856	720	700	-----	856	1,460	7,150	663	645	663	1,980
31	996	-----	720	720	-----	867	-----	7,100	-----	760	*750	-----
Total	25,535	29,390	25,748	20,830	19,899	27,596	33,581	134,310	105,213	17,183	22,245	50,414
Mean	824	980	831	672	711	890	1,119	4,333	3,507	554	718	1,680
Ac-ft	90,650	58,290	51,070	41,320	39,470	54,740	66,610	266,400	208,700	34,080	44,120	99,990

Calendar year 1960: Max 8,990 Min 394 Mean 1,834 Ac-ft 1,332,000  
Water year 1960-61: Max 7,390 Min 356 Mean 1,403 Ac-ft 1,015,000

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 7 to Feb. 8.

## COLORADO RIVER MAIN STEM

9-1635. Colorado River near Colorado-Utah State line

Location.--Lat 39°09', long 108°57', in sec.25, T.10 S., R.104 W., on right bank 4.8 miles downstream from Salt Creek, 6½ miles southwest of Mack, Colo., and 7¼ miles upstream from Colorado-Utah State line.

Drainage area.--17,900 sq mi, approximately.

Records available.--May 1951 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,370 ft (from river-profile map).

Average discharge.--10 years, 5,711 cfs (4,135,000 acre-ft per year).

Extremes.--Maximum discharge during year, 19,300 cfs May 31 (gage height, 9.18 ft); minimum daily, 1,340 cfs Aug. 10.  
1951-61: Maximum discharge, 56,800 cfs June 9, 1957 (gage height, 16.40 ft); minimum daily, 960 cfs Sept. 7, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Natural flow of stream affected by transmountain diversions, storage reservoirs, power developments, and diversions for irrigation. (Records include all return flow from irrigated areas.)

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

2.6	1,120	5.0	5,140
3.0	1,570	7.0	11,000
4.0	3,060	10	23,300

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.980	2.800	2.300	2.150	2.440	2.190	2.320	2.990	1.8300	3.040	1.960	2.410
2	1.960	2.990	2.460	2.130	2.560	2.230	2.260	4.200	1.8100	3.110	2.200	2.340
3	1.900	2.920	2.660	2.190	2.540	2.360	*2.240	5.620	1.7000	2.920	2.460	2.730
4	1.880	3.010	2.900	1.950	2.540	2.400	2.340	6.910	1.4300	2.740	2.810	3.590
5	1.850	2.850	3.100	1.910	2.480	2.380	2.430	7.570	1.1900	2.660	2.850	4.140
6	1.870	2.930	3.040	1.850	2.480	2.380	2.860	6.670	1.0800	2.430	2.350	4.200
7	1.920	2.990	2.490	2.000	2.460	2.380	3.130	5.330	1.0800	2.290	2.120	4.160
8	1.880	3.100	2.290	2.200	*2.410	2.280	3.240	4.540	1.1100	2.240	1.730	4.160
9	1.980	*3.100	2.260	2.400	2.480	2.190	3.150	3.790	1.2200	2.340	1.500	6.320
10	2.080	3.040	2.610	2.500	2.380	*2.150	2.880	3.320	1.4100	2.380	1.340	4.740
11	2.260	2.900	2.900	2.600	2.320	2.100	2.610	3.710	1.5100	2.160	*1.500	5.120
12	2.340	2.810	2.950	2.600	2.220	2.200	2.460	6.200	1.4100	1.950	1.500	4.830
13	*2.380	2.780	2.730	2.400	2.240	2.400	2.290	9.400	1.3600	1.780	1.520	4.410
14	2.520	2.920	2.540	2.300	2.260	2.220	2.230	9.940	*1.2200	1.590	1.580	3.850
15	2.760	2.900	2.510	2.300	2.160	2.260	2.340	*7.930	1.1000	1.490	1.590	3.630
16	2.850	2.850	2.340	*2.400	2.160	2.410	2.320	6.340	1.0400	1.420	1.640	3.350
17	2.920	2.900	2.060	2.400	2.400	2.760	2.090	5.740	9.850	1.450	1.760	3.340
18	2.880	2.740	1.980	2.520	2.430	2.990	1.880	6.000	9.340	*1.590	1.960	3.850
19	2.780	2.710	2.340	2.510	2.510	3.130	1.700	6.880	8.830	1.570	2.090	4.260
20	2.860	2.850	2.610	2.490	2.380	2.860	1.950	9.110	8.170	1.550	1.960	4.110
21	2.950	3.040	2.690	2.400	2.430	2.800	2.850	11.300	7.970	1.610	1.900	4.300
22	2.930	2.830	2.690	2.280	2.430	2.620	3.750	11.100	7.630	1.630	1.760	5.090
23	2.850	2.730	2.760	2.230	2.430	2.640	3.350	11.300	6.790	1.690	1.650	6.880
24	2.810	2.800	2.830	2.260	2.380	2.740	3.430	1.5100	5.900	1.860	1.590	7.630
25	2.740	2.780	2.690	2.480	2.350	2.780	*3.490	1.5200	5.330	1.880	2.020	7.360
26	2.760	2.740	2.560	2.490	2.240	2.800	3.040	1.4900	*4.920	1.640	2.220	6.220
27	2.690	2.760	2.540	2.570	2.340	2.920	2.410	1.6000	4.450	1.530	2.230	5.820
28	2.640	*2.760	2.520	2.460	2.280	2.880	1.980	1.7000	3.890	1.420	2.300	*5.820
29	2.850	2.850	2.410	2.490	-	2.540	1.760	*1.8100	3.610	1.460	2.290	5.940
30	2.830	2.590	2.340	2.340	-----	2.380	1.990	1.7400	3.340	1.590	*2.260	5.220
31	2.990	-----	2.130	2.360	-----	2.320	-----	1.8700	-----	1.820	2.380	-----
Total	7 6890	8 5970	7 9330	7 2160	6 6730	7 7690	7 6770	28 8290	30 4920	6 0830	6 1020	14 0820
Mean	2,480	2,866	2,559	2,328	2,383	2,506	2,559	9,300	10,160	1,962	1,968	4,694
Ac-ft	152,500	170,500	157,300	143,100	132,400	154,100	152,300	571,800	604,800	120,700	121,000	279,300

Calendar year 1960: Max 23,600 Min 1,190 Mean 5,029 Ac-ft 3,651,000  
Water year 1960-61: Max 18,700 Min 1,340 Mean 3,812 Ac-ft 2,760,000

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 6-12. Stage-discharge relation affected by ice Jan. 13-17.



9-1650. Dolores River below Rico, Colo.

Location.--Lat 37°38'25", long 108°03'05", in SW $\frac{1}{4}$  sec.15, T.39 N., R.11 W., on left bank at upstream side of bridge on State Highway 145, at Dolores-Montezuma County line, half a mile upstream from Ryman Creek, and 4 miles southwest of Rico.

Drainage area.--105 sq mi.

Records available.--October 1951 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 8,422.23 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 132 cfs (95,560 acre-ft per year).

Extremes.--Maximum discharge during year, 1,020 cfs May 19 (gage height, 4.85 ft); minimum daily, 7 cfs Feb. 6, 7.  
1951-61: Maximum discharge, 2,120 cfs June 10, 1952 (gage height, 6.15 ft); minimum daily, 7.0 cfs Nov. 16, 17, 1956, Feb. 6, 7, 1961.  
Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 19 to June 3, July 9 to Aug. 5)

1.9	12	3.5	270
2.2	33	4.0	460
2.5	65	4.5	710
3.0	140	4.7	840

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	24	28	11	8	8.5	36	456	798	109	42	45
2	27	23	28	11	8	8.5	38	540	777	101	59	41
3	*25	24	30	9.5	8	10	40	560	615	95	88	49
4	22	22	24	10	8	10	55	452	472	98	89	51
5	21	22	20	10	7.5	11	80	300	480	88	65	54
6	19	23	15	10	7	*11	75	228	476	81	65	58
7	19	22	19	10	*7	12	75	190	500	84	50	50
8	19	20	18	11	7.5	13	60	168	550	84	44	45
9	26	18	19	10	8	14	52	185	*545	72	42	86
10	43	18	16	11	8	14	48	273	520	66	40	85
11	63	18	14	10	8	15	42	436	505	60	41	68
12	42	18	16	10	8.5	16	*44	*560	488	57	*60	*58
13	33	19	14	10	8.5	17	50	444	448	*53	46	51
14	31	18	14	10	8.5	20	43	316	408	*51	42	46
15	31	17	14	11	8	24	40	288	380	48	40	48
16	35	18	11	11	8.5	26	42	356	328	49	58	51
17	39	18	13	10	9	28	68	460	304	45	82	44
18	39	18	12	10	8.5	28	98	605	294	43	75	81
19	34	18	11	9	7.5	28	113	734	*279	41	70	106
20	35	18	11	9.5	8	26	144	722	270	45	66	95
21	33	17	11	9	8.5	30	154	740	246	46	69	92
22	33	16	11	9	8	34	162	746	219	39	52	126
23	33	16	12	9.5	8.5	36	213	680	195	38	49	168
24	34	16	11	10	8	38	202	645	178	37	61	140
25	32	16	10	10	8.5	40	*142	*630	165	38	58	115
26	32	15	10	9	10	36	120	698	152	40	61	106
27	*32	15	11	9	8.5	36	117	770	140	43	51	96
28	32	20	10	8	9	36	144	798	132	38	43	94
29	27	*26	*10	7.5	-	38	249	805	121	38	45	88
30	22	28	10	7.5	-	38	364	740	113	50	54	79
31	24	-----	10	8	-----	34	-----	805	-----	41	49	-----
Total	957	581	463	300.5	229.0	736.0	311.0	16,330	11,098	1,818	1,756	2,316
Mean	30.9	19.4	14.9	9.69	8.18	23.7	104	527	370	58.6	56.6	77.2
Ac-ft	1,900	1,150	918	596	454	1,460	6,170	32,390	22,010	3,610	3,480	4,590

Calendar year 1960: Max 973 Min 10 Mean 130 Ac-ft 94,370

Water year 1960-61: Max 805 Min 7 Mean 109 Ac-ft 78,730

Peak discharge (base, 800 cfs)--May 19 (4 p.m.) 1,020 cfs (4.85 ft); June 2 (4 a.m.) 994 cfs (4.81 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7 to Apr. 6 (no gage-height record Dec. 29 to Mar. 5), Apr. 15, 16.

## DOLORES RIVER BASIN

9-1665. Dolores River at Dolores, Colo.

Location.--Lat 37°28', long 108°30', in sec.16, T.37 N., R.15 W., on left bank 70 ft downstream from bridge on State Highway 184 in Dolores and a quarter of a mile upstream from Lost Canyon Creek.

Drainage area.--556 sq mi.

Records available.--June 1895 to October 1903, August 1910 to November 1912, October 1921 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,918.74 ft above mean sea level, datum of 1929. June 23, 1895, to Oct. 31, 1903, staff gage at site a quarter of a mile upstream at different datum. Aug. 27, 1910, to Nov. 30, 1912, and Apr. 11, 1922, to Mar. 26, 1934, chain gage, staff gage, or water-stage recorder on downstream side of bridge 70 ft upstream at different datums. Mar. 27, 1934, to Oct. 7, 1952, water-stage recorder at site 340 ft upstream at datum 6.17 ft higher.

Average discharge.--50 years, 440 cfs (318,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,520 cfs May 22 (gage height, 7.90 ft); minimum daily, 30 cfs Feb. 25 to Mar. 1, Mar. 4, 5, 1895-1903, 1910-12, 1921-61: Maximum discharge, 10,000 cfs Oct. 5, 1911 (gage height, 10.2 ft, site and datum then in use), from rating curve extended above 2,800 cfs; minimum daily, 8 cfs Aug. 16, 1896.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,000 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.0	30	4.5	310
3.3	55	5.0	550
3.6	90	6.0	1,150
4.0	160	8.0	2,600

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	63	46	34	34	30	93	1,560	1,900	268	189	164
2	45	*63	50	34	34	32	102	*1,790	1,830	240	258	150
3	54	60	54	32	34	32	154	1,890	1,480	234	275	150
4	*52	60	51	34	34	30	268	1,650	1,140	258	310	164
5	46	60	44	34	34	30	330	1,160	1,120	228	250	162
6	42	63	38	36	32	*32	275	914	1,100	195	213	*162
7	40	82	40	36	32	32	342	788	1,120	195	174	154
8	39	85	42	36	32	32	286	688	*1,170	201	174	146
9	51	72	44	36	34	32	228	752	1,240	176	*160	210
10	82	57	42	36	*36	34	244	914	1,220	*166	154	289
11	131	51	40	36	34	36	195	1,180	1,180	152	152	198
12	125	52	40	*36	32	40	198	1,660	1,200	135	210	156
13	90	54	42	36	32	40	261	1,610	1,070	135	192	135
14	78	57	40	36	34	44	222	1,080	968	140	172	120
15	80	57	38	34	34	48	186	968	938	160	166	117
16	84	*39	38	34	34	54	244	932	836	164	174	133
17	98	39	36	36	34	70	*350	1,140	764	170	300	140
18	120	48	36	36	34	84	505	*1,450	746	174	296	158
19	105	51	36	36	34	100	600	1,880	699	168	303	360
20	90	54	38	36	32	92	836	2,050	*660	176	216	296
21	86	45	34	36	32	94	914	1,830	622	225	189	275
22	81	45	36	34	32	*107	884	2,120	570	204	160	334
23	80	43	*36	34	32	135	1,040	1,880	515	210	*138	485
24	78	46	36	34	32	164	1,010	1,750	460	225	178	460
25	78	49	36	34	30	154	682	1,630	430	216	201	350
26	75	50	34	34	30	120	550	1,740	370	189	198	300
27	76	51	34	34	30	105	520	1,960	338	204	148	*261
28	77	40	38	34	30	100	666	2,120	314	216	126	231
29	80	40	36	32	-	96	962	2,090	278	198	135	213
30	66	42	36	32	-----	90	1,300	1,850	275	219	166	192
31	58	-----	34	34	-----	81	-----	1,910	-----	198	176	-----
Total	2,330	1,618	1,225	1,076	918	2,170	14,447	46,936	26,553	6,039	6,153	6,670
Mean	75.2	53.9	39.5	34.7	32.8	70.0	482	1,514	885	195	198	222
Ac-ft	4,620	3,210	2,430	2,130	1,820	4,300	28,660	93,100	52,670	11,980	12,200	13,230

Calendar year 1960: Max 2,770 Min 20 Mean 388 Ac-ft 282,000  
 Water year 1960-61: Max 2,120 Min 30 Mean 318 Ac-ft 230,400

Peak discharge (base, 1,800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-3	2a.m.	7.69	2,350	5-29	3a.m.	7.75	2,400
5-13	2:30a.m.	7.17	1,970	6-1	2a.m.	7.55	2,240
5-22	2a.m.	7.90	2,520				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 28 to Dec. 2, Dec. 5 to Mar. 21 (no gage-height record Jan. 21 to Feb. 18).

9-1681. Disappointment Creek near Dove Creek, Colo.

Location.--Lat 37°52', long 108°35', in SE $\frac{1}{4}$  sec. 25, T.42 N., R.16 W., a quarter of a mile downstream from ford,  $\frac{6}{8}$  miles southeast of Cedar, and 19 miles northeast of town of Dove Creek.

Drainage area.--145 sq mi, approximately.

Records available.--August 1957 to September 1961.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 872 cfs Aug. 18 (gage height, 7.75 ft), from rating curve extended above 250 cfs as explained below; no flow for several days.

1957-61: Maximum discharge, 1,770 cfs Aug. 4, 1959 (gage height, 10.30 ft), from rating curve extended above 250 cfs on basis of slope-area measurements at gage heights 7.55 and 10.30 ft; no flow for several days in 1959-61.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Several small reservoirs and ponds above station. Small diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	*0				0.2	9.9	30	36	0.6	20	15
2	0	0				.4	10	34	33	.5	50	20
3	0	0				.6	28	36	30	.6	80	10
4	*0	0				.8	42	38	24	.5	20	8
5	0	0	(*)			1	37	42	22	.3	10	7
6	0	0				1.5	17	*45	22	.1	8	5
7	0	5.8				*2	31	38	20	.1	6	10
8	0	5				2	30	35	19	.2	5	*30
9	9.4	4				5	22	29	*18	.1	4	39
10	9.1	3			(*)	17	28	29	17	.1	3	177
11	3.4	2				48	20	45	16	.1	2	4.1
12	5					3.4	*14	75	14	0	*2	2.7
13	3					48	18	80	12	*0	.8	2.4
14	4					69	13	53	10	0	.4	2.2
15	3					82	6.8	44	8.8	0	.6	2.2
16	3		0.6	0.3	0.1	41	5.9	34	8.3	0	2.3	2.2
17	3					27	13	37	7.0	0	11	2.2
18	7.7					26	19	53	6.1	0	122	7.9
19	3					12	22	74	*5.0	0	3.1	8.8
20	2	1				11	26	78	3.4	3.3	1.8	11
21	1					15	24	64	3.0	5	1.4	10
22	0					18	24	64	2.0	3	1.1	10
23	0					28	22	56	1.8	2	126	10
24	0					38	20	48	1.7	1	5	7
25	0					26	18	*44	1.5	1	15	4
26	0					11	16	42	1.4	1	10	3
27	0					10	18	48	1.2	1	5	3
28	0					9.7	20	52	1.0	3	4	2.5
29	0					10	24	52	.8	12	3	2.5
30	0					10	28	44	.7	15	8	2.5
31	0					8.5		39		10	10	
Total	87.2	39.8	18.6	9.3	2.8	612.7	626.6	1,482	346.7	90.2	540.5	421.2
Mean	2.81	1.33	0.6	0.3	0.1	19.8	20.9	47.8	11.6	2.91	17.4	14.0
Ac-ft	173	79	37	18	5.6	1,220	1,240	2,940	688	179	1,070	835

Calendar year 1960: Max 132 Min 0 Mean 14.6 Ac-ft 10,590  
 Water year 1960-61: Max 177 Min 0 Mean 11.7 Ac-ft 8,480

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-2	10p.m.	5.90	515	8-23	7p.m.	7.40	790
8-3	6:30p.m.	7.60	835	9-10	1a.m.	6.65	640
8-18	4p.m.	7.75	872				

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Oct. 12-17, 19-21, Nov. 8 to Mar. 9 (stage-discharge relation affected by ice most of period), Apr. 19 to May 5, July 21-29, 31, Aug. 1, 4-12, 24, Aug. 26 to Sept. 8, Sept. 21-30.

## DOLORES RIVER BASIN

9-1712. San Miguel River near Telluride, Colo.

Location.--Lat 37°56'55", long 107°52'35", in NW<sup>1</sup> sec.33, T.43 N., R.9 W., on left bank 0.1 mile upstream from Remine Creek, 0.3 mile downstream from bridge on State Highway 145, 0.5 mile downstream from Prospect Creek, 1.6 miles upstream from South Fork, and 3.5 miles west of Telluride.

Drainage area.--42.8 sq mi.

Records available.--October 1959 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 8,622.81 ft above mean sea level (levels by Bureau of Reclamation).

Extremes.--Maximum discharge during year, 526 cfs May 27 (gage height, 4.82 ft); minimum daily, 12 cfs Mar. 8.  
1959-61: Maximum discharge, 605 cfs June 17, 1960 (gage height, 5.01 ft); minimum daily, that of Mar. 8, 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Several small diversions for irrigation of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	17	3.5	190
2.2	25	4.0	310
2.5	48	4.5	445
3.0	110		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	*24	20	16	16	14	22	76	400	128	46	37
2	27	24	20	14	16	16	22	99	372	116	77	37
3	26	24	20	14	18	16	24	120	302	114	107	41
4	*25	24	18	16	18	14	31	114	235	112	102	40
5	24	24	16	16	16	14	33	100	248	103	83	40
6	24	24	*16	16	14	*14	*33	78	260	97	69	44
7	24	24	20	16	*14	14	30	*66	*272	95	60	*45
8	24	24	20	16	16	12	24	59	320	95	58	47
9	25	24	20	*16	18	14	22	56	368	92	50	67
10	26	22	20	16	18	16	24	70	*338	87	47	70
11	27	22	18	16	20	18	24	99	348	81	*48	59
12	26	22	19	16	20	20	22	128	360	*75	69	50
13	24	22	18	16	18	21	24	120	330	69	57	45
14	23	22	18	16	18	22	22	96	310	64	50	43
15	22	22	18	18	18	22	20	84	310	60	46	41
16	24	22	16	18	18	22	20	78	280	58	50	39
17	24	20	18	16	16	23	26	81	270	54	56	37
18	25	20	18	16	16	22	30	104	280	49	50	50
19	25	21	18	16	14	22	41	144	280	50	48	63
20	24	21	16	16	16	22	57	160	300	51	46	66
21	22	21	16	14	16	22	48	167	*285	50	44	60
22	22	21	18	14	16	24	51	*238	242	45	41	61
23	23	21	18	16	16	24	50	258	204	44	40	76
24	23	21	18	16	14	24	43	252	192	42	43	67
25	24	21	18	18	16	22	38	300	180	41	51	61
26	24	21	16	18	16	20	38	342	170	43	46	58
27	23	21	16	18	14	22	38	391	155	42	42	56
28	24	21	16	16	14	22	43	433	136	41	40	57
29	23	20	16	14	-	22	52	400	134	40	39	56
30	22	20	16	16	-----	21	64	378	132	39	39	52
31	22	-----	16	16	-----	22	-----	368	-----	38	37	-----
Total	746	660	551	496	460	603	1016	5459	8013	2115	1681	1565
Mean	24.1	22.0	17.8	16.0	16.4	19.5	33.9	176	267	68.2	54.2	52.2
Ac-ft	1,480	1,310	1,090	984	912	1,200	2,020	10,830	15,890	4,200	3,330	3,100

Calendar year 1960: Max 502 Min 13 Mean 66.6 Ac-ft 48,380  
Water year 1960-61: Max 433 Min 12 Mean 64.0 Ac-ft 46,350

Peak discharge (base, 500 cfs).--May 27 (10:30 p.m.) 526 cfs (4.82 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7, 16-18, 29, Dec. 1, 4-6, 11, Dec. 13 to Mar. 11, Mar. 26, Apr. 8, 9, 12, 15, 16. No gage-height record Jan. 24-29, Feb. 3-6, Feb. 8 to Mar. 6, June 12-20.



## DOLORES RIVER BASIN

261

9-1721. Leopard Creek at Noel, Colo.

Location.--Lat 38°06'10", long 107°55'10", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.36, T.45 N., R.10 W., on right bank 10 ft downstream from abandoned railroad, 0.6 mile west of Noel, and 2 miles upstream from Dead Horse Canyon.

Drainage area.--9.11 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,700 ft (from topographic map).

Average discharge.--6 years, 2.96 cfs (2,140 acre-ft per year).

Extremes.--Maximum discharge during year, 100 cfs Apr. 30 (gage height, 3.98 ft); minimum daily, 0.4 cfs for many days.  
1955-61: Maximum discharge, that of Apr. 30, 1961; minimum daily, 0.1 cfs for many days in 1956-57, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One diversion above station to Dallas Creek drainage. Small diversions for irrigation of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 30 to May 3)

2.1	0.4	2.7	12
2.2	1.1	3.0	28
2.3	2.2	3.5	72
2.5	6.2		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	*0.7	1.8	0.6	0.6	0.5	0.8	52	2.1	2.0	1.3	1.0
2	.4	.5	1.0	.6	.6	.5	.9	47	2.6	2.0	2.9	.8
3	.8	.5	1.0	.6	.7	.5	1.6	*34	2.9	2.4	2.9	1.5
4	*.5	.5	1.0	.7	.7	.5	2.6	22	2.6	1.6	2.7	1.2
5	.4	.5	1.0	.7	.6	.5	*2.9	18	2.6	1.4	1.8	1.2
6	.4	.5	*.9	.7	.6	.5	2.7	14	2.4	1.2	1.3	1.2
7	.5	.7	.8	.6	*.7	.5	2.4	11	*3.3	1.1	1.0	*1.3
8	.4	.6	.8	.6	.7	*.5	2.2	11	4.0	1.0	1.0	1.3
9	.4	.6	.8	*.6	.7	.5	2.2	10	3.3	.8	.8	2.0
10	.8	.5	.8	.5	.7	.6	1.4	12	2.7	.7	*.9	2.4
11	.8	.4	.7	.5	.7	.6	1.1	13	2.2	.6	1.0	1.8
12	.5	.5	.6	.5	.7	.5	1.2	12	2.1	*.6	1.0	2.0
13	.4	.6	.6	.5	.7	.6	1.3	11	2.2	1.0	.7	2.9
14	.5	.6	.5	.5	.7	.7	1.1	12	2.1	1.0	.7	2.2
15	.7	.6	.5	.5	.7	.8	1.0	8.7	2.6	1.0	.8	1.9
16	.8	.6	.5	.5	.7	.8	1.2	7.9	2.6	1.2	1.2	1.8
17	1.0	.7	.5	.5	.7	.8	1.5	7.9	2.6	1.1	1.2	1.9
18	1.0	.6	.5	.6	.6	.8	3.6	7.3	2.7	1.0	1.1	2.0
19	1.4	.7	.5	.5	.6	.8	8.7	7.0	2.2	.9	.9	2.2
20	1.0	.7	.5	.5	.5	.8	*18	6.8	2.6	1.0	.8	2.4
21	.9	.8	.5	.5	.5	.8	22	6.0	*2.6	1.2	.6	2.0
22	.9	.9	.5	.5	.5	.9	29	*5.3	3.3	1.0	.6	2.2
23	1.0	1.0	.5	.5	.6	1.2	35	5.1	2.9	.8	.8	3.6
24	.9	1.0	.5	.6	.5	1.3	26	4.9	2.4	.8	1.0	2.4
25	.8	1.0	.5	.6	.5	1.2	18	4.2	2.7	.8	1.2	2.2
26	.7	1.0	.5	.5	.6	1.0	16	4.0	2.7	.8	.9	2.2
27	.7	.9	.5	.5	.6	.8	20	3.3	2.7	.8	.7	2.2
28	.8	.8	.6	.5	.6	.8	35	3.1	2.2	.8	.8	2.1
29	.8	.9	.6	.5	-	.8	48	2.7	2.1	.9	.8	2.1
30	.7	1.0	.6	.6	-----	.8	58	2.6	2.2	.9	.9	2.1
31	.8	-----	.6	.6	-----	.8	-----	2.2	-----	4.6	1.2	-----
Total	22.1	20.9	21.2	17.2	17.6	22.7	365.4	368.0	78.2	37.0	35.5	58.1
Mean	0.71	0.70	0.68	0.55	0.63	0.73	12.2	11.9	2.61	1.19	1.15	1.94
Ac-ft	44	41	42	34	35	45	725	730	155	73	70	115

Calendar year 1960: Max 41 Min 0.2 Mean 2.68 Ac-ft 1,940  
Water year 1960-61: Max 58 Min 0.4 Mean 2.91 Ac-ft 2,110

Peak discharge (base, 15 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-22	6p.m.	3.27	46	7-31	3p.m.	3.20	43
4-30	5:30p.m.	3.98	100				

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 7-9, Jan. 25 to Feb. 6, Mar. 6-8, 16-21, (stage-discharge relation affected by ice during part of periods). Stage-discharge relation affected by ice Nov. 11, Nov. 13 to Dec. 4, Jan. 21-24, Mar. 14, 15, Apr. 9, 12, 15, 16.

9-1725. San Miguel River near Placerville, Colo.

Location.--Lat 38°02'05", long 108°07'15", in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.30, T.44 N., R.11 W., on right bank 0.7 mile downstream from Specie Creek and 4 miles northwest of Placerville.

Drainage area.--308 sq mi.

Records available.--January to December 1909, September 1910 to December 1912, April 1930 to September 1934, April 1942 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "at Placerville" 1910-12.

Gage.--Water-stage recorder. Datum of gage is 7,055.80 ft above mean sea level (Bureau of Reclamation bench mark). Jan. 1 to Dec. 31, 1909, staff gage at site 3.3 miles downstream at different datum. Aug. 27, 1910, to Nov. 30, 1912, staff gage and Apr. 25, 1930, to Sept. 30, 1934, water-stage recorder, at site 3.2 miles upstream at different datums. Apr. 1, 1942, to Oct. 21, 1958, at site 0.7 mile upstream at datum 40.64 ft higher.

Average discharge.--25 years (1910-12, 1930-34, 1942-61), 232 cfs (168,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,350 cfs Apr. 29; maximum gage height, 5.22 ft May 28; minimum daily discharge, 40 cfs Feb. 7.

1909-12, 1930-34, 1942-61: Maximum discharge, 10,000 cfs Sept. 5, 1909 (result of failure of Trout and Middle Reservoir Dams); minimum daily, 26 cfs Jan. 5, 1960.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 1,700 acres above station. One diversion from Fall Creek for irrigation of about 2,000 acres in Beaver and Saltado Creek basins. One small ditch diverts water from Leopard Creek to Uncompahgre River basin. Slight regulation by Lake Hope and Trout Lake of Western Colorado Power Co. (combined capacity, 5,040 acre-ft).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	40	3.7	295	4.5	720
2.8	95	4.0	415	5.0	1,160
3.3	190				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92	*98	60	55	55	50	70	713	1,130	397	167	138
2	91	95	65	50	55	55	71	728	1,080	384	215	131
3	95	100	70	50	60	60	86	728	907	350	302	154
4	*98	100	60	50	55	55	124	671	752	358	330	144
5	88	100	55	50	50	50	152	574	768	334	268	144
6	88	100	45	50	45	45	*136	487	792	312	228	150
7	91	108	50	55	*40	45	146	*420	*816	302	198	*161
8	83	107	65	60	45	*45	125	388	943	309	205	156
9	88	100	70	*65	55	45	107	374	1,030	292	174	210
10	108	102	65	60	60	50	107	430	997	280	148	258
11	118	104	60	60	60	55	113	509	988	265	*150	215
12	102	100	65	60	65	55	108	568	1,040	*250	230	195
13	95	98	65	55	65	55	118	544	943	250	178	176
14	90	94	60	60	65	60	110	470	880	238	161	174
15	88	95	55	60	65	65	88	430	880	220	148	172
16	95	86	55	60	65	70	90	392	784	169	178	161
17	98	94	55	60	65	75	108	397	776	156	235	152
18	110	95	55	55	60	70	154	476	800	165	208	190
19	102	100	60	55	55	65	222	594	776	161	208	262
20	100	92	55	55	55	65	420	643	824	161	174	252
21	98	91	50	55	60	*65	450	643	*784	167	163	232
22	92	92	55	55	60	65	514	880	720	154	146	250
23	90	91	55	55	55	70	550	*864	636	138	136	298
24	91	85	60	60	50	87	430	800	601	124	133	258
25	88	80	60	65	50	85	306	856	568	138	161	238
26	92	77	60	65	60	75	289	925	520	140	156	215
27	94	78	55	65	55	69	334	1,040	492	161	138	200
28	104	77	55	60	50	69	520	1,160	430	159	138	208
29	98	65	55	50	-	69	699	1,150	410	150	136	210
30	92	65	60	55	-	68	713	1,080	406	161	150	212
31	90	-----	60	55	-----	64	-----	1,050	-----	150	144	-----
Total	2,949	2,769	1,815	1,765	1,580	1,921	7,460	20,984	23,473	6,995	5,706	5,916
Mean	95.1	92.3	58.5	56.9	56.4	62.0	249	677	782	226	184	197
Ac-ft	5,850	5,490	3,600	3,590	3,130	3,810	14,800	41,620	46,560	13,870	11,320	11,730

Calendar year 1960: Max 1,240 Min 26 Mean 227 Ac-ft 164,800  
 Water year 1960-61: Max 1,160 Min 40 Mean 228 Ac-ft 165,300

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-22	6:30p.m.	4.75	925	5-28	11:30p.m.	5.22	1,340
4-29	7p.m.	5.18	1,350	6-12	12:30p.m.	5.17	1,280

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 29 to Mar. 23 (no gage-height record Dec. 5 to Mar. 21).

9-1730. Beaver Creek near Norwood, Colo.

Location--Lat 37°58', long 108°11', in sec.28, T.43 N., R.12 W., on left bank 550 ft upstream from Goat Creek and 13 miles southeast of Norwood.

Drainage area--35.2 sq mi.

Records available--October 1941 to September 1961 (discontinued). Monthly discharge only for some periods, published in WSP 1313.

Gage--Water-stage recorder. Datum of gage is 8,008.81 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1948, at site 50 ft downstream at datum 2.00 ft higher. Oct. 1, 1948, to July 16, 1952, at site 50 ft downstream at same datum.

Average discharge--20 years, 18.3 cfs (13,250 acre-ft per year).

Extremes--Maximum discharge during year, 189 cfs May 2 (gage height, 4.66 ft); minimum daily, 0.1 cfs July 24-26, 28.

1941-61: Maximum discharge, 750 cfs June 9 or 10, 1952 (gage height, 5.67 ft, from floodmarks), from rating curve extended above 370 cfs; no flow at times in 1946, 1950-51, 1954, 1956, 1959.

Remarks--Records fair except those for periods of ice effect, which are poor. Gurley ditch diverts water above station to Gurley Reservoir (capacity, 8,800 acre-ft, 3,200 acre-ft prior to September 1948) for irrigation of about 12,000 acres in Naturita Creek drainage.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	*1.3					3.7	142	13	1.2	0.7	3.2
2	2.0	1.3					4.1	155	16	.7	3.2	3.3
3	1.8	1.2					5.8	145	13	.8	1.0	5.1
4	*1.5	1.2					9.4	128	11	1.1	2.3	6.9
5	1.1	1.2					9.0	*98	9.9	1.1	2.1	7.6
6	.9	1.2				1	7	57	9.4	.8	1.0	6.9
7	.9	1.4					9.0	29	9.0	.9	.7	*6.9
8	.8	1.8					6	28	*9.4	1.2	.5	5.5
9	.8	1.8					7	27	9.0	.9	.4	7.6
10	1.5	1.6					7.2	36	9.0	.7	.3	12
11	2.5	1.8					6	60	8.6	.5	*.3	5.8
12	1.8	1.8					5.5	75	9.0	*.4	1.3	3.7
13	1.4	1.4				2.5	6	57	8.0	.3	.8	3.5
14	1.3	1.4					5	24	6.2	.3	.5	3.9
15	1.4	1.4					4.6	20	5.5	.3	.4	3.7
16	1.7	1.8	1.8	1.3	1		5	21	5.1	.2	.5	9.4
17	2.1	1.8					8	28	4.7	.2	1.4	5.3
18	2.6	2.0				3.5	15	41	4.5	.2	1.0	7.6
19	2.5	2.0					*30	58	4.1	.2	1.1	14
20	2.1	2.0					60	45	3.5	.3	.7	8.3
21	1.8	2.0					4.0	62	30	.3	.5	8.3
22	1.6	2.0					*4.2	75	33	.3	.4	39
23	1.4	2.0					4.0	86	*28	.2	.3	41
24	1.4	2.0					4.4	60	23	1.7	.4	24
25	1.4	2.0					4.2	37	21	*3.5	.7	17
26	1.3	2.0					4.3	21	20	3.9	.1	13
27	1.3	1.4					3.2	16	16	1.5	.2	6.6
28	1.3	1.6					3.0	27	19	.9	.1	5.1
29	1.4	1.8					3.0	60	15	1.7	.2	4.7
30	1.3	1.8					2.8	100	12	1.1	.6	4.3
31	1.2	-----					2.6	-----	11	-----	.4	-----
Total	47.8	50.0	55.8	40.3	28	79.7	757.3	1502	191.0	14.9	32.5	293.2
Mean	1.54	1.67	1.8	1.3	1	2.57	25.2	48.5	6.37	0.48	1.05	9.77
Ac-ft	95	99	111	80	56	158	1,500	2,980	379	30	64	582

Calendar year 1960: Max 174

Min 0.1

Mean 9.80

Ac-ft 7,120

Water year 1960-61: Max 155

Min 0.1

Mean 8.47

Ac-ft 6,130

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 7 to Mar. 25 (no gage-height record Dec. 5 to Mar.22), Mar. 27, 28, 31, Apr. 6, 8, 9, 11-18.

## DOLORES RIVER BASIN

9-1740. San Miguel River near Nucla, Colo.

Location.--Lat 38°15', long 108°24', in NE $\frac{1}{4}$  sec.10, T.46 N., R.14 W., on right bank 0.4 mile upstream from highway bridge, three-quarters of a mile upstream from Cottonwood Creek, and  $8\frac{1}{2}$  miles east of Nucla.

Drainage area.--660 sq mi, approximately.

Records available.--October 1953 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,800 ft (from topographic map).

Average discharge.--8 years, 247 cfs (178,800 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 2,330 cfs Apr. 29 (gage height, 6.69 ft); minimum daily, 9.5 cfs Oct. 9.

1953-61: Maximum discharge, 3,810 cfs Apr. 22, 1958 (gage height, 7.80 ft); minimum daily, 0.5 cfs Oct. 11-22, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Slight regulation by Lake Hope and Trout Lake of Western Colorado Power Co. (combined capacity, 5,040 acre-ft). Natural flow of stream also affected by water exported from Beaver Creek to Naturita Creek drainage for irrigation of about 12,000 acres, diversions for irrigation of about 5,000 acres above station, and diversion by Colorado Cooperative Canal (see table below) 4 miles upstream for irrigation below.

Cooperation.--Data for computation of diversion by Colorado Cooperative Canal furnished by State engineer and Colorado Cooperative Co., Inc.

Monthly diversion, in acre-feet, water year October 1960 to September 1961

Month	Diversion	Month	Diversion
October.....	4,440	April.....	0
November.....	2,180	May.....	3,940
December.....	169	June.....	5,800
		July.....	5,640
Calendar year 1960.....	31,730	August.....	4,680
		September.....	4,380
January.....	0		
February.....	0	Water year 1960-61.....	31,790
March.....	565		

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used June 14-27)

2.9	5.7	3.5	63	5.0	655
3.0	10	3.9	139	5.5	1,010
3.2	26	4.3	270	6.0	1,500

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	36	65	45	60	55	90	1,320	1,080	315	68	79
2	12	36	65	45	60	60	92	1,290	1,050	297	113	69
3	*14	37	70	35	55	50	111	1,280	898	262	180	88
4	18	39	75	45	60	40	183	1,160	720	270	279	90
5	18	38	*70	50	55	35	288	1,020	734	258	206	86
6	12	41	50	50	50	35	*280	935	762	238	152	90
7	11	47	50	65	45	*30	297	*790	762	226	115	99
8	11	53	60	65	*50	35	216	694	*825	230	147	*97
9	9.5	45	80	*65	60	40	171	629	920	202	147	135
10	25	39	80	65	60	35	186	688	898	189	124	216
11	38	45	65	65	60	30	174	783	846	177	*88	168
12	37	42	70	65	60	30	171	860	935	157	137	139
13	26	42	65	60	65	25	254	846	853	*155	113	121
14	26	39	60	65	65	69	195	714	776	142	93	111
15	22	44	55	65	65	103	144	681	783	128	73	119
16	30	48	50	65	70	107	144	572	694	99	92	137
17	37	99	40	65	65	101	242	566	642	71	149	155
18	47	101	60	60	60	101	476	642	694	79	137	162
19	49	107	65	60	55	93	694	797	*642	71	142	262
20	42	99	60	60	50	90	1,230	905	688	69	115	212
21	41	97	50	55	55	90	1,250	797	668	81	97	202
22	36	99	50	55	60	92	1,260	965	616	74	81	230
23	32	95	60	55	65	103	1,410	*972	542	63	69	306
24	32	92	60	55	50	119	1,080	912	500	45	65	297
25	32	88	65	60	50	128	*648	935	482	47	88	223
26	33	84	60	65	60	105	596	980	437	52	93	192
27	30	88	60	65	55	99	681	1,050	400	65	76	157
28	41	86	65	60	60	97	1,060	1,140	345	66	71	160
29	41	76	60	55	-	93	1,300	1,140	310	62	66	157
30	35	70	45	55	-----	92	1,310	1,070	310	71	74	162
31	*26	-----	40	60	-----	84	-----	1,020	-----	62	86	-----
Total	887.5	1,952	1,870	1,800	1,625	2,266	1,623.3	2,815.3	2,081.2	4,323	3,536	4,721
Mean	28.6	65.1	60.3	58.1	58.0	73.1	541	908	694	139	114	157
Ac-ft	1,760	3,870	3,710	3,570	3,220	4,490	32,200	55,840	41,280	8,570	7,010	9,360

Calendar year 1960: Max 2,150

Min 6.5

Mean 256

Ac-ft 185,700

Water year 1960-61: Max 1,410

Min 9.5

Mean 242

Ac-ft 174,900

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-22	11:30p.m.	6.67	2,320	5-28	5a.m.	5.82	1,270
4-29	11p.m.	6.69	2,330				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 30 to Mar. 13 (no gage-height record Dec. 21 to Jan. 9).



9-1755. San Miguel River at Naturita, Colo.

Location.--Lat 38°13'10", long 108°34'00", in SE¼SW¼ sec.19, T.46 N., R.15 W., on left bank 20 ft downstream from bridge on State Highway 97 in Naturita and 1.2 miles downstream from Naturita Creek.

Drainage area.--1,080 sq mi, approximately.

Records available.--October 1917 to September 1929, May 1940 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 5,392.85 ft above mean sea level, datum of 1929. Apr. 26, 1918, to Sept. 2, 1926, chain gage and Sept. 3, 1926, to Sept. 30, 1929, water-stage recorder, at same site at different datums. Oct. 1, 1940, to Dec. 9, 1941, staff gage at same site and datum.

Average discharge.--33 years, 361 cfs (261,400 acre-ft per year).

Extremes.--Maximum discharge during year, 2,670 cfs Apr. 23 (gage height, 5.62 ft); minimum daily, 28 cfs Jan. 3. 1917-29, 1940-61: Maximum discharge, 7,100 cfs Apr. 15, 1942 (gage height, 9.80 ft), from rating curve extended above 3,800 cfs; minimum daily, 5.8 cfs Sept. 25-28, 30, 1956.

Remarks.--Records good except those for period of no gage-height record, which are poor. Natural flow of stream affected by storage reservoirs, diversions for irrigation of about 22,000 acres above station and 4,000 acres below, and return flow from irrigated areas.

Rating tables, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-19		Oct. 20 to Sept. 30	
1.0	45	0.9	22
1.6	123	1.2	54
		1.5	96
		2.0	195
		2.5	330
		3.0	530
		4.0	1,100
		5.0	1,950

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	67	75	49	68	60	104	1,460	1,100	315	78	90
2	49	73	75	40	66	73	109	1,420	1,100	309	115	78
3	*50	71	87	28	63	80	132	1,390	940	285	190	99
4	53	74	94	34	66	71	240	1,300	800	282	291	116
5	56	78	*82	40	62	68	378	1,090	780	270	248	102
6	46	78	58	57	53	73	303	*1,000	800	252	205	107
7	46	96	53	64	50	*70	*367	872	800	235	188	110
8	48	112	67	74	*57	53	288	746	*842	248	222	*110
9	45	117	92	*78	64	43	222	660	974	222	208	198
10	54	112	88	75	67	54	252	698	950	202	166	276
11	70	116	71	74	67	55	232	818	914	188	138	238
12	78	99	80	73	71	50	212	938	998	168	*188	190
13	64	77	82	67	73	55	303	938	920	*160	136	162
14	66	74	73	71	71	77	248	758	818	150	112	148
15	60	75	63	67	67	117	188	740	836	128	90	156
16	60	94	59	70	81	130	166	615	740	110	101	256
17	66	104	35	71	74	134	242	570	675	73	166	222
18	84	104	73	64	70	150	525	635	728	70	170	259
19	121	110	81	64	64	136	758	788	670	70	168	285
20	98	107	74	66	59	121	1,300	914	*716	68	140	250
21	74	102	55	63	64	117	1,260	812	710	78	114	245
22	77	104	52	59	70	123	1,270	992	640	73	99	268
23	70	102	68	60	77	152	1,560	1,020	555	63	90	351
24	68	94	67	62	57	235	1,260	*944	505	52	121	348
25	70	90	74	68	58	242	*710	962	480	44	127	285
26	67	87	64	74	75	152	655	1,010	435	49	128	245
27	68	90	73	73	62	126	675	1,110	423	62	93	212
28	73	90	77	68	67	125	1,090	1,200	348	71	78	205
29	81	80	73	62	-	119	1,400	1,200	324	71	73	205
30	70	80	55	59	-----	112	1,350	1,150	315	82	77	202
31	*63	-----	44	64	-----	106	-----	1,080	-----	75	102	-----
Total	2,053	2,757	2,164	1,938	1,843	3,279	1,7799	2,9830	2,1836	4,530	4,422	6,018
Mean	66.2	91.9	69.8	62.5	65.8	106	593	962	728	146	143	201
Ac-ft	4,070	5,470	4,290	3,840	3,660	6,500	35,300	59,170	43,310	8,990	8,770	11,940

Calendar year 1960: Max 2,250 Min 19 Mean 283 Ac-ft 205,400  
 Water year 1960-61: Max 1,560 Min 28 Mean 270 Ac-ft 195,300

Peak discharge (base, 1,800 cfs).--Apr. 23 (12:30 a.m.) 2,670 cfs (5.62 ft); Apr. 29 (1 a.m.) 2,620 cfs (5.57 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record June 1-7.

## DOLORES RIVER BASIN

9-1770. San Miguel River at Uravan, Colo.

Location.--Lat 38°21'25", long 108°42'40", in SW¼NE¼ sec.2, T.47 N., R.17 W., on right bank 20 ft downstream from bridge on State Highway 141, 300 ft downstream from Tabeguache Creek, and 1½ miles southeast of Uravan.

Drainage area.--1,550 sq mi, approximately.

Records available.--August 1954 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 5,000 ft (from topographic map). Prior to Sept. 3, 1959, at site 0.5 mile downstream at different datum.

Average discharge.--7 years, 347 cfs (251,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,120 cfs Apr. 30 (gage height, 7.15 ft); minimum daily, 30 cfs Jan. 4.

1954-61: Maximum discharge, 6,690 cfs Apr. 19, 1958 (gage height, 11.75 ft, site and datum then in use); minimum daily, 14 cfs Sept. 16, 18-20, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by storage reservoirs, diversions for irrigation of about 28,000 acres above station, and return flow from irrigated areas.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.1	25	4.5	280
3.3	40	5.0	500
3.7	77	6.0	1,190
4.0	125	7.0	1,990

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	82	92	50	68	62	1 02	1 51 0	1 1 40	3 60	90	1 33
2	62	78	96	40	66	68	1 05	1 4 50	1 1 30	3 52	1 09	94
3	* 52	89	92	35	64	82	1 17	1 4 30	9 98	3 24	1 89	1 19
4	57	93	1 04	30	65	76	2 31	1 3 40	8 14	3 20	3 48	1 59
5	61	96	* 98	45	64	72	4 00	1 1 90	7 79	3 08	3 00	1 21
6	60	99	65	55	60	76	3 40	* 1 09 0	8 07	2 88	2 52	1 19
7	55	1 59	55	70	55	* 69	* 4 00	9 58	8 07	2 66	1 80	1 19
8	54	1 32	70	75	* 56	62	3 60	8 14	8 56	2 70	2 69	* 1 23
9	57	1 35	86	* 80	65	52	2 62	7 44	* 9 74	2 48	2 28	3 95
10	62	1 25	94	80	69	62	2 84	7 93	9 74	2 24	1 86	5 16
11	89	1 25	81	75	68	66	2 66	9 42	9 18	2 10	1 50	2 80
12	94	1 23	75	75	73	64	2 42	1 09 0	1 0 10	1 89	* 1 77	2 28
13	78	90	87	70	74	65	3 08	1 08 0	9 34	* 1 68	1 59	1 98
14	81	96	77	75	81	74	2 88	8 94	8 35	1 65	1 13	1 77
15	81	92	70	70	73	1 35	2 17	8 56	8 42	1 40	93	1 74
16	73	1 00	67	70	82	1 56	1 80	7 37	7 72	1 25	1 32	3 36
17	75	1 13	55	75	90	1 45	2 31	7 00	7 12	86	1 98	3 23
18	94	1 13	59	70	77	1 62	4 65	7 51	7 44	73	2 04	3 99
19	1 48	1 15	80	70	65	1 59	6 88	9 18	7 06	80	2 10	3 93
20	1 21	1 19	74	70	62	1 32	1 22 0	1 0 40	* 7 30	75	1 65	2 66
21	89	1 11	63	65	64	1 21	1 37 0	9 34	7 30	81	1 25	2 56
22	94	1 05	54	65	70	1 23	1 21 0	1 06 0	6 88	87	1 07	3 08
23	87	1 09	74	65	76	1 45	1 50 0	1 11 0	6 04	75	87	3 68
24	84	1 05	68	70	60	2 31	* 1 33 0	* 1 05 0	5 50	65	1 34	3 76
25	86	96	68	72	61	2 84	7 51	1 05 0	5 40	53	1 47	3 24
26	82	96	74	70	73	1 80	7 00	1 06 0	4 90	59	1 59	2 84
27	85	96	68	74	66	1 35	6 88	1 13 0	4 50	60	1 09	2 62
28	84	98	80	68	66	1 25	1 01 0	1 21 0	3 96	80	87	2 38
29	96	90	74	64	-	1 23	1 36 0	1 21 0	3 72	84	82	2 31
30	90	82	63	62	-----	1 19	1 46 0	1 17 0	3 60	90	86	2 24
31	* 85	-----	54	62	-----	1 09	-----	1 11 0	-----	1 04	1 09	-----
Total	2 48 0	3 1 62	2 31 7	2 01 7	1 91 3	3 53 4	1 8 08 5	3 24 21	2 26 62	5 1 09	4 98 4	7 54 3
Mean	80.0	105	74.7	65.1	68.3	114	603	1 046	755	165	161	251
Ac-ft	4,920	6,270	4,600	4,000	3,790	7,010	35,870	64,310	44,950	10,130	9,890	14,960

Calendar year 1960: Max 2,640 Min 22 Mean 332 Ac-ft 241,200

Water year 1960-61: Max 1,510 Min 30 Mean 291 Ac-ft 210,700

Peak discharge (base, 2,000 cfs).--Apr. 23 (4 a.m.) 2,050 cfs (7.08 ft); Apr. 30 (4 a.m.) 2,120 cfs (7.15 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Jan. 2-24.

## DOLORES RIVER BASIN

267

9-1775. Taylor Creek near Gateway, Colo.

Location.--Lat 38°31', long 109°07', in sec.24, T.26 S., R.25 E., in Utah, on left bank at downstream side of bridge, a quarter of a mile downstream from South Taylor Creek and 12 miles southwest of Gateway.

Drainage area.--12 sq mi, approximately.

Records available.--October 1944 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 8,120 ft (by barometer). Prior to Aug. 31, 1949, at site 770 ft downstream at datum 6.00 ft lower.

Average discharge.--17 years, 3.43 cfs (2,480 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 115 cfs Apr. 4 (gage height, 3.65 ft); minimum daily, 0.1 cfs for many days.

1944-61: Maximum discharge, 555 cfs Apr. 18, 1948, from rating curve extended above 220 cfs; no flow at times June to August 1946, Sept. 29, 1949.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions by Hubbard ditch (see table below) above station to John Brown Creek basin began in spring of 1956.

Monthly diversion, in acre-feet, water year October 1960 to September 1961

Month	Diversion in acre-feet	Month	Diversion in acre-feet
October.....	0	April.....	270
November.....	0	May.....	319
December.....	0	June.....	5.6
	- - - - -	July.....	1.2
Calendar year 1960.....	740	August.....	1.6
	- - - - -	September.....	0
January.....	0		
February.....	0	Water year 1960-61.....	617
March.....	20		

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1 to Nov. 18)

2.0	0	2.3	1.7	2.7	12
2.1	.1	2.4	3.2	2.9	24
2.2	.6	2.5	5.5	3.2	57

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2	0.3	0.2	0.2	0.3	2.0	3.4	2.9	0.1	0.4	0.1
2	.1	.2	.2	.2	.2	.3	3.9	2.9	2.2	.1	.5	.1
3	*.1	.2	.2	.2	.2	.3	22	1.7	2.3	.1	.4	.3
4	.1	.2	.2	.2	.2	.3	4.7	1.7	2.2	.1	.9	.3
5	.1	.1	.2	.2	.2	.4	22	3.7	2.3	.2	1.1	.2
6	.1	.2	.2	.2	.2	.4	16	3.2	2.0	.1	.3	.1
7	.1	.2	.2	.2	.2	.4	7.9	3.2	2.0	.2	.2	.1
8	.1	.2	.2	.2	*.2	.4	2.9	4.4	2.0	.1	*.2	.2
9	.4	.2	.2	.2	.2	.4	3.0	4.1	*1.7	.2	.2	3.2
10	.3	.2	.2	.2	.2	.4	1.5	2.9	1.4	.2	.1	.4
11	.2	.2	.2	.2	.2	.4	1.7	*2.9	1.2	.2	.2	.2
12	.1	.2	.2	.2	.2	.4	1.6	7.0	1.0	.1	.4	.2
13	.1	.2	.2	.2	.2	.4	3.9	7.6	.9	.2	.2	.1
14	.2	.2	.2	.2	.3	.6	4.8	8.5	.9	.2	.1	.1
15	.3	.2	.2	.1	.3	.9	2.8	7.0	.7	.2	.2	.2
16	.3	.2	.2	.2	.4	1.4	3.9	5.8	.6	.2	.2	.2
17	.3	.2	.3	.2	.4	1.7	18	5.5	.4	*.2	.2	.2
18	.2	.2	.3	.2	.4	1.8	22	5.8	.4	.1	.1	.6
19	.2	.2	.3	.2	.4	1.2	23	5.3	.3	.1	.1	.2
20	.2	.2	.3	.2	.3	.8	15	1.6	.2	.1	.1	.2
21	.2	.2	.3	.2	.3	1.0	*9.6	1.2	.1	.1	.1	.2
22	.2	.2	.3	.2	.3	1.6	9.6	1.0	.1	.1	.1	.5
23	.2	.2	.3	.2	.3	3.4	4.6	1.4	.1	.1	.1	1.5
24	.2	.2	.3	.2	.3	5.0	2.8	3.2	.1	.1	.1	.7
25	.2	.2	.3	.2	.3	3.4	2.3	3.7	.1	.1	.3	.4
26	.2	.2	.3	.2	.3	2.2	2.0	5.0	.1	.2	.3	.4
27	.2	.2	.3	.3	.3	1.4	2.2	4.1	.1	.1	.2	.3
28	.2	.2	.3	.3	.3	1.2	*3.4	4.1	.1	.1	.1	.3
29	.2	.2	.3	.2	-	1.0	4.6	3.9	.1	.2	.2	.2
30	.2	.2	.3	.2	-	1.0	4.4	3.4	.1	.4	.2	.2
31	*.2	-----	.3	.2	-----	1.3	-----	3.0	-----	8.3	*.2	-----
Total	5.8	5.9	7.8	6.3	7.5	35.7	270.4	122.2	28.6	12.8	8.0	11.9
Mean	0.19	0.20	0.25	0.20	0.27	1.15	9.01	3.94	0.95	0.41	0.26	0.40
Ac-ft	12	12	15	12	15	71	536	242	57	25	16	24

Calendar year 1960: Max 49 Min 0.1 Mean 1.69 Ac-ft 1,220  
Water year 1960-61: Max 47 Min 0.1 Mean 1.45 Ac-ft 1,040

Peak discharge (base, 40 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-4	3p.m.	3.65	115	7-31	1p.m.	3.55	112
4-17	3p.m.	3.37	76				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7, Dec. 4-7, 16-18, Dec. 28 to Jan. 4, Jan. 28-30, Feb. 5, 6, 23, 24, 27, Mar. 6, 7.

## GREEN RIVER BASIN

9-2360. Yampa River near Toponas, Colo.

Location.--Lat 40°03', long 107°04', in NW<sup>1</sup>/<sub>4</sub> sec.20, T.1 N., R.86 W., on left bank at Stillwater campground, three-quarters of a mile downstream from Mandall Creek, three-quarters of a mile upstream from Dome Creek, and 14 miles west of Toponas.

Drainage area.--23 sq mi, approximately.

Records available.--October 1952 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,710 ft (from river-profile map).

Average discharge.--9 years, 40.2 cfs (29,100 acre-ft per year).

Extremes.--Maximum discharge during year, 140 cfs July 12 (gage height, 4.46 ft); minimum daily, 11 cfs Mar. 6.  
1952-61: Maximum discharge, 436 cfs July 2, 1957 (gage height, 6.39 ft); minimum not determined.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Stillwater Reservoir (capacity, 6,200 acre-ft). No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 28 to May 29,  
July 12-21, Aug. 12 to Sept. 30)

2.8	12	3.5	38
2.9	14	4.0	77
3.2	23	4.5	132

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	18	16	18	15	14	12	22	79	101	42	22
2	20	17	18	17	15	15	12	24	87	92	37	22
3	20	18	18	16	15	14	12	26	83	94	35	23
4	20	18	18	15	16	13	12	26	81	94	33	21
5	20	18	17	16	16	12	12	23	82	87	36	22
6	20	16	16	17	15	11	12	22	*84	88	35	23
7	20	16	18	17	14	13	12	20	86	90	34	22
8	20	15	18	17	15	13	12	20	88	88	28	22
9	20	16	18	17	16	13	12	25	92	83	27	22
10	20	16	18	16	16	12	12	36	96	77	26	22
11	20	16	18	15	16	12	12	44	96	62	24	*22
12	20	16	18	15	17	12	13	46	102	83	24	21
13	20	15	17	16	18	12	14	38	112	86	24	21
14	20	15	16	17	17	12	14	28	110	86	*24	21
15	20	15	15	17	16	12	13	27	106	84	24	20
16	20	16	14	17	15	13	12	27	102	76	29	20
17	20	17	16	16	15	13	13	26	109	*99	29	20
18	20	*17	17	17	15	13	14	26	116	102	27	20
19	20	17	17	16	15	13	15	28	116	101	26	22
20	19	17	16	15	15	13	15	34	124	100	25	21
21	19	17	17	15	16	13	15	40	*109	88	25	22
22	19	17	18	15	17	12	15	46	107	67	23	23
23	18	17	19	15	16	12	15	*50	104	65	23	23
24	20	17	19	16	15	*13	15	58	101	64	23	23
25	19	17	18	15	16	12	15	53	94	58	25	23
26	*22	17	17	14	15	12	15	56	72	53	23	24
27	18	16	16	14	14	12	15	61	70	49	22	24
28	18	15	15	14	13	12	16	63	99	48	22	25
29	14	16	15	13	-	12	18	64	104	43	22	29
30	18	17	16	14	-----	12	20	74	111	43	22	25
31	18	-----	17	15	-----	12	-----	74	-----	44	22	-----
Total	604	495	526	487	434	389	414	1,207	2,922	2,395	841	670
Mean	19.5	16.5	17.0	15.7	15.5	12.5	13.8	38.9	97.4	77.3	27.1	22.3
Ac-ft	1,200	982	1,040	966	861	772	821	2,390	5,800	4,750	1,670	1,330

Calendar year 1960: Max 214 Min -

Mean 39.8

Ac-ft 28,900

Water year 1960-61: Max 124

Mean 31.2

Ac-ft 22,580

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29, 30, Nov. 2, Nov. 6 to Apr. 27. No gage-height record Jan. 1 to Mar. 24, May 17-23.



## GREEN RIVER BASIN

269

9-2375. Yampa River near Oak Creek, Colo.

Location.--Lat 40°17', long 106°50', in SE $\frac{1}{4}$  sec.29, T.4 N., R.84 W., on left bank just upstream from Upper Yampa damsite, 1 mile upstream from Morrison Creek, and 6 $\frac{1}{2}$  miles east of town of Oak Creek.

Drainage area.--227 sq mi.

Records available.--September 1939 to September 1944, October 1956 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 7,100 ft (from river-profile map). Prior to Nov. 16, 1939, staff gage at same site and datum.

Average discharge.--10 years, 81.7 cfs (59,150 acre-ft per year).

Extremes.--Maximum discharge during year, 412 cfs Apr. 3 (gage height, 4.87 ft); maximum gage height, 5.86 ft Mar. 25 (backwater from ice); minimum daily discharge, 24 cfs Jan. 28, Feb. 27.  
1939-44, 1956-61: Maximum discharge, 992 cfs June 16, 1957 (gage height, 6.49 ft), from rating curve extended above 460 cfs; minimum daily, 10 cfs Sept. 12, 1940.

Remarks.--Records good except those for period of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 12,000 acres above station. Flow partly regulated by Stillwater Reservoir (capacity, 6,200 acre-ft).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 14-24, May 21 to June 10)

3.0 33 3.5 97  
3.2 52 4.3 256

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	65	55	38	36	28	80	108	57	70	87	46
2	48	60	60	38	36	32	82	112	57	61	85	45
3	49	60	50	*36	34	36	236	122	57	56	78	61
4	43	57	40	34	36	36	210	*116	58	53	66	74
5	44	56	34	36	38	36	124	122	60	65	62	82
6	44	52	*30	38	36	34	95	103	65	44	56	72
7	43	61	34	40	34	34	83	90	*58	38	55	61
8	43	57	36	42	34	34	76	88	60	46	53	57
9	44	52	42	42	34	36	71	77	65	46	52	62
10	48	50	44	42	34	34	75	92	65	44	48	58
11	49	50	42	42	36	32	68	128	60	42	46	53
12	55	50	38	42	36	34	82	148	61	41	48	*50
13	55	55	34	42	36	36	97	140	51	40	55	49
14	60	52	34	42	36	36	77	106	40	42	52	45
15	60	52	36	42	34	40	74	94	41	50	*49	44
16	60	55	34	40	32	42	80	87	40	45	46	45
17	65	55	32	38	32	48	*90	83	42	42	51	53
18	70	60	32	38	32	55	110	72	39	*43	49	52
19	65	*55	32	38	28	60	136	88	36	44	43	58
20	60	50	36	38	32	65	184	114	37	48	43	57
21	60	55	38	34	32	70	132	99	*38	88	55	71
22	55	60	40	32	32	65	103	95	38	88	46	99
23	55	60	44	*30	32	60	103	97	34	71	42	105
24	50	55	44	30	30	80	97	95	34	64	39	110
25	48	50	44	32	30	150	87	*87	39	65	41	106
26	*46	50	44	36	28	140	85	78	39	70	60	118
27	46	48	42	30	*24	100	80	80	41	71	46	148
28	45	44	38	24	26	70	78	74	51	71	41	192
29	46	42	36	28	-	*61	87	66	61	74	40	240
30	44	46	38	30	-----	58	101	71	68	87	43	186
31	55	-----	36	32	-----	65	-----	66	-----	80	53	-----
Total	1,601	1,614	1,219	1,126	920	1,707	3,084	2,998	1,492	1,789	1,630	2,499
Mean	51.6	53.8	39.3	36.3	32.9	55.1	103	96.7	49.7	57.7	52.6	83.3
Ac-ft	3,180	3,200	2,420	2,230	1,820	3,390	6,120	5,950	2,960	3,550	3,230	4,960

Calendar year 1960: Max 668 Min 30 Mean 89.3 Ac-ft 64,860  
Water year 1960-61: Max 240 Min 24 Mean 59.4 Ac-ft 43,010

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 13-24. Stage-discharge relation affected by ice Oct. 30, 31, Nov. 10-12, Nov. 16 to Mar. 27.

## GREEN RIVER BASIN

9-2395. Yampa River at Steamboat Springs, Colo.

Location.--Lat 40°29', long 106°50', in sec.17, T.6 N., R.84 W., on right bank 30 ft downstream from First Street Bridge in Steamboat Springs and a quarter of a mile upstream from Soda Creek.

Drainage area.--604 sq mi.

Records available.--May 1904 to October 1906, October 1909 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,695.47 ft above mean sea level, datum of 1929. Prior to May 8, 1905, staff gage at bridge a quarter of a mile upstream at datum 4.16 ft higher. May 8, 1905, to Oct. 31, 1906, chain gage on bridge 30 ft upstream at datum 0.44 ft higher. Mar. 8, 1910, to Sept. 11, 1934, water-stage recorder at present site at datum 0.44 ft higher.

Average discharge.--54 years, 470 cfs (340,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,780 cfs May 29 (gage height, 4.74 ft); minimum daily, 63 cfs July 19, 20, Aug. 24, 25, 29, 1904-6, 1909-61: Maximum discharge, 6,820 cfs June 14, 1921 (gage height, 7.08 ft, present datum), from rating curve extended above 4,800 cfs; minimum daily, 4 cfs Sept. 8, 1934, Sept. 10-13, 1944.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow of stream affected by 2 diversions for irrigation to Egeria Creek in Colorado River basin, 1 diversion for irrigation from Trout Creek drainage to Oak Creek drainage, irrigation of about 19,700 acres above station, and storage in Stillwater Reservoir (capacity, 6,200 acre-ft).

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	63	3.0	1,030
1.2	113	4.0	1,910
1.5	195	4.5	2,420
2.0	400		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	111	100	100	85	76	220	584	2,300	234	131	111
2	70	105	120	90	85	84	254	728	2,250	195	153	105
3	70	103	110	80	85	86	405	*817	2,040	162	162	122
4	68	103	113	*80	85	84	626	789	1,760	153	126	141
5	66	103	101	85	85	88	410	782	1,710	192	111	165
6	66	97	*95	90	80	83	328	638	1,680	159	101	216
7	64	111	100	100	80	83	265	518	*1,810	124	93	216
8	66	117	110	100	85	79	216	485	1,870	117	91	171
9	66	103	110	100	85	85	240	465	1,900	122	93	150
10	68	91	100	100	85	79	226	596	1,740	111	86	144
11	72	93	100	100	85	75	171	958	1,640	95	79	117
12	78	113	95	100	90	83	180	1,310	1,550	90	79	*105
13	83	107	95	95	90	90	265	1,300	1,400	83	86	99
14	91	105	90	95	90	90	234	958	1,230	76	86	91
15	97	99	80	95	85	91	189	824	1,120	75	*81	86
16	99	97	75	90	85	105	205	796	966	72	75	88
17	105	107	65	90	85	122	*273	768	859	66	76	153
18	111	99	80	90	80	138	430	782	750	*64	81	150
19	*105	*109	90	90	80	162	596	943	660	63	71	171
20	97	83	85	90	80	186	680	1,260	600	63	66	212
21	95	91	95	85	76	168	495	1,430	540	109	71	277
22	91	111	100	85	84	165	405	1,720	*495	174	73	360
23	90	100	110	85	88	*159	415	1,890	425	133	67	355
24	88	100	110	90	86	198	390	1,920	375	109	63	336
25	86	100	110	*90	86	360	341	*2,060	350	105	63	310
26	86	100	95	90	81	360	314	2,220	293	103	79	328
27	86	100	90	90	90	220	277	2,270	237	105	95	400
28	88	90	90	80	*86	177	265	2,380	226	113	72	485
29	86	90	90	75	-	159	314	2,300	220	128	63	831
30	70	90	90	80	-----	165	455	2,400	248	128	67	650
31	75	-----	95	85	-----	177	-----	2,210	-----	122	91	-----
Total	2,553	3,028	2,989	2,795	2,367	4,277	10,085	39,101	33,244	3,645	2,731	7,145
Mean	82.4	101	96.4	90.2	84.5	138	336	1,261	1,108	118	88.1	238
Ac-ft	3,060	6,010	2,930	2,340	4,690	8,480	20,000	77,560	62,940	7,230	2,420	14,170

Calendar year 1960: Max 2,700 Min 45 Mean 436 Ac-ft 316,800

Water year 1960-61: Max 2,400 Min 63 Mean 312 Ac-ft 226,000

Peak discharge (base, 3,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Dec. 6 to Feb. 20, Feb. 27, Mar. 9. No gage-height record Nov. 23 to Dec. 3, June 18-21.

9-2410. Elk River at Clark, Colo.

Location.--Lat 40°43'00", long 106°54'50", in sec.28, T.9 N., R.85 W., on left bank 30 ft upstream from bridge on State Highway 129 in Clark and 1 mile upstream from Cottonwood Gulch.

Drainage area.--206 sq mi.

Records available.--May 1910 to September 1922 (published as "near Clark"), April 1930 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 7,267.75 ft above mean sea level (State Highway Department bench mark). May 1910 to September 1922, chain gage at site 30 ft upstream at datum 0.15 ft lower. Apr. 23, 1930, to Sept. 27, 1934, water-stage recorder at present site at datum 0.15 ft lower.

Average discharge.--43 years, 342 cfs (247,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,720 cfs May 29 (gage height, 3.84 ft); minimum daily, 26 cfs Oct. 30.

1910-22, 1930-61: Maximum daily discharge, 4,470 cfs June 6, 9, 1912; minimum daily determined, 23 cfs Dec. 25, 1952, but a lesser discharge may have occurred during periods of no gage-height record prior to 1939.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 230 acres above and about 460 acres below station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 2-7, 11-28, Apr. 1, 2)

0.6	25	1.2	100	2.5	590
.7	32	1.5	168	3.0	930
.9	53	2.0	340	4.0	1,900

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	45	46	32	32	46	63	420	1,320	405	129	100
2	50	39	44	30	32	49	63	540	1,320	350	147	110
3	50	41	44	30	32	49	65	545	1,220	328	124	120
4	50	52	44	*30	32	48	70	*485	978	320	102	124
5	46	45	40	32	30	49	65	400	930	312	95	145
6	46	39	34	32	32	48	60	308	970	280	89	179
7	46	52	*34	32	32	47	60	263	*1,050	272	80	185
8	46	48	36	34	32	36	60	268	1,150	264	79	168
9	48	42	38	34	32	38	65	365	1,240	226	76	163
10	50	47	38	34	32	38	62	560	1,300	211	74	152
11	50	47	36	36	32	47	61	801	1,240	196	69	124
12	50	53	34	36	34	47	62	938	1,190	182	69	*110
13	55	51	32	36	32	49	71	773	1,160	174	91	100
14	55	*49	32	36	32	49	61	575	1,060	163	84	91
15	60	43	32	36	32	53	55	626	978	168	*74	87
16	60	47	30	36	32	60	63	575	986	155	68	86
17	60	51	30	34	34	62	64	515	946	147	68	152
18	60	47	32	34	34	60	*84	555	906	*142	66	129
19	55	49	34	32	32	56	116	680	882	135	61	193
20	55	40	36	32	32	56	158	850	1,010	133	57	168
21	50	44	36	30	32	54	147	922	906	202	71	199
22	46	48	34	30	32	56	155	1,040	*829	163	63	208
23	44	49	30	32	32	62	176	1,030	766	133	54	196
24	38	49	30	32	34	71	147	1,000	704	122	51	179
25	*36	45	32	*32	32	72	129	*1,100	644	120	62	168
26	36	46	34	32	32	65	116	1,290	580	118	129	196
27	38	46	30	30	38	62	120	1,300	555	118	80	220
28	36	47	28	28	*40	*61	150	1,290	520	110	65	260
29	35	44	30	30	-	50	229	1,330	465	110	60	450
30	26	44	30	32	-----	55	324	1,470	445	104	87	308
31	42	-----	30	32	-----	60	-----	1,340	-----	122	104	-----
Total	1,469	1,394	1,070	1,008	916	1,655	3,121	24,159	28,250	5,985	2,528	5,070
Mean	47.4	46.5	34.5	32.5	32.7	53.4	104	779	942	193	81.5	169
Ac-ft	2,910	2,760	2,120	2,000	1,820	3,280	6,190	47,920	56,030	11,870	5,010	10,060

Calendar year 1960: Max 1,750 Min 26 Mean 274 Ac-ft 199,200  
Water year 1960-61: Max 1,470 Min 26 Mean 210 Ac-ft 152,000

Peak discharge (base, 1,900 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Oct. 1-25. Stage-discharge relation affected by ice Oct. 30, Nov. 20-22, Nov. 29 to Mar. 1, Mar. 8-10, 29-31, Apr. 5-8, 15.

## GREEN RIVER BASIN

9-2441. Fish Creek near Milner, Colo.

Location.--Lat 40°20'10", long 107°08'20", in NW $\frac{1}{4}$  sec.11, T.4 N., R.87 W., on left bank 200 ft downstream from highway bridge, a quarter of a mile upstream from Coyote Creek, and 12 miles southwest of Milner.

Drainage area.--34.5 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,930 ft (from topographic map). Prior to Apr. 8, 1958, at site 200 ft upstream at different datum. Apr. 8 to Aug. 14, 1958, at site 200 ft upstream at datum 3.14 ft higher.

Average discharge.--6 years, 13.3 cfs (9,630 acre-ft per year).

Extremes.--Maximum discharge during year, 114 cfs May 11 (gage height, 4.61 ft), from rating curve extended above 110 cfs; minimum daily, 1.0 cfs Oct. 31, July 18, 19.

1955-61: Maximum discharge, 255 cfs Mar. 27, 1960; maximum gage height, 5.75 ft Mar. 25, 1960; minimum daily discharge, 0.7 cfs Sept. 9, 1959, Aug. 21, 22, 28, 1960.

Remarks.--Records fair except those for periods of ice effect, no gage-height record, or backwater from beaver dams, which are poor. Diversions above station for irrigation.

Rating table, water year 1960-61, except periods of ice effect or backwater from beaver dam (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-29, Nov. 1, 3, 4, May 15-27, Sept. 4-11)

2.9	0.6	3.4	8.0
3.0	1.2	3.7	22
3.1	2.1	4.0	39
3.2	3.5	4.3	63
3.3	5.5	4.5	87

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	1.8	4.8	3.6	3.4	3.1	7.0	33	31	1.9	1.6	2.5
2	1.2	1.6	4.6	3.4	3.6	3.1	8.4	40	26	1.8	1.6	3.2
3	1.2	1.7	5.0	3.0	3.8	3.1	19	*42	24	1.8	1.4	4.3
4	1.3	1.9	5.5	*2.6	3.8	3.2	20	38	20	1.9	1.6	4.3
5	1.3	1.6	5.1	2.4	3.6	3.2	*12	37	18	1.8	1.6	4.7
6	1.3	1.4	*4.5	2.6	3.4	3.2	9.5	26	18	1.6	1.6	7.2
7	1.3	1.6	4.3	2.8	3.4	3.2	9.5	23	16	1.6	1.6	6.0
8	1.3	1.6	4.3	2.8	3.6	3.0	9	22	16	1.6	1.8	3.7
9	1.4	2.0	4.5	2.8	3.8	3.0	7	27	14	1.4	2.0	5.8
10	1.5	2.2	5.3	2.8	3.8	3.2	8.0	42	13	1.4	2.1	4.3
11	1.8	2.4	4.9	2.8	3.8	3.2	6.5	61	12	1.6	2.4	2.9
12	2.0	2.6	4.3	3.0	3.6	3.2	8.4	65	7.8	1.4	2.9	*2.9
13	1.8	2.8	4.1	3.2	3.4	3.2	12	55	4.9	1.5	5.6	3.1
14	2.0	2.8	3.8	3.4	3.4	3.2	9	40	4.3	1.6	3.7	3.5
15	2.0	2.6	4.2	3.6	3.6	3.0	9	39	5.1	1.5	*2.2	3.6
16	1.9	2.6	4.2	3.6	3.8	3.2	10	42	4.9	1.2	2.4	4.2
17	2.0	3.4	4.2	3.4	3.8	3.4	*14	38	4.5	1.1	2.5	4.6
18	1.8	*5.0	4.2	3.4	3.6	3.6	22	41	4.1	*1.0	2.4	5.5
19	1.8	4.6	4.4	3.2	3.4	3.8	32	48	4.1	1.0	2.0	6.5
20	*1.7	4.6	4.4	3.2	3.4	4.0	33	54	4.5	1.2	2.2	6
21	1.6	5	4.4	3.4	3.6	3.8	22	53	*4.1	2.0	2.7	7
22	1.5	5	4.2	3.6	3.6	3.6	20	45	3.5	1.6	2.2	8
23	1.5	5.5	4.2	*4.0	3.4	3.4	22	37	3.2	1.3	2.1	7
24	1.5	5.5	4.1	3.8	3.2	3.6	18	34	2.8	1.3	2.2	6.5
25	1.4	5.5	4.1	3.8	3.4	4.0	14	*33	2.9	1.6	2.5	6
26	1.4	5	4.1	3.6	3.4	3.8	14	34	2.5	1.4	3.1	7
27	1.5	5	4.3	3.2	3.2	3.6	13	32	2.5	1.3	2.7	8
28	1.5	4.8	3.9	2.8	*3.8	3.4	16	33	2.8	1.4	2.1	9.5
29	1.6	4.8	3.9	3.0	-	*3.2	24	31	2.2	1.6	1.9	12
30	1.2	5.0	3.8	3.2	-----	3.4	29	35	2.1	1.3	2.2	10
31	1.0	-----	3.6	3.2	-----	4.0	-----	33	-----	1.3	2.7	-----
Total	47.4	101.9	135.2	99.2	99.6	104.9	457.3	1213	280.8	46.0	71.6	169.8
Mean	1.53	3.40	4.36	3.20	3.56	3.38	15.2	39.1	9.36	1.48	2.31	5.66
Ac-ft	94	202	268	197	198	208	907	2,410	557	91	142	337

Calendar year 1960: Max 100 Min 0.7 Mean 12.4 Ac-ft 9,000  
Water year 1960-61: Max 65 Min 1.0 Mean 7.74 Ac-ft 5,610

Peak discharge (base, 180 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 2, 5, 6, Nov. 19 to Dec. 3, Dec. 14-18, Mar. 9-31, Apr. 6-9, 11, 14, 15. No gage-height record Nov. 7-18, Dec. 19-23, Dec. 30 to Feb. 28, Mar. 4-8. Backwater from beaver dams Sept. 15-30.



9-2443. Grassy Creek near Mount Harris, Colo.

Location.--Lat 40°26'45", long 107°08'38", in SE<sup>1</sup> sec.28, T.6 N., R.87 W., on right bank 60 ft downstream from bridge, 150 ft downstream from small tributary, 2½ miles south of Mount Harris, and 3 miles upstream from mouth.

Drainage area.--25.8 sq mi.

Records available.--October 1958 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 6,580 ft (from topographic map).

Extremes.--Maximum discharge during year, 22 cfs Apr. 12 (gage height, 2.07 ft); no flow for many days.  
1958-61: Maximum discharge, 235 cfs Apr. 6, 1960 (gage height, 5.05 ft); no flow for many days each year.

Remarks.--Records good except those for period of ice effect, which are poor. No diversion above station.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.7	0	1.2	2.0
.8	.03	1.3	3.4
.9	.2	1.4	5.0
1.0	.7	1.6	9.0
1.1	1.2	1.8	14

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	5.0	0.1				0
2						0.2	5.2	.1				0
3						.5	9.4	*.1				0
4				(*)		.3	3.6	.2				0
5						.3	*1.4	.8				0
6			(*)			.2	.9	.5				0
7						.1	.6	.4	(*)			0
8						.2	.8	.6				0
9						.3	.9	.4				0
10						.5	1.5	.2				0
11						.6	1.8	.1				0
12						.7	7.4	0				*0
13						.8	1.2	.1				0
14						1.0	7.4	.2				0
15						1.0	2.8	.8			(*)	0
16						1.2	5.0	.9				0
17			(*)			1.2	*5.4	1.2				0
18						1.2	2.8	.6		(*)		0
19	(*)					1.0	2.0	.4				0
20						1.0	4.7	.2				0
21						.9	2.1	.2				.3
22						.8	1.1	.1				1.3
23						1.0	.8	.1				4.0
24						1.2	.8	.1				6.0
25						1.2	.7	*.1				4.0
26						1.0	.5	.2				2.6
27						1.5	.4	.2				1.0
28					(*)	*1.0	.2	.1				.2
29						.7	.2	0				2.0
30						.8	1	0				.6
31						1.6		0				
Total	0	0	0	0	0	24.0	87.5	9.0	0	0	0	22.0
Mean	0	0	0	0	0	0.77	2.92	0.29	0	0	0	0.73
Ac-ft	0	0	0	0	0	48	174	18	0	0	0	44

Calendar year 1960: Max 86 Min 0 Mean 2.56 Ac-ft 1,860

Water year 1960-61: Max 12 Min 0 Mean 0.39 Ac-ft 284

Peak discharge (base, 8.0 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-3	2:30p.m.	1.90	16	4-16	5p.m.	1.74	12
4-12	5p.m.	2.07	22	9-24	5:30p.m.	1.67	10

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Mar. 2-26.

## GREEN RIVER BASIN

9-2445. Elkhead Creek near Clark, Colo.

Location.--Lat 40°44'00", long 107°10'20", in SE $\frac{1}{4}$  sec.17, T.9 N., R.87 W., on left bank 0.5 mile downstream from South Fork, 13 miles west of Clark, and 17 miles north of Hayden.

Drainage area.--45.4 sq mi.

Records available.--October 1942 to March 1943 (monthly discharge only, published in WSP 1313), July 1943 to September 1944, October 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,800 ft (from topographic map). Prior to October 1958, water-stage recorder at site 40 ft downstream at different datum.

Extremes.--Maximum discharge during year, 288 cfs May 11 (gage height, 3.74 ft), from rating curve extended above 140 cfs; minimum daily, 0.3 cfs Aug. 23, 28, 29.

1942-44, 1958-61: Maximum daily discharge, 520 cfs (estimated) May 22, 1944; maximum gage height, 4.93 ft Apr. 11, 1960 (backwater from ice); minimum daily discharge, that of Aug. 23, 28, 29, 1961.

Remarks.--Records good except those for period of ice effect, which are poor. No diversion above station.

Rating tables, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

1.7 0  
1.8 .5  
1.9 2.5  
2.0 7.5

1.6 0  
1.7 1.0  
1.8 4.0  
1.9 8.0  
2.0 14

2.2 32  
2.6 88  
3.0 151  
3.3 204

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	3.0				2.0	3.4	133	70	6.0	2.5	2.2
2	.7	2.3				2.2	3.8	168	66	5.6	2.8	3.4
3	.7	2.5				2.2	4.0	138	64	5.2	2.5	4.4
4	.9	3.5				2.0	4.0	113	55	5.2	1.6	3.7
5	.9	2.5				2.0	3.6	90	47	5.2	.9	3.4
6	.9	2.1				2.0	3.6	61	44	4.8	.9	3.1
7	.9	2.0				2.0	3.4	64	38	4.4	.6	2.5
8	1.1	2.0				2.0	*3.2	52	36	3.7	.5	2.2
9	1.3	2.0				2.2	3.0	96	31	3.4	.5	3.7
10	2.1	2.0				2.4	2.6	160	28	3.1	.5	3.7
11	3.5	2.2				2.4	2.4	197	24	2.8	.5	2.5
12	4.0	2.4				2.4	2.4	177	23	2.2	.5	*2.2
13	2.3	2.4				2.2	2.6	143	20	1.9	.7	1.3
14	3.0	2.4				2.2	2.8	106	19	1.9	.6	1.0
15	2.1	2.4				2.2	2.6	143	17	2.2	.4	1.0
16	2.1	2.4	2	1.8	2.4	2.4	2.4	138	16	1.6	.7	1.6
17	2.1	2.2				2.6	3.6	113	15	1.0	1.3	3.1
18	2.1	2.0				2.6	10	114	14	*1.0	*1.0	4.4
19	2.1	2.0				2.4	20	130	*13	1.3	.7	7.6
20	1.9	2.0				2.4	34	138	12	1.3	.4	6.8
21	1.7	2.2				2.4	32	130	10	4.0	.5	10
22	1.7	2.4				2.6	30	130	9.8	3.7	.7	12
23	1.5	2.4				2.8	32	124	8.6	2.5	.3	8.6
24	1.5	2.4				2.8	30	113	8.0	2.2	.4	7.2
25	1.5	2.4				2.8	26	105	8.0	1.6	.6	6.0
26	1.3	2.2				2.8	20	105	7.2	1.3	.8	8.0
27	*1.5	2.0				2.8	16	103	6.8	2.8	.5	10
28	1.7	1.6				2.6	28	98	7.2	1.9	.3	12
29	1.9	1.8				2.4	70	90	6.4	1.3	.3	29
30	1.9	2.0				2.4	98	90	6.0	1.0	1.0	16
31	1.9	-----				2.4	-----	*80	-----	1.9	2.2	-----
Total	53.5	67.7	62	55.8	67.2	73.6	499.4	3,642	730.0	88.0	27.7	182.6
Mean	1.73	2.26	2	1.8	2.4	2.37	16.6	117	24.3	2.84	0.89	6.09
Ac-ft	106	134	123	111	133	146	991	7,220	1,450	175	55	362

Calendar year 1960: Max 340 Min 0.4 Mean 31.1 Ac-ft 22,580

Water year 1960-61: Max 197 Min 0.3 Mean 15.2 Ac-ft 11,010

Peak discharge (base, 300 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 7 to Apr. 28 (no gage-height record Dec. 4 to Apr. 8).

9-2450. Elkhead Creek near Elkhead, Colo.

Location.--Lat 40°40'15", long 107°17'10", in NW $\frac{1}{4}$  sec.8, T.8 N., R.88 W., on right bank 0.2 mile upstream from North Fork Elkhead Creek,  $\frac{1}{4}$  miles northwest of Elkhead, and 12 miles north of Hayden.

Drainage area.--64.2 sq mi (revised). Area at site used prior to Nov. 30, 1920, 63.7 sq mi (revised).

Records available.--January to November 1910 and May to November 1920 (monthly discharge only, published in WSP 1313; published as "at Hayes Ranch"), April 1953 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,830 ft (from topographic map). Prior to Nov. 30, 1920, staff gage or water-stage recorder at site 675 ft upstream at different datum.

Average discharge.--8 years (1953-61), 44.3 cfs (32,070 acre-ft per year).

Extremes.--Maximum discharge during year, 493 cfs May 11 (gage height, 4.93 ft); no flow Aug. 27-29.

1910, 1920, 1953-61: Maximum daily discharge, 1,660 cfs May 22, 1920; no flow Sept. 1, 1954, Sept. 12-19, 24, 1955, Aug. 27-29, 1961.

Remarks.--Records fair except those for periods of ice effect, backwater from beaver dam, or no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect and backwater from beaver dam  
(gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 26 to June 13)

1.9	0	2.5	5.8	3.2	70
2.0	.1	2.6	9.5	3.5	124
2.2	.4	2.7	15	4.0	245
2.3	1.2	2.9	30	4.5	385
2.4	3.3				

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	1.2	2.2	1.8	2.2	3.4	11	250	88	4.8	0.8	1.4
2	1.4	1.6	2.4	2.0	2.2	*4.0	12	*310	81	4.0	1.2	2.0
3	1.6	1.8	2.6	2.0	2.4	4.4	12	282	80	3.8	1.2	3.6
4	1.4	1.8	2.4	2.0	2.6	4.2	12	228	73	3.6	1.1	3.3
5	1.6	1.4	2.2	2.0	2.4	4.0	11	205	*66	3.3	.9	2.7
6	1.6	1.4	2.0	2.2	2.2	4.0	11	158	64	3.1	.6	1.8
7	1.8	1.2	*3.0	2.2	2.2	4.2	11	131	58	2.9	.4	1.6
8	1.6	1.0	2.4	2.2	2.4	3.8	12	126	52	2.5	.2	1.4
9	2.0	1.2	2.2	2.2	2.6	3.6	14	165	47	2.0	.2	2.0
10	2.4	1.4	2.0	2.0	2.8	3.8	13	265	42	1.6	.2	3.1
11	2.8	1.6	2.0	2.0	3.0	4.2	14	328	36	1.4	.2	3.6
12	2.4	1.6	2.0	2.0	2.8	4.4	13	304	34	1.2	.1	1.4
13	2.0	1.4	2.0	2.0	2.6	4.4	12	248	30	1.2	.1	*1.0
14	2.2	1.2	2.0	2.2	2.6	4.4	13	188	27	1.0	.1	.9
15	2.0	1.2	2.0	2.4	2.8	5.0	15	228	25	.9	.1	.8
16	2.2	1.2	2.2	2.2	3.0	6	18	232	22	1.1	.1	.6
17	2.2	1.2	2.4	2.2	3.2	6.5	19	205	21	.9	.1	1.2
18	2.2	*1.2	2.6	2.0	3.0	6.5	*19	205	18	.8	*.1	2.7
19	2.2	1.2	2.4	2.0	2.6	6	24	225	16	.6	.2	5.8
20	2.0	1.4	2.2	2.0	2.8	6	42	238	14	.7	.2	7.6
21	1.8	1.2	2.2	2.0	3.0	6	30	228	13	*1.0	.2	11
22	1.6	1.2	2.4	2.2	3.2	6.5	34	*232	*11	3.3	.2	17
23	1.6	1.4	2.6	2.4	3.0	7	38	225	9.5	2.7	.1	13
24	1.6	1.6	2.6	2.2	2.8	9	30	202	8.8	1.2	.1	8.8
25	1.4	2.0	2.6	2.2	3.0	10	22	182	8.0	1.0	.1	6.9
26	*1.4	2.0	2.4	2.2	3.2	10	20	175	7.6	.8	.1	7.6
27	1.4	1.8	2.2	2.0	2.6	9.5	22	165	6.9	.6	0	13
28	1.2	1.4	2.0	1.6	3.0	*9	70	148	6.9	1.4	0	15
29	1.2	1.8	2.0	2.0	-	8	180	128	6.2	.6	0	40
30	1.0	2.0	2.0	2.2	-----	9	200	120	5.3	.6	.2	31
31	1.2	-----	2.0	2.0	-----	10	-----	102	-----	1.0	.2	-----
Total	54.2	43.6	70.2	64.6	76.2	186.8	954	6,428	977.2	55.6	9.3	211.8
Mean	1.75	1.45	2.26	2.08	2.72	6.03	31.8	207	32.6	1.79	0.30	7.06
Ac-ft	108	86	139	128	151	371	1,890	12,750	1,940	110	18	420

Calendar year 1960: Max 558 Min 0.5 Mean 45.9 Ac-ft 33,290  
Water year 1960-61: Max 328 Min 0 Mean 25.0 Ac-ft 18,110

Peak discharge (base, 800 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice or backwater from beaver dam Oct. 1 to May 1. No gage-height record Oct. 8-26, Dec. 23 to Mar. 2, Mar. 27, 28.

GREEN RIVER BASIN

9-2455. North Fork Elkhead Creek near Elkhead, Colo.

Location.--Lat 40°40'50", long 107°17'10", in NW¼ sec.5, T.8 N., R.88 W., on right bank 70 ft upstream from small tributary, 0.8 mile upstream from mouth, and 13 miles north of Hayden.

Drainage area.--21 sq mi, approximately.

Records available.--January to November 1910 and May to November 1920 (monthly discharge only, published in WSP 1313; published as "at Hayes Ranch"), October 1958 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,990 ft (from topographic map). January to November 1910 and May to September 1920, staff gage and October to November 1920, water-stage recorder, at site 0.6 mile downstream at different datum.

Extremes.--Maximum discharge during year, 190 cfs May 11 (gage height, 3.68 ft). from rating curve extended above 81 cfs; no flow for many days.  
1910, 1920, 1958-61: Maximum daily discharge, 542 cfs May 19, 1920; maximum gage height, 4.45 ft Mar. 24, 1960; no flow at times in 1910, 1959-61.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of about 100 acres of hay meadows.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	0	2.3	7.8
1.8	.1	2.4	13
1.9	.3	2.7	35
2.0	1.2	3.0	67
2.1	2.6	3.3	110
2.2	4.6		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	1.0	1.4	1.8		2.0	3.0	63	3.0	0.6	0.3	0
2	.3	1.4	1.4	1.8		* 2.0	3.2	* 79	2.7	.4	.8	.5
3	.5	1.8	1.6	1.6		2.0	3.2	67	2.4	.4	1.0	1.2
4	.3	1.8	1.6	1.6		2.2	3.4	59	2.1	.4	.2	.8
5	.4	1.2	1.8	1.6		2.2	3.6	52	* 19	.4	.2	.6
6	.5	1.2	1.8			2.2	3.8	37	1.9	.3	.1	.8
7	.7	1.2	* 1.6			2.4	4.0	29	1.6	.2	0	.2
8	.6	1.4	1.4			2.2	4.2	28	1.5	.2	0	1
9	.8	1.6	1.4			2.2	4.4	39	1.4	.2	0	.7
10	1.3	1.6	1.4			2.2	4.6	74	1.2	.2	0	.9
11	2.5	1.6	1.4			2.4	4.4	107	1.1	.1	0	.6
12	2.0	1.4	1.2			2.6	4.6	107	9.4	.1	0	.2
13	1.3	1.2	1.2			2.6	4.4	70	7.8	.1	0	* 1
14	1.6	1.2	1.4			2.8	4.2	48	6.8	0	0	.2
15	1.3	1.2	1.2			3.0	3.8	65	5.6	0	0	.2
16	1.5	1.2	1.4		1.5	2.8	4.6	70	5.2	0	0	.4
17	1.6	1.2	1.8			2.8	6.8	66	4.9	0	0	.9
18	1.6	* 1.2	2.0	1.6		3.0	* 11	76	4.9	0	* 0	1.6
19	1.6	1.2	2.2			2.8	20	90	4.4	0	0	2.6
20	1.3	1.4	2.2			3.0	30	87	3.8	0	0	1.9
21	1.1	1.2	2.2			3.0	20	84	3.4	* 0	0	3.0
22	1.1	1.0	2.2			2.8	22	* 91	* 2.8	.4	0	3.6
23	1.1	1.0	2.2			2.8	25	84	2.3	.2	0	2.8
24	1.1	1.0	2.2			2.8	19	70	1.9	.1	0	2.5
25	1.1	1.2	2.2			3.0	14	59	1.6	.2	0	2.2
26	* 1.0	1.2	2.2			2.8	11	59	1.3	0	0	3.4
27	1.1	1.0	2.0			2.8	12	57	1.1	0	0	4.2
28	1.0	1.2	2.0			2.8	24	51	.8	0	0	4.4
29	1.2	1.4	2.0			2.6	43	46	.8	0	0	12
30	.8	1.4	2.0			2.6	54	40	.8	0	0	5.6
31	1.0	-----	2.0		-----	2.8	-----	34	-----	1.2	0	-----
Total	33.5	38.6	54.6	50.0	42.0	80.2	375.2	1988	277.6	5.7	2.6	58.2
Mean	1.08	1.29	1.76	1.61	1.5	2.59	12.5	64.1	9.25	0.18	0.08	1.94
Ac-ft	66	77	108	99	83	159	744	3,940	551	11	5.2	115

Calendar year 1960: Max 174 Min 0 Mean 16.2 Ac-ft 11,780  
Water year 1960-61: Max 107 Min 0 Mean 8.24 Ac-ft 5,960

Peak discharge (base, 200 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Nov. 2, Nov. 5 to Apr. 15 (no gage-height record Jan. 6 to Mar. 2).



9-2486. East Fork of Williams Fork above Willow Creek, Colo.

Location.--Lat 40°15'40", long 107°17'35", in NE $\frac{1}{4}$  sec.5, T.3 N., R.88 W.,  $3\frac{1}{2}$  miles south of Willow Creek store, 3.8 miles upstream from Willow Creek, and 16 miles south of Hayden.

Drainage area.--108 sq mi.

Records available.--October 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,100 ft (from topographic map).

Average discharge.--5 years, 119 cfs (86,150 acre-ft per year).

Extremes.--Maximum discharge during year, 866 cfs May 30 (gage height, 6.00 ft); minimum daily, 18 cfs Feb. 27.

1956-61: Maximum discharge, about 1,500 cfs June 25, 1957; maximum gage height, 6.84 ft June 9, 1957; minimum daily discharge determined, 18 cfs Feb. 27, 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 800 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.5	22	5.0	305
3.7	37	5.5	510
4.0	75	6.0	810
4.5	165		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	* 38	34	32	* 20	24	32	170	608	101	45	42
2	28	31	34	32	20	25	32	222	596	92	* 45	48
3	28	34	32	32	22	25	32	* 205	495	89	44	56
4	* 28	35	30	* 32	24	26	30	195	416	90	37	55
5	28	33	30	32	24	26	* 30	185	424	85	38	68
6	28	31	28	32	22	26	35	130	412	80	36	84
7	28	37	26	30	20	27	35	110	* 436	75	34	77
8	29	35	28	30	22	24	35	106	456	75	33	69
9	30	34	30	30	24	24	31	121	485	70	34	89
10	31	36	28	30	26	26	32	218	510	65	32	62
11	35	38	28	30	24	24	31	396	500	* 65	32	49
12	35	40	28	28	22	24	31	428	470	60	31	44
13	33	38	28	28	22	26	35	348	420	58	33	41
14	34	35	30	28	24	26	31	215	372	56	34	* 39
15	34	31	32	30	26	31	31	195	319	55	32	39
16	35	37	28	32	26	31	31	192	280	53	36	39
17	35	38	34	30	24	31	36	178	270	48	48	41
18	35	38	34	28	22	31	* 58	208	258	50	34	47
19	33	34	32	26	24	28	90	319	240	60	31	59
20	34	36	32	24	26	28	99	436	225	58	31	59
21	32	36	34	26	24	26	69	495	* 202	54	38	74
22	34	36	32	26	22	28	69	540	185	53	33	85
23	33	36	30	26	20	31	75	550	165	45	* 31	87
24	33	34	28	26	22	36	63	* 490	156	42	31	78
25	31	34	28	24	24	36	56	470	144	38	53	72
26	31	34	28	24	20	32	52	520	133	39	87	85
27	33	32	28	22	18	30	55	550	126	40	46	92
28	30	30	28	20	* 22	28	69	535	119	42	38	115
29	28	32	28	24	-	28	108	578	108	47	35	156
30	28	* 34	28	22	-----	30	141	668	108	52	38	114
31	34	-----	30	20	-----	32	-----	626	-----	46	44	-----
Total	976	1,047	928	856	636	870	1,554	10,599	9,638	1,883	1,194	2,065
Mean	31.5	34.9	29.9	27.6	22.7	28.1	51.8	342	321	60.7	38.5	68.8
Ac-ft	1,940	2,080	1,840	1,700	1,260	1,730	3,080	21,020	19,120	3,730	2,370	4,100

Calendar year 1960: Max 704 Min 20 Mean 103 Ac-ft 74,710  
 Water year 1960-61: Max 668 Min 18 Mean 88.3 Ac-ft 63,970

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-11	8p.m.	5.63	602	5-30	7p.m.	6.00	866
5-22	8:30p.m.	5.82	740	6-9	8:30p.m.	5.74	692

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 10, 11, 17, 18, Nov. 20 to Mar. 1, Mar. 8-14, 19-22. No gage-height record Oct. 2, 3, Dec. 13 to Feb. 28, Mar. 27 to Apr. 5, July 4-11.

9-2490. East Fork of Williams Fork near Pagoda, Colo.

Location.--Lat 40°18'45", long 107°19'15", in SW $\frac{1}{4}$  sec.18, T.4 N., R.88 W., on right bank 20 ft downstream from private road bridge, half a mile upstream from Dowden Gulch,  $1\frac{1}{4}$  miles downstream from Willow Creek, and  $5\frac{1}{2}$  miles southeast of Pagoda.

Drainage area.--150 sq mi, approximately.

Records available.--October 1953 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,830 ft (from topographic map).

Average discharge.--8 years, 112 cfs (81,080 acre-ft per year).

Extremes.--Maximum discharge during year, 758 cfs May 30 (gage height, 3.38 ft); minimum daily, 20 cfs Feb. 28.

1953-61: Maximum discharge, 1,620 cfs June 26, 1957; maximum gage height, 4.82 ft June 6, 1957; minimum daily discharge, 12 cfs Aug. 28, Sept. 22, 1954.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 900 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 17-19)

Oct. 1 to Mar. 18

Mar. 19 to Sept. 30

1.5 20  
1.8 48

1.5 24  
1.8 56  
2.2 124

2.6 240  
3.0 430  
3.3 670

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	*36	34	34	*22	22	30	177	580	102	44	46
2	26	30	34	34	24	24	32	233	572	88	*45	51
3	26	31	34	34	26	26	34	*248	472	85	48	61
4	*26	31	32	*34	28	26	34	237	412	86	39	59
5	26	28	28	34	28	26	*36	240	406	82	40	64
6	26	27	28	34	26	26	45	171	400	77	38	86
7	26	35	30	34	24	26	49	137	*430	75	35	83
8	27	35	30	32	26	24	48	131	437	74	34	74
9	27	32	32	32	28	24	38	139	465	69	36	93
10	29	34	32	32	28	26	38	230	500	64	34	70
11	32	38	30	32	28	26	36	370	500	*62	34	54
12	34	41	30	32	26	26	37	444	465	61	33	48
13	32	41	30	32	24	26	44	406	406	59	36	45
14	33	32	32	32	26	30	36	270	360	56	36	*42
15	32	37	34	34	26	32	38	248	320	54	34	41
16	33	41	34	34	28	32	35	240	282	50	34	43
17	35	44	36	34	26	32	43	223	274	45	54	44
18	34	44	36	32	26	32	*72	244	259	43	35	48
19	31	44	36	30	26	30	101	335	244	42	32	66
20	32	32	36	26	28	30	117	458	230	43	30	67
21	31	44	36	28	28	30	86	500	*206	50	39	85
22	33	47	36	28	26	32	80	*508	180	52	34	110
23	31	42	34	28	24	36	93	524	163	43	*32	108
24	31	41	32	28	24	38	78	508	149	40	31	97
25	28	40	32	28	26	38	66	479	137	38	49	85
26	27	39	32	28	24	38	59	524	126	39	90	99
27	31	41	32	26	22	38	62	532	119	40	49	108
28	26	40	32	24	*20	34	78	524	115	39	40	128
29	25	30	32	26	-	32	110	532	104	43	37	209
30	26	*30	32	26	-----	30	142	625	104	54	41	139
31	30	-----	34	24	-----	30	-----	580	-----	45	45	-----
Total	912	1107	1012	946	718	922	1797	11017	9417	1800	1238	2353
Mean	29.4	36.9	32.6	30.5	25.6	29.7	59.9	355	314	58.1	39.9	78.4
Ac-ft	1,810	2,200	2,010	1,880	1,420	1,830	3,560	21,850	18,680	3,570	2,460	4,670

Calendar year 1960: Max 692 Min 20 Mean 111 Ac-ft 80,380  
Water year 1960-61: Max 625 Min 20 Mean 91.1 Ac-ft 65,940

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-11	10p.m.	3.15	540	6-9	10p.m.	3.26	634
5-30	10:30p.m.	3.38	758				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 10, 11, 18, 20, 21, Nov. 29 to Apr. 5 (no gage-height record Jan. 4-31, Mar. 19 to Apr. 5).

## GREEN RIVER BASIN

279

9-2500. Milk Creek near Thornburg, Colo.

Location.--Lat 40°12', long 107°44', in NE $\frac{1}{4}$  sec.32, T.3 N., R.92 W., on right bank 2 $\frac{1}{2}$  miles northwest of Thornburg and 5 miles upstream from Little Creek.

Drainage area.--65 sq mi, approximately.

Records available.--October 1952 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,450 ft (by barometer).

Average discharge.--9 years, 21.3 cfs (15,420 acre-ft per year).

Extremes.--Maximum discharge during year, 217 cfs May 12 (gage height, 3.89 ft); minimum daily, 0.8 cfs Aug. 29, 30.

1952-61: Maximum discharge, 491 cfs May 10, 1957; maximum gage height, 5.52 ft June 1, 1957; minimum daily discharge, 0.2 cfs Oct. 5-7, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,000 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

2.0	0.3	2.0	0.3	2.8	39
2.1	1.0	2.1	1.0	3.0	60
2.2	2.7	2.2	2.9	3.5	145
2.4	8.0	2.3	5.8	3.7	185
		2.5	16		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	*2.2	2.4	2.8	2.6	3.6	10	66	82	7.5	2.7	2.0
2	1.2	2.2	2.4	2.6	2.6	3.8	10	94	71	7.1	*2.7	2.9
3	1.2	2.2	2.6	2.6	2.8	3.8	10	*108	60	6.2	*3.5	6.6
4	*1.0	2.0	2.6	*2.6	2.8	3.6	15	93	53	5.5	4.4	6.2
5	.9	2.0	2.4	2.8	2.6	3.6	*10	101	46	4.9	5.8	5.2
6	.9	1.8	2.2	2.8	2.4	3.6	*9.6	71	42	4.4	2.5	3.5
7	.9	2.7	2.2	2.6	2.4	3.4	9	58	*41	5.2	2.3	3.2
8	.9	3.2	2.4	2.6	2.6	3.2	7.5	58	41	6.2	2.1	2.9
9	1.2	2.5	2.6	2.8	2.6	3.2	9.2	60	37	6.2	2.0	2.7
10	1.5	2.0	2.6	2.8	2.6	3.4	8.7	93	34	6.2	2.0	2.7
11	2.4	2.0	2.4	2.6	2.8	3.6	7.5	157	31	*6.6	1.8	2.7
12	2.4	2.4	2.4	2.6	2.8	3.8	8.3	181	29	6.2	2.1	2.1
13	1.8	2.2	2.4	2.6	2.8	4.0	12	175	21	5.8	2.1	1.6
14	1.8	2.2	2.6	2.6	2.6	5.0	10	129	17	4.9	2.9	1.4
15	1.8	2.2	2.6	2.8	2.6	5.0	9	131	14	3.2	2.1	1.4
16	1.8	2.0	2.4	2.8	2.8	5.0	11	135	14	2.9	2.0	1.4
17	1.8	2.2	2.4	2.6	3.0	4.8	27	122	15	2.3	2.0	1.4
18	1.8	2.2	2.6	2.6	2.8	4.6	*3.4	123	14	2.1	2.1	*2.0
19	1.8	2.4	2.8	2.4	2.8	4.4	3.6	159	14	2.1	1.8	5.8
20	1.8	2.2	2.8	2.4	3.0	4.6	4.4	167	14	2.0	1.2	4.9
21	1.8	2.2	2.6	2.4	3.2	5.0	33	159	*1.4	1.8	1.2	6.2
22	1.8	2.4	2.6	2.6	3.2	5.5	27	155	10	1.8	1.2	2.0
23	2.0	2.4	2.8	2.6	3.0	5.5	33	161	10	1.6	*1.0	1.5
24	2.2	2.2	2.8	2.8	3.0	5.5	30	*1.45	11	2.0	1.0	1.9
25	2.0	2.4	2.6	2.8	3.2	5.0	24	123	12	2.0	1.6	1.9
26	1.7	2.2	2.4	2.6	3.2	4.6	20	143	11	1.8	2.3	1.4
27	1.7	2.5	2.4	2.4	3.0	4.4	20	133	7.5	2.0	1.6	1.2
28	2.0	2.2	2.4	2.4	*3.2	4.4	27	127	8.3	1.8	1.0	1.0
29	2.2	2.0	2.6	2.6	-	4.6	43	111	6.2	1.6	.8	1.6
30	1.8	*2.4	2.8	*2.6	-----	5.5	60	111	7.1	2.0	.8	2.0
31	2.0	-----	2.8	2.6	-----	5.5	-----	96	-----	2.5	1.4	-----
Total	51.1	67.7	78.6	81.4	79.0	136.5	614.8	3745	787.1	118.4	64.0	213.8
Mean	1.65	2.26	2.54	2.63	2.82	4.40	20.5	121	26.2	3.82	2.06	7.13
Ac-ft	101	134	156	161	157	271	1,220	7,430	1,560	235	127	424

Calendar year 1960: Max 199 Min 0.9 Mean 22.3 Ac-ft 16,200

Water year 1960-61: Max 181 Min 0.8 Mean 16.5 Ac-ft 11,980

Peak discharge (base, 250 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16, 18, 20, 21, 28, Dec. 1 to Mar. 31, Apr. 7, 13-15.

## GREEN RIVER BASIN

9-2510. Yampa River near Maybell, Colo.

Location.--Lat 40°30'10", long 108°01'45", in NW¼ sec.2, T.6 N., R.95 W., on left bank 100 ft downstream from bridge on U. S. Highway 40, 2 miles downstream from Lay Creek, and 3 miles east of Maybell.

Drainage area.--3,410 sq mi, approximately.

Records available.--April 1904 to October 1905, June 1910 to November 1912, April 1916 to September 1961. Monthly discharge only for some periods, published in WSP 1313. No winter records prior to 1917.

Gage.--Water-stage recorder. Datum of gage is 5,900.23 ft above mean sea level, datum of 1929. Prior to Apr. 24, 1916, staff or chain gage at Thornburgh Bridge 14 miles downstream at different datum. Apr. 24, 1916, to Nov. 3, 1917, chain gage and Nov. 4, 1917, to Mar. 8, 1937, water-stage recorder, at site 700 ft downstream, at datum 0.92 ft higher prior to Oct. 1, 1932, and at present datum thereafter.

Average discharge.--45 years (1916-61), 1,560 cfs (1,129,000 acre-ft per year).

Extremes.--Maximum discharge during year, 6,350 cfs May 31 (gage height, 6.55 ft); minimum daily, 75 cfs Aug. 23, 24.

1904-5, 1910-12, 1916-61: Maximum discharge observed, 17,900 cfs May 19, 1917 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 12,000 cfs; minimum daily, 2 cfs July 17-19, 1934.

Remarks.--Records good except those for periods of ice effect, which are poor. Natural flow of stream affected by transbasin diversions, numerous storage reservoirs, and diversions above station for irrigation of about 65,000 acres above and about 800 acres below station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 6-9)

1.2	73	2.0	325	4.0	2,060
1.4	115	2.5	600	5.0	3,640
1.7	205	3.0	950	6.5	6,350

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	138	205	180	190	180	210	480	1,530	5,620	866	*236	81
2	135	194	190	190	200	220	588	1,960	5,500	817	236	91
3	135	230	200	190	210	210	726	*2,700	5,390	726	248	146
4	138	256	210	180	210	210	*803	3,040	5,050	649	256	230
5	138	252	210	170	200	210	1,280	2,940	4,250	588	254	294
6	*135	252	210	*170	200	210	1,030	2,780	4,010	552	244	307
7	135	268	200	170	200	200	*929	2,240	*3,950	552	208	340
8	135	280	210	180	210	170	852	1,770	4,200	492	174	410
9	140	289	220	190	220	180	691	1,550	4,420	447	158	480
10	149	312	230	200	230	200	677	1,530	4,600	415	132	486
11	155	280	230	210	230	190	635	2,270	4,630	405	120	469
12	177	240	220	220	210	200	588	3,860	4,420	360	122	425
13	188	236	210	230	210	210	570	4,780	4,220	*330	115	350
14	219	280	200	240	210	220	831	4,630	3,960	289	113	*294
15	233	312	180	240	220	220	901	3,470	3,640	236	85	260
16	240	298	180	240	*230	230	705	3,360	3,200	202	81	233
17	256	260	180	220	240	250	*600	3,360	3,100	184	89	226
18	256	250	200	200	230	300	698	3,040	2,860	177	83	233
19	256	250	220	190	210	350	901	3,010	2,650	167	85	302
20	260	240	220	190	220	360	1,440	3,610	*2,400	125	85	395
21	260	210	230	200	230	350	2,180	4,440	2,510	132	85	552
22	248	260	240	200	220	370	1,690	*4,810	2,340	128	81	796
23	240	270	250	200	210	440	1,280	5,300	2,080	180	*75	1,020
24	233	270	250	210	220	520	1,410	5,560	1,870	380	75	1,050
25	230	260	240	220	230	500	1,250	*5,300	1,570	302	79	990
26	222	268	230	220	220	460	1,080	5,320	1,480	252	83	915
27	222	268	220	210	200	470	950	5,790	1,260	222	79	887
28	212	*272	200	190	220	480	859	5,860	1,060	212	108	936
29	212	180	190	180	-	490	831	5,860	1,010	194	91	1,080
30	212	180	190	170	-----	498	990	5,660	901	233	97	1,740
31	*212	-----	200	*170	-----	458	-----	6,150	-----	233	87	-----
Total	6.121	7.622	6.540	6.180	6.020	9.586	284.45	117.480	981.51	110.47	40.74	160.13
Mean	197	254	211	199	215	309	948	3,790	3,272	356	131	534
Ac-ft	12,140	15,120	12,970	12,260	11,940	19,010	56,420	233,000	194,700	21,910	8,080	31,770

Calendar year 1960: Max 7,810 Min 45

Water year 1960-61: Max 6,150 Min 75

Mean 1,315

Mean 869

Ac-ft 954,800

Ac-ft 629,300

Peak discharge (base, 7,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17-25, Nov. 29 to Mar. 29.



9-2530. Little Snake River near Slater, Colo.

Location---Lat 41°00', long 107°09', in SW  $\frac{1}{4}$  sec. 15, T.12 N., R.87 W., on left bank just downstream from highway bridge at Focus Ranch, a quarter of a mile downstream from Willow Creek and 11 miles east of Slater.

Drainage area---285 sq mi.

Records available---October 1942 to September 1947, October 1950 to September 1961.

Gage---Water-stage recorder. Datum of gage is 6,831.00 ft above mean sea level, datum of 1929.

Average discharge---16 years, 211 cfs (152,800 acre-ft per year).

Extremes---Maximum discharge during year, 1,350 cfs May 25 (gage height, 6.46 ft); minimum daily, 12 cfs Oct. 1, 2, 4.

1942-47, 1950-61: Maximum discharge, 3,230 cfs June 7, 1957 (gage height, 8.27 ft); minimum daily, 8.6 cfs Sept. 10, 1944.

Remarks---Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 2,000 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.2	11	4.5	198
3.4	18	4.8	310
3.6	31	5.1	460
3.9	68	5.5	680
4.2	118	6.3	1,270

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	23	30	20	22	*34	54	385	1,090	92	75	54
2	12	20	30	20	22	35	62	500	1,060	82	60	68
3	13	21	30	18	22	34	90	*500	995	73	60	74
4	12	25	28	18	22	34	110	440	890	73	39	75
5	13	22	28	*18	20	34	96	385	862	79	33	76
6	13	20	28	18	20	34	84	305	*869	75	31	81
7	13	30	28	20	22	35	72	262	813	72	30	62
8	13	28	*28	20	24	38	74	244	827	81	30	38
9	14	24	28	20	26	44	67	296	827	71	32	46
10	21	24	28	20	28	50	61	566	820	68	32	61
11	23	26	28	22	28	50	57	904	757	68	30	40
12	29	27	28	22	28	55	60	1,000	687	62	30	28
13	24	25	26	22	26	55	76	799	620	50	33	*29
14	24	25	26	22	24	60	65	540	566	50	37	28
15	24	26	28	22	26	60	51	584	515	64	28	28
16	26	28	32	20	26	60	60	596	445	50	*24	28
17	26	*28	32	20	28	60	62	525	400	46	30	54
18	24	28	30	20	28	60	85	644	340	44	27	49
19	22	26	28	20	28	65	*140	736	301	*35	23	74
20	20	26	26	20	28	70	227	876	*310	35	23	65
21	18	26	26	20	26	75	154	925	240	74	29	78
22	17	26	28	20	26	80	162	1,010	208	71	30	90
23	17	26	28	22	26	85	198	*1,010	180	46	28	81
24	*17	28	28	*24	26	90	151	981	165	37	25	78
25	17	28	26	25	28	*80	122	1,050	148	37	35	74
26	17	28	26	22	26	70	108	1,150	131	39	32	85
27	18	28	24	16	28	55	105	1,140	118	51	35	99
28	17	26	22	18	32	44	131	1,130	112	51	30	107
29	18	26	20	20	-	44	220	1,150	103	41	33	258
30	16	30	18	22	-----	46	310	1,210	97	51	48	180
31	16	-----	20	22	-----	48	-----	1,130	-----	72	37	-----
Total	566	774	836	634	716	1,686	3,314	22,974	15,496	1,850	1,069	2,188
Mean	18.3	25.8	27.0	20.5	25.6	54.4	110	741	59.7	34.5	34.5	72.9
Ac-ft	1,120	1,540	1,660	1,260	1,420	3,340	6,570	45,570	30,740	3,670	2,120	4,540

Calendar year 1960: Max 1,460 Min 11 Mean 185 Ac-ft 134,600

Water year 1960-61: Max 1,210 Min 12 Mean 143 Ac-ft 103,400

Peak discharge (base, 1,600 cfs)---No peak above base.

\* Discharge measurement made on this day.

Note---Stage-discharge relation affected by ice Oct. 30, 31, Nov. 9-11, Nov. 15 to Mar. 31. No gage-height record Oct. 14-24, Feb. 11 to Mar. 1.

## GREEN RIVER BASIN

9-2550. Slater Fork near Slater, Colo.

Location.--Lat 40°59', long 107°23', in SW $\frac{1}{4}$  sec.21, T.12 N., R.89 W., on right bank 25 ft downstream from highway bridge, 1 mile upstream from mouth, and 1 $\frac{1}{2}$  miles south of Slater.

Drainage area.--161 sq mi.

Records available.--May to October, December 1910, March to October 1911, and April to May 1912 (published as Slater Creek), July 1931 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 6,600 ft (from river-profile map). May 28, 1910, to May 25, 1912, staff gage at site 1 $\frac{1}{2}$  miles upstream at different datum. July 9, 1931, to May 6, 1932, chain gage at site a quarter of a mile downstream at different datum.

Average discharge.--30 years (1931-61), 70.5 cfs (51,040 acre-ft per year).

Extremes.--Maximum discharge during year, 572 cfs May 12 (gage height, 6.11 ft); minimum daily, 0.9 cfs July 18, 19. 1910-12, 1931-61: Maximum discharge observed, 1,700 cfs May 19, 1912 (gage height, 5.00 ft, site and datum then in use); no flow Aug. 2-10, 1934, Aug. 18, 25-27, 1936, Aug. 29 to Sept. 3, 1954.

Remarks.--Records fair except those for periods of ice effect, which are poor. Diversions for irrigation of about 500 acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	10	12	11	12	*15	26	141	160	5.9	3.9	17
2	3.6	11	12	11	11	13	28	*221	144	6.9	6.0	24
3	3.9	11	11	11	11	12	40	225	123	6.8	7.8	20
4	4.7	11	11	12	10	12	45	180	116	6	7.1	17
5	5.8	10	12	*12	9	12	40	154	111	7.8	6.1	15
6	4.2	10	13	12	9	11	30	116	*125	9.8	5.2	18
7	3.9	10	14	12	10	10	28	102	120	12	1.7	13
8	4.4	10	*14	12	11	8	26	90	124	7.6	1.3	9.0
9	5.8	10	14	11	12	8	26	119	117	11	1.2	9.6
10	6.8	9.5	14	11	13	10	24	241	116	9.0	1.0	17
11	12	10	14	11	13	12	25	362	111	9.6	1.0	12
12	13	11	13	12	12	13	25	371	102	8.3	13	9.6
13	11	12	12	12	11	14	33	287	86	7.9	4.7	*8.5
14	12	13	11	11	10	15	29	165	73	6.9	3.1	7.9
15	11	13	11	11	10	16	23	186	66	6.0	2.0	7.6
16	11	14	11	11	11	16	27	210	56	2.0	2.4	6.6
17	10	*14	11	11	11	17	28	174	51	1.7	*3.8	5.3
18	11	11	12	11	10	18	40	178	48	.9	5.8	8.8
19	11	9	12	10	10	19	*65	203	44	.9	5.8	18
20	10	6.5	11	10	11	20	104	231	*40	*1.6	4.8	18
21	9.2	9	10	11	12	20	69	211	35	1.6	6.4	25
22	8.8	9.5	11	12	12	19	57	221	28	4.1	7.8	35
23	8.7	10	12	12	11	19	75	*222	24	3.6	7.8	28
24	*9.2	11	12	*12	10	20	57	207	20	3.1	7.6	27
25	9.6	12	11	10	11	22	44	177	17	3.1	11	24
26	9.2	12	10	7	12	24	35	182	13	3.2	13	26
27	8.8	11	10	6	13	*27	35	194	12	2.7	13	32
28	9.0	10	10	7	15	27	44	192	10	3.1	12	31
29	9.4	10	11	9	-	26	98	178	9.8	2.5	12	6.8
30	7	11	12	11	-----	26	132	195	7.8	1.0	14	60
31	9	-----	12	12	-----	26	-----	166	-----	1.6	15	-----
Total	257.1	321.5	366	334	313	527	1,358	6,101	2,109.6	159.2	207.1	618.9
Mean	8.29	10.7	11.8	10.8	11.2	17.0	45.3	197	70.3	5.14	6.68	20.6
Ac-ft	510	638	726	662	621	1,050	2,690	12,100	4,180	316	411	1,230

Calendar year 1960: Max 420 Min 0.8 Mean 56.5 Ac-ft 41,050

Water year 1960-61: Max 371 Min 0.9 Mean 34.7 Ac-ft 25,130

Peak discharge (base, 430 cfs).--May 12 (3 a.m.) 572 cfs (6.11 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30 to Mar. 26, Mar. 29 to Apr. 10.

9-2580. Willow Creek near Dixon, Wyo.

Location.--Lat 40°55'00", long 107°31'10", in SW $\frac{1}{4}$  sec.8, T.11 N., R.90 W., in Colorado on right bank 6 miles south of Colorado-Wyoming State line, 7 miles south of Dixon, and 8 miles upstream from mouth.

Drainage area.--24 sq mi, approximately.

Records available.--October 1953 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,700 ft (from topographic map).

Average discharge.--8 years, 8.60 cfs (6,230 acre-ft per year).

Extremes.--Maximum discharge during year, 42 cfs June 9 (gage height, 3.31 ft); maximum gage height, 4.66 ft Mar. 15 (backwater from ice); minimum daily discharge, 0.4 cfs Aug. 29.

1953-61: Maximum discharge, 195 cfs May 10, 1957 (gage height, 4.97 ft); no flow Sept. 17-19, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversion above station. Regulation by Elk Lake (capacity, 400 acre-ft).

Fating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 10-24)

1.9	0.3	2.5	8.4
2.0	.8	2.7	14
2.1	1.7	3.0	29
2.3	4.6	3.5	59

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	1.7	1.4	1.2		*2.8	5	7.8	2.6	3.7	6.8	1.8
2	1.7	1.5	1.4	1.2		3.0	6	*9.9	2.6	3.1	6.0	2.8
3	1.8	1.6	1.2	1.0		2.8	6	11	2.0	2.7	3.8	3.1
4	1.8	1.6	1.2	1.0		2.6	5.5	10	2.0	2.7	3.2	2.5
5	2.0	1.4	1.4	1.2		2.4	5	8.8	*22	2.7	3.0	2.4
6	2.0	1.4	1.4	*1.2		2.2	4.4	6.4	2.6	2.3	2.2	3.2
7	2.0	1.6	1.2	1.2		2.0	4.0	5.5	2.9	2.4	1.4	2.1
8	2.1	1.6	1.2	1.2	2.6	1.8	4.2	5.9	3.1	4.4	1.2	1.7
9	2.1	1.4	*1.4	1.4		2.0	3.8	5.9	3.3	4.4	1.0	3.2
10	3.0	1.4	1.4	1.6		2.2	3.4	9.9	3.4	4.3	1.0	3.6
11	4.2	1.6	1.4	1.6		2.4	3.0	20	3.6	4.2	1.2	2.1
12	3.0	1.8	1.4	1.8		2.4	3.2	13	3.2	4.2	1.6	1.7
13	2.0	1.7	1.2	2.0		2.4	3.2	16	2.8	4.0	2.4	*1.4
14	2.1	1.6	1.2	2.0		2.4	3.0	7.6	2.6	4.0	3.2	1.3
15	1.8	1.6	1.2	2.2		2.6	2.8	8.2	2.4	4.0	3.6	1.3
16	1.8	*1.4	1.4	2.0		2.6	2.8	9.5	2.2	3.8	3.8	1.5
17	2.3	1.4	1.6	1.8		2.6	3.2	8.2	2.0	2.8	*3.8	1.2
18	2.3	1.6	1.6	1.6		2.4	*8.0	7.8	2.0	3.2	1.5	1.6
19	2.3	1.6	1.4	1.6		2.4	16	8.8	1.6	3.6	1.1	3.0
20	2.0	1.4	1.2	1.8		2.4	14	9.9	1.4	*3.1	1.0	2.7
21	1.8	1.4	1.0	2.0		2.4	7.2	9.7	*12	3.7	1.2	4.6
22	1.8	1.4	1.0	2.2	2.8	2.6	6.2	*11	*10	3.2	1.2	5.1
23	2.0	1.6	1.0	2.4		2.8	7.2	13	9.1	2.7	1.0	4.0
24	*2.0	1.8	1.0	*2.6		3.4	5.5	13	7.8	2.5	.8	3.8
25	1.8	1.8	1.2	2.4		3.8	4.2	13	6.8	2.8	1.4	2.8
26	2.0	1.4	1.2	2.2		3.8	3.4	17	6.0	2.4	1.2	3.1
27	1.6	1.2	1.2	1.2		*3.8	3.1	20	5.3	2.3	.7	3.4
28	1.6	1.0	1.0	.8		3.6	3.7	24	5.0	2.3	.6	3.6
29	1.6	1.0	1.0	1.2		3.2	6.4	22	4.6	2.1	.4	11
30	1.0	1.2	1.0	2.0		3.0	8.6	23	4.0	2.5	1.0	6.2
31	1.8	-----	1.0	2.4	-----	4.0	-----	25	-----	9.5	1.4	-----
Total	62.8	44.7	38.4	52.0	75.4	84.8	162.0	391.8	574.6	105.4	63.7	91.8
Mean	2.03	1.49	1.24	1.68	2.69	2.74	5.40	12.6	19.2	3.40	2.05	3.06
Ac-ft	125	89	76	103	150	168	321	777	1,140	209	126	182

Calendar year 1960: Max 60 Min 0.7 Mean 8.30 Ac-ft 6,030

Water year 1960-61: Max 36 Min 0.4 Mean 4.79 Ac-ft 3,470

Peak discharge (base, 70 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 5-11, Nov. 15 to Apr. 14. No gage-height record Jan. 27 to Mar. 1, Aug. 5-17.

## GREEN RIVER BASIN

9-2600. Little Snake River near Lily, Colo.

Location.--Lat 40°32', long 108°25', in sec.20, T.7 N., R.98 W., on left bank 170 ft downstream from highway bridge, 6 miles north of Lily, and 10 miles upstream from mouth.

Drainage area.--3,730 sq mi, approximately.

Records available.--June to August 1904, October 1921 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "near Maybell" 1904.

Gage.--Water-stage recorder. Altitude of gage is 5,685 ft (from river-profile map). June 9 to Aug. 14, 1904, chain gage and May 5, 1922, to Nov. 30, 1935, water-stage recorder, at site 300 ft upstream at different datums.

Average discharge.--40 years (1921-61), 565 cfs (409,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,900 cfs May 13 (gage height, 3.69 ft); no flow for many days in October, July, August. 1904, 1921-61: Maximum discharge, 14,200 cfs May 27, 1926 (gage height, 10.5 ft, site and datum then in use), from rating curve extended above 3,600 cfs; no flow at times in many years.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 21,000 acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 17 to May 4)

0.2	0	0.6	11	2.0	370
.3	.4	.8	30	2.5	705
.4	1.8	1.0	66	3.0	1,170
.5	5.5	1.5	185	3.5	1,720

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	13	46	34	30	120	246	317	1,640	51	*0	25
2	0	19	48	34	32	130	334	*565	1,580	29	0	13
3	0	20	46	*34	34	120	325	681	1,530	19	16	16
4	0	23	46	34	36	130	*285	975	1,520	13	0	8.8
5	0	23	46	32	38	140	325	984	*1,380	10	0	12
6	*0	29	40	30	40	160	649	825	1,260	6.0	0	12
7	0	45	44	32	40	170	*515	756	1,220	4.4	0	7.7
8	0	50	46	34	38	179	415	588	1,250	2.9	0	2.9
9	0	55	48	36	40	185	330	474	1,150	1.7	0	6.6
10	0	55	50	38	42	188	285	395	1,130	*1.4	0	8.8
11	181	50	50	40	44	194	264	334	1,110	1.0	0	7.7
12	182	50	48	42	46	179	240	665	1,090	1.1	0	6.0
13	194	55	46	42	48	203	222	1,470	1,030	1.0	0	5.5
14	197	55	46	42	46	212	209	1,420	928	1.4	4.4	*6.0
15	42	50	46	42	48	236	205	1,190	825	1.4	.4	4.8
16	26	46	44	40	50	254	271	899	739	.4	2.8	3.6
17	18	46	42	38	55	330	*226	975	673	.3	1.9	4.0
18	17	46	44	36	60	420	185	1,070	595	.2	5.5	4.4
19	16	44	48	36	55	558	194	937	508	.1	1.2	8.2
20	17	44	44	36	60	610	197	918	*438	0	.2	10
21	15	44	40	36	65	480	285	1,120	395	0	*6.2	4.6
22	12	48	42	38	70	321	543	*1,270	356	0	3.5	173
23	10	50	44	38	75	317	456	1,240	334	0	5.1	173
24	9.0	50	44	40	70	285	370	*1,370	278	0	13	271
25	10	50	44	42	80	274	450	1,340	212	0	5.1	197
26	13	48	42	40	90	395	420	1,250	173	0	2.6	158
27	17	46	38	38	*80	610	348	1,330	161	0	8.8	140
28	17	*44	36	34	100	426	297	1,530	138	0	2.5	128
29	16	44	34	30	-	317	268	1,540	114	0	1.4	132
30	13	46	34	30	-----	257	250	1,530	82	0	21	142
31	*15	-----	36	*30	-----	240	-----	1,530	-----	0	3.6	-----
Total	1,037.9	1,304	1,352	1,128	1,512	8,640	9,610	3,148.9	2,384.0	1,453.3	2,977.8	1,710.5
Mean	33.5	43.5	43.6	36.4	54.0	279	320	1,016	795	4.69	9.61	57.0
Ac-ft	2,060	2,590	2,680	2,240	3,000	17,140	19,060	62,460	47,290	288	591	3,390

Calendar year 1960: Max 2,790 Min 0 Mean 389 Ac-ft 282,000

Water year 1960-61: Max 1,640 Min 0 Mean 225 Ac-ft 162,800

Peak discharge (base, 3,500 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

Note.--Stage-discharge relation affected by ice Nov. 11 to Mar. 7 (no gage-height record Jan. 3 to Feb. 16).



9-3024. White River below Trapper's Lake, Colo.

Location.--Lat 39°59'50", long 107°13'50", in sec.2, T.1 S., R.88 W., on right bank 200 ft below Trapper's Lake, 1 mile upstream from Skinny Fish Creek, and 21 miles east of Buford.

Drainage area.--21.4 sq mi.

Records available.--October 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 9,600 ft (from topographic map).

Average discharge.--5 years, 28.8 cfs (20,850 acre-ft per year).

Extremes.--Maximum discharge during year, 178 cfs June 13 (gage height, 6.75 ft); minimum daily, 7.4 cfs Nov. 24-26.  
1956-61: Maximum discharge, 481 cfs July 4, 1957 (gage height, 8.03 ft); minimum daily determined, 7.0 cfs Mar. 27, 1960.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

4.6	6.0	6.0	85
4.8	10	6.5	142
5.0	16	7.0	214
5.5	40		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	*10	8.0	9.4	8.8	9.0		10	92	28	16	14
2	11	11	7.8	9.4	9.2	9.4		12	99	26	*15	14
3	10	11	8.4	8.8	9.6	9.4		13	100	23	15	15
4	*11	11	8.6	8.6	9.4	9.0	9.8	14	97	22	14	16
5	11	11	8.6	8.4	9.4	9.6		16	93	21	13	15
6	11	10	8.2	8.4	9.2	10		15	*92	20	12	14
7	11	11	7.8	8.4	9.2	9.4		14	89	19	12	16
8	10	12	8.8	8.4	9.4	9.0	*9.8	14	100	19	12	18
9	10	11	8.0	8.6	9.4	8.6	9.8	14	125	18	12	18
10	11	10	9.4	8.6	9.4	9.0	10	14	152	17	12	18
11	12	9.4	9.6	8.8	9.4	9.2	11	17	164	*17	12	16
12	11	9.4	9.4	9.0	9.2	8.6	9.8	20	175	16	13	15
13	11	9.6	9.4	9.2	9.0	8.8	9.8	24	174	16	13	15
14	11	9.0	9.2	9.2	8.8		11	23	168	15	13	15
15	11	9.6	9.0	9.2	8.6		11	20	148	15	13	14
16	11	9.2	9.0	9.0	9.0		9.8	18	129	15	14	14
17	11	9.2	9.4	9.0	9.0		9.4	18	120	15	15	14
18	11	8.8	11	9.0	8.6		9.4	18	115	14	15	14
19	10	8.6	11	9.0	8.2		9.4	20	106	14	14	*16
20	10	8.4	11	8.8	8.0		12	26	100	15	14	19
21	9.8	8.4	11	8.8	8.4		11	29	*94	16	15	22
22	9.2	8.2	12	8.6	9.0	9.0	9.4	34	85	16	*14	26
23	8.6	7.6	11	8.6	8.8		9.6	*41	76	15	13	24
24	8.4	7.4	10	8.8	9.0		11	47	66	15	13	21
25	8.4	7.4	9.4	9.4	9.6		11	49	57	14	15	18
26	8.2	7.4	9.4	9.8	9.4		11	49	49	14	19	15
27	8.2	8.4	9.6	9.4	9.4		10	55	42	13	17	14
28	8.8	9.0	9.4	8.4	9.4		9.6	61	38	14	15	13
29	9.6	8.6	9.2	8.2	-		9.6	68	34	14	14	15
30	9.8	8.6	9.0	7.8	-----		9.8	89	30	16	14	15
31	9.6	-----	9.0	8.6	-----		-----	86	-----	17	14	-----
Total	314.6	280.2	290.6	273.6	253.8	281.0	302.8	948	3009	529	432	493
Mean	10.1	9.34	9.37	8.83	9.06	9.06	10.1	30.6	100	17.1	13.9	16.4
Ac-ft	624	556	576	543	503	557	601	1,880	5,970	1,050	857	978

Calendar year 1960: Max 193 Min 7.0 Mean 22.5 Ac-ft 16,330  
Water year 1960-61: Max 175 Min 7.4 Mean 20.3 Ac-ft 14,700

\* Discharge measurement made on this day.

Note.--No gage-height record Mar. 13 to Apr. 8, Sept. 2.

## GREEN RIVER BASIN

9-3028. White River near Buford, Colo.

Location--Lat 40°02', long 107°31', in SW<sup>1</sup>/<sub>4</sub> sec. 20, T.1 N., R.90 W., on right bank a third of a mile upstream from highway bridge, three-quarters of a mile downstream from Ute Creek, and 6<sup>1</sup>/<sub>2</sub> miles northeast of Buford.

Drainage area--223 sq mi.

Records available--July 1903 to December 1906, October 1956 to September 1961. Monthly discharge only for some periods, published in WSP 1315. Published as North Fork White River near Buford prior to 1956. Records for May 1910 to December 1915 and July 1919 to December 1920 at site 6<sup>1</sup>/<sub>2</sub> miles downstream not equivalent owing to inflow between the sites.

Gage--Water-stage recorder. Prior to October 1956, staff gage at highway bridge a third of a mile downstream at different datum.

Average discharge--8 years, 315 cfs (228,100 acre-ft per year).

Extremes--Maximum discharge during year, 967 cfs May 11 (gage height, 4.29 ft); maximum gage height, 5.28 ft Jan. 3 (backwater from ice); minimum daily discharge, 100 cfs Jan. 29.  
1903-6, 1956-61: Maximum daily discharge, 1,950 cfs June 8, 1905; minimum daily determined, 100 cfs Jan. 18, 1957, Jan. 18, 19, 1960, Jan. 29, 1961.

Remarks--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of a few hay meadows.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 17-30)

2.8	100	4.0	700
3.0	165	4.5	1,120
3.5	400		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	169	165	154	130	*140	*124	124	350	749	240	177	154
2	165	*162	154	120	140	118	124	380	735	230	177	165
3	165	169	154	110	140	121	148	410	680	230	*177	173
4	165	165	148	110	130	118	154	*420	668	230	173	165
5	*165	162	148	*120	130	118	134	360	635	220	169	169
6	165	162	130	130	140	121	*130	275	*617	220	158	181
7	162	189	120	140	140	121	130	246	642	220	154	169
8	162	177	130	140	154	110	130	241	654	210	154	158
9	173	158	140	140	144	110	120	275	707	210	154	181
10	169	158	150	150	130	115	137	461	778	200	154	169
11	193	165	140	140	127	115	134	648	810	200	151	158
12	177	165	140	140	127	118	130	654	810	*200	154	151
13	173	165	130	140	120	115	140	563	763	197	151	144
14	173	162	130	140	120	121	137	416	714	193	148	140
15	169	162	120	140	127	127	134	385	642	185	144	140
16	169	169	120	130	124	127	137	375	587	177	151	148
17	169	165	140	130	120	127	151	355	557	173	158	151
18	169	165	170	130	120	124	*170	390	533	165	144	173
19	165	158	160	120	110	121	200	473	497	162	137	*185
20	165	158	148	120	120	124	220	563	461	177	134	185
21	162	169	144	120	127	120	190	581	433	177	144	210
22	162	154	140	130	120	110	180	629	*400	162	*137	241
23	158	154	137	130	127	124	200	*629	360	154	130	228
24	158	154	130	140	110	137	190	611	330	158	134	214
25	158	154	130	140	120	137	170	605	310	158	173	214
26	158	154	130	140	124	127	160	635	300	154	201	228
27	158	154	137	130	110	120	170	654	280	154	154	236
28	162	150	130	110	124	124	200	654	270	154	144	255
29	158	*130	120	100	-	121	250	668	260	158	140	310
30	158	150	120	130	-----	110	300	749	250	169	151	255
31	165	-----	120	140	-----	120	-----	735	-----	173	162	-----
Total	5,139	4,824	4,264	4,030	3,565	3,745	4,894	15,390	16,432	5,810	4,789	5,650
Mean	166	161	138	130	127	121	163	496	548	187	154	188
Ac-ft	10,190	9,570	8,460	7,990	7,070	7,430	9,710	30,530	32,590	11,520	9,500	11,210

Calendar year 1960: Max 958 Min 100 Mean 250 Ac-ft 181,800  
Water year 1960-61: Max 810 Min 100 Mean 215 Ac-ft 155,800

Peak discharge (base, 1,000 cfs)--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 30, Dec. 6-19, 24-26, Dec. 28 to Feb. 7, Feb. 13, 14, 17-20, 22, 24, 25, 27, Mar. 8, 9, 21, 22, 27, 30, 31. No gage-height record Nov. 28, 29, Jan. 3, 7, 8, 16-20, 27-29, Feb. 1, Apr. 8, 9, Apr. 18 to May 4, June 22 to July 12.

## 9-3030. White River at Buford, Colo.

Location.--Lat 39°59', long 107°37', in NW¼ sec.9, T.1 S., R.91 W., on right bank 600 ft east of Buford and 1¼ miles upstream from South Fork White River.

Drainage area.--254 sq mi.

Records available.--May 1910 to December 1915, July 1919 to December 1920, October 1951 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as North Fork White River near Buford prior to 1951. Records for July 1903 to December 1906 at site 6½ miles upstream not equivalent owing to inflow between sites.

Gage.--Water-stage recorder. Altitude of gage is 7,010 ft (from topographic map). May 24, 1910, to May 27, 1914, staff gage at site 1½ miles upstream at different datum. May 28, 1914, to Dec. 7, 1915, and July 1, 1919, to Oct. 9, 1920, staff gage at present site at different datum.

Average discharge.--16 years, 319 cfs (230,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,030 cfs May 11 (gage height, 5.60 ft); maximum gage height, 7.22 ft Jan. 9 (backwater from ice); minimum daily discharge, 110 cfs Jan. 29.  
1910-15, 1919-20, 1951-61: Maximum daily discharge, 3,150 cfs May 30, 1912; maximum gage height, that of Jan. 9, 1961; minimum daily discharge, 90 cfs Feb. 21, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 900 acres above and 300 acres below station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	172	172	160	140	150	*140	162	480	754	268	199	202
2	172	*170	160	130	*150	146	162	475	747	256	193	212
3	170	172	158	120	150	150	187	485	698	252	*181	222
4	170	170	155	120	150	146	222	*465	668	248	187	208
5	*172	168	155	*130	140	146	184	420	638	236	160	212
6	170	168	140	140	140	148	*172	312	*620	236	162	226
7	170	199	130	150	150	152	170	272	638	233	158	202
8	168	193	130	150	160	140	162	256	656	233	160	187
9	175	165	140	150	150	140	155	304	710	226	175	212
10	181	165	152	160	140	140	158	525	768	222	178	187
11	208	178	150	150	140	146	152	722	796	216	178	172
12	196	178	140	150	140	148	150	740	810	*219	181	165
13	184	170	140	150	130	148	160	620	768	212	172	162
14	190	168	140	150	130	152	150	455	722	212	170	160
15	181	168	130	150	130	162	148	430	650	202	181	160
16	181	172	120	140	130	168	145	410	592	196	172	162
17	184	170	140	140	130	165	150	380	565	196	181	170
18	181	168	170	140	130	162	184	425	545	196	170	202
19	178	162	170	130	120	158	*240	530	510	196	160	*219
20	178	152	160	130	120	158	268	638	480	212	158	212
21	175	181	150	130	130	158	212	656	450	219	168	260
22	175	175	150	140	130	150	205	710	*415	208	*158	304
23	172	170	140	140	130	165	222	*692	385	193	148	276
24	170	155	140	150	120	184	202	680	356	193	152	256
25	168	155	130	150	130	181	184	680	338	202	208	256
26	165	155	140	150	130	175	170	698	316	193	236	280
27	168	158	140	140	120	184	178	710	304	193	184	304
28	168	150	140	120	130	165	212	704	292	190	178	334
29	165	*140	130	110	-	158	288	686	280	190	175	410
30	162	150	130	140	-----	152	410	775	276	190	193	280
31	172	-----	130	150	-----	158	-----	768	-----	193	216	-----
Total	5,441	5,017	4,460	4,340	3,800	4,845	5,764	17,103	16,747	6,631	5,492	6,814
Mean	176	167	144	140	136	156	192	552	558	214	177	227
Ac-ft	10,790	9,950	8,850	8,610	7,540	9,610	11,430	33,920	33,220	13,150	10,890	13,520

Calendar year 1960: Max 922 Min 120 Mean 272 Ac-ft 197,700  
Water year 1960-61: Max 810 Min 110 Mean 237 Ac-ft 171,500

Peak discharge (base, 1,000 cfs).--May 11 (9 p.m.) 1,030 cfs (5.60 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 28 to Dec. 2, Dec. 6-9, Dec. 12 to Jan. 8, Mar. 8-10. No gage-height record Jan. 9 to Mar. 1 (stage-discharge relation affected by ice during most of period).

## GREEN RIVER BASIN

9-3040. South Fork White River at Buford, Colo.

Location.--Lat 39°58', long 107°38', in NW $\frac{1}{4}$  sec.17, T.1 S., R.91 W., on left bank 300 ft downstream from highway bridge, three-quarters of a mile upstream from mouth, and 1 mile south of Buford.

Drainage area.--170 sq mi, approximately.

Records available.--July 1919 to December 1920, October 1951 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 6,970 ft (from topographic map). Prior to Nov. 30, 1920, staff gage at site 300 ft upstream at different datum.

Average discharge.--11 years, 259 cfs (187,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,390 cfs June 1 (gage height, 5.44 ft); maximum gage height, 5.89 ft Dec. 30 (backwater from ice); minimum daily discharge, 75 cfs Feb. 1, 2.

1919-20, 1951-61: Maximum discharge, about 3,000 cfs June 30, 1957; maximum gage height, 7.07 ft June 30, 1957; minimum daily discharge determined, 60 cfs Feb. 21, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation of about 1,100 acres above station and a few acres below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 16 to Aug. 5)

2.8	80	4.0	355
3.0	96	4.5	620
3.3	137	5.0	1,020
3.6	205	5.3	1,300

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	110	122	110	95	75	*100	113	168	1,300	195	150	134
2	112	*116	110	95	*75	99	112	205	1,250	185	160	130
3	110	116	110	90	90	99	119	223	1,080	182	*150	136
4	110	116	110	90	100	98	134	*247	876	178	145	131
5	*108	114	100	*95	95	98	128	232	816	178	145	131
6	112	112	85	95	90	98	*124	198	*840	173	134	141
7	116	122	85	100	90	96	125	185	858	171	132	137
8	116	122	90	100	90	96	120	173	1,010	164	131	131
9	119	100	95	100	95	96	116	173	1,130	157	134	137
10	122	95	100	100	95	102	118	208	1,210	155	131	137
11	131	100	100	100	95	99	114	319	1,130	155	130	130
12	130	110	95	100	95	98	113	405	1,160	*153	130	125
13	125	118	90	100	95	98	114	425	1,020	149	130	126
14	126	114	85	100	90	102	114	335	921	147	124	131
15	124	113	85	100	95	104	106	295	746	143	120	128
16	124	100	85	95	100	104	113	303	634	139	122	128
17	124	100	90	95	100	105	112	295	566	137	125	128
18	124	100	95	95	95	105	124	335	500	136	120	134
19	120	110	100	95	80	104	*132	495	450	134	113	*147
20	120	95	110	95	95	105	151	662	400	134	110	147
21	119	100	100	95	100	102	136	662	364	136	112	155
22	118	100	95	100	100	104	130	816	*331	136	*107	182
23	118	100	95	100	100	108	132	*885	303	134	106	171
24	118	100	95	100	100	120	132	930	279	132	105	164
25	116	100	100	110	100	122	128	903	263	130	125	159
26	118	100	100	100	95	114	122	921	239	130	134	164
27	116	100	100	95	90	110	122	1,070	226	130	122	168
28	116	95	95	90	95	112	124	1,140	217	130	116	175
29	116	*90	90	85	-	107	132	1,110	205	135	116	200
30	100	110	85	85	-----	107	151	1,240	198	140	125	198
31	110	-----	90	90	-----	110	-----	1,250	-----	150	132	-----
Total	3,648	3,190	2,975	2,985	2,615	3,222	3,711	1,680	2,052	4,648	3,936	4,405
Mean	118	106	96.0	96.3	93.4	104	124	542	684	150	127	147
Ac-ft	7,240	6,330	5,900	5,920	5,190	6,390	7,360	33,340	40,700	9,220	7,810	8,740

Calendar year 1960: Max 1,680 Min 80 Mean 232 Ac-ft 168,400

Water year 1960-61: Max 1,300 Min 75 Mean 199 Ac-ft 144,100

Peak discharge (base, 1,300 cfs).--June 1 (5:30 a.m.) 1,390 cfs (5.44 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 29-31, Nov. 9-12, Nov. 16 to Mar. 1. No gage-height record Dec. 28 to Jan. 4, Jan. 16-24, 27-29, 31, Feb. 1, July 25 to Aug. 3.



9-3041. Big Beaver Creek near Buford, Colo.

Location.--Lat 39°58', long 107°39', in NW¼ sec.18, T.1 S., R.91 W., on right bank 165 ft upstream from bridge on County Highway 132, 300 ft upstream from mouth, and 2 miles southwest of Buford.

Drainage area.--34.6 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Prior to Sept. 7, 1957, at site 35 ft upstream at same datum.

Average discharge.--6 years, 16.0 cfs (11,580 acre-ft per year).

Extremes.--Maximum discharge during year, 117 cfs May 25 (gage height, 2.81 ft); no flow Aug. 10-12, 14, 15, 18-21.  
1955-61: Maximum discharge, 395 cfs June 3, 1957 (gage height, 4.46 ft); no flow at times in 1956, 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Small diversions above station for irrigation of hay meadows. One diversion above station for irrigation below station along the White River.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 11-20, 23-28, Apr. 1-24)

1.1	0	1.7	6.0
1.3	.2	1.9	14
1.4	.8	2.2	35
1.5	1.6	2.5	66
1.6	3.5	3.0	135

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0.6		2.4		*3.0	6.0	39	30	0.2	0.1	0.2
2	.8	*.6		2.4	(*)	3.0	6.0	50	25	.2	.1	.2
3	.7	1.2		2.4	2.2	3.0	8.4	55	21	.2	*.1	.2
4	.7	1.4		2.4		3.0	13	*50	17	.2	.1	.2
5	*.7	1.4		*2.2		3.0	*10	43	15	.2	.1	.2
6	.7	1.4		2.0		2.8	8.8	33	*13	.5	.1	.2
7	.7	1.5		2.0		2.6	8.4	29	12	1.4	.1	.3
8	.7	1.6	2.5	1.8		2.4	7.0	26	8.4	.8	.1	.5
9	.7	2.0		1.8		2.6	6.7	29	.6	.1	.1	.6
10	.8	2.4		2.0	2.6	2.8	6.4	51	1.2	.1	0	.6
11	1.0	2.6		2.0		3.1	5.8	85	1.4	.1	0	.6
12	1.0	2.7		2.0		3.1	6.7	92	1.5	*.1	0	.5
13	1.0	2.9		2.0		3.1	8.1	80	1.4	.1	.1	.4
14	1.0	2.7		1.8		3.3	7.4	55	1.4	.1	0	.3
15	1.0	2.6		2.2		5.0	7.4	51	1.4	.1	0	.4
16	.9	2.6		2.0		6.0	7.0	51	1.4	.1	.1	.3
17	.8	2.8		1.8	3.0	5.8	7.8	46	1.3	.1	.1	.4
18	.7	2.8		2.0		6.4	*10	54	1.2	.1	0	.6
19	.7	2.9		2.0		6.7	13	71	1.1	.1	0	*.7
20	.6	2.8		2.0		7.0	16	79	1.0	.1	0	.8
21	.6	2.8	2.8			6.2	13	76	.8	.1	0	2.5
22	.6	2.7				5.4	12	90	*.6	.1	*.1	10
23	.7	2.6			3.6	7.4	15	*90	.5	.1	.1	9.5
24	.6	2.6				13	15	80	.3	.1	.1	8.4
25	.6	2.4				12	12	83	.3	.1	.1	7.4
26	.6	2.2	2.9	2.0	3.8	7.4	11	88	.2	.1	.1	8.4
27	.5	2.2	2.9		4.0	5.8	10	82	.2	.1	.1	13
28	.5	2.2	2.6		4.0	5.2	12	74	.2	.1	.1	13
29	.6	*2.2	2.6		-	4.8	18	65	.2	.1	.1	20
30	.7	2.5	2.6		-----	5.0	29	64	.2	.1	.1	16
31	.6	-----	2.2		-----	5.4	-----	46	-----	.1	.2	-----
Total	22.6	65.9	81.3	63.2	81.8	155.3	316.9	1907	159.8	6.0	2.3	116.4
Mean	0.73	2.20	2.62	2.04	2.92	5.01	10.6	61.5	5.33	0.19	0.07	3.88
Ac-ft	45	131	161	125	162	308	629	3,780	317	12	4.6	231

Calendar year 1960: Max 141 Min 0.1 Mean 12.7 Ac-ft 9,220

Water year 1960-61: Max 92 Min 0 Mean 8.16 Ac-ft 5,910

Peak discharge (base, 200 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 9-11, 15-18, 20, 21, Nov. 25 to Dec. 25, Mar. 2-10, 21, 22, 29-31. No gage-height record Jan. 21 to Mar. 1 (stage-discharge relation affected by ice most of period).

## GREEN RIVER BASIN

9-3043. Coal Creek near Meeker, Colo.

Location.--Lat 40°05'30", long 107°46'05", in NE $\frac{1}{4}$  sec. 1, T.1 N., R.9 $\frac{3}{4}$  W., on right bank 200 ft downstream from unnamed tributary, 300 ft above headgate of ditch, 1.3 miles below Ninemile Draw, and 8 miles northeast of Meeker.

Drainage area.--25 sq mi, approximately.

Records available.--October 1957 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,820 ft (from topographic map).

Extremes.--Maximum discharge during year, 37 cfs May 11 (gage height, 3.58 ft); minimum daily, 0.4 cfs Aug. 24.  
1957-61: Maximum discharge, 102 cfs May 11, 1958 (gage height, 4.37 ft); minimum daily, 0.4 cfs Sept. 9, 10, Nov. 20-23, 1959, Aug. 24, 1961.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Slight regulation by two small storage reservoirs above station. Diversions for irrigation of a few acres of hay meadows above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	0.4	2.8	9.3
2.3	.8	3.2	20
2.4	1.6	3.5	31
2.5	3.0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	*1.7			(*)	(*)	2.0	8.4	2.8	2.4	1.1	0.6
2	1.5	1.6					3.0	11	23	1.9	*1.0	1.1
3	1.5	1.6					4.0	*12	20	1.9	1.1	1.6
4	*1.5	1.6		(*)			3.6	12	19	.9	1.0	1.4
5	1.5	1.7					*3.2	12	18	1.0	.8	1.2
6	1.6	1.9					2.9	10	18	.9	.7	1.0
7	1.6	2.4					2.6	10	*17	.9	1.3	.9
8	1.7	2.3					2.9	9.3	16	.8	1.9	1.0
9	2.0	2.0					2.4	9.8	14	.8	2.0	1.4
10	2.0	2.0					2.6	14	13	.8	2.0	1.2
11	3.2	2.0					2.6	21	12	*.8	2.0	1.0
12	2.3	1.9					2.9	25	11	.7	2.3	1.0
13	2.0	1.9					3.6	22	8.9	.7	2.2	1.0
14	2.2	1.9					2.9	19	7.8	.6	1.9	1.0
15	2.2	2.0					b 2.6	19	5.4	.6	1.9	1.1
16	2.2	2.3	1.8	1.4	1.0	1.2	2.7	19	4.2	.6	2.2	1.4
17	2.2	2.6					4.4	17	4.8	.6	2.2	1.5
18	2.2	2.6					*5.0	19	5.2	.6	1.4	*1.9
19	2.0	2.2					7.5	22	5.0	.6	1.2	1.6
20	2.0	b 2.2					8.0	24	4.4	.6	1.1	1.5
21	2.0	b 2.2					6.3	23	*3.8	1.0	1.2	2.6
22	2.0	b 2.2					5.6	23	2.7	.9	1.1	4.0
23	2.0	b 2.2					6.0	24	2.4	1.0	*.6	3.6
24	1.9	b 2.0					5.6	*22	2.3	1.0	.4	3.4
25	1.9	b 2.0					5.4	21	2.2	1.0	.7	3.4
26	1.9	b 2.0					5.0	22	3.2	1.1	.8	4.2
27	1.9	b 2.0					4.4	21	2.9	1.0	.7	4.0
28	1.9	1.8					4.6	20	2.9	.8	.6	3.8
29	1.9	*2.0					6.0	17	2.4	.7	.6	5.6
30	2.2	1.8					7.5	16	2.4	.9	.8	5.0
31	2.2	-----			-----		-----	21	-----	1.6	.9	-----
Total	60.7	60.6	55.8	43.4	28.0	37.2	127.8	545.5	281.9	29.7	39.7	64.2
Mean	1.96	2.02	1.8	1.4	1.0	1.2	4.26	17.6	9.40	0.96	1.28	2.14
Ac-ft	120	120	111	86	56	74	253	1,080	559	59	79	127

Calendar year 1960: Max 32

Min 0.6

Mean 5.09

Ac-ft 3,700

Water year 1960-61: Max 28

Min 0.4

Mean 3.77

Ac-ft 2,720

Peak discharge (base, 50 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 28 to Apr. 5 (stage-discharge relation affected by ice during most of period).

9-3045. White River near Meeker, Colo.

Location---Lat 40°02'00", long 107°51'35", in NE $\frac{1}{4}$  sec.30, T.1 N., R.93 W., on left bank 1 mile upstream from Curtis Creek and 2 $\frac{1}{2}$  miles east of Meeker.

Drainage area---762 sq mi.

Records available---June 1901 to December 1906, October 1909 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "at Meeker" 1901-13.

Gage---Water-stage recorder. Altitude of gage is 6,320 ft (from topographic map). Prior to Oct. 31, 1906, and May 7 to Aug. 13, 1910, staff gage and Aug. 14, 1910, to Oct. 19, 1913, water-stage recorder, at site 2 $\frac{1}{2}$  miles downstream at different datum. Oct. 20, 1913, to Sept. 30, 1933, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge---57 years, 630 cfs (456,100 acre-ft per year).

Extremes---Maximum discharge during year, 2,100 cfs June 1 (gage height, 2.87 ft); minimum daily, 170 cfs Aug. 15. 1901-6, 1909-61: Maximum discharge observed, 6,370 cfs June 16, 1921 (gage height, 5.60 ft, present datum), from rating curve extended above 4,700 cfs; minimum daily, 112 cfs July 17, 1934.

Remarks---Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 12,000 acres above station and about 3,000 acres below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Aug. 1 to Sept. 30)

-0.1	165	2.0	1,090
0.3	230	2.5	1,550
1.0	510	3.0	2,200
1.5	750		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	315	371	327	290	280	*284	331	605	1,950	388	311	311
2	327	*363	319	270	250	295	350	740	1,900	355	303	339
3	327	363	339	250	250	295	360	816	1,700	355	*288	367
4	327	359	339	*240	250	284	370	*810	1,460	351	230	343
5	*327	351	327	250	240	284	*340	786	1,380	359	245	347
6	319	343	300	270	230	284	*343	650	*1,320	351	222	380
7	323	384	270	300	240	b270	351	591	1,310	351	222	363
8	323	402	290	310	250	b260	331	555	1,410	331	198	343
9	335	347	340	310	240	b260	319	560	1,510	311	200	388
10	351	315	330	310	240	299	331	730	1,680	319	206	380
11	388	343	320	310	250	292	331	1,110	1,620	323	200	331
12	388	363	310	300	260	292	327	1,280	1,680	*327	198	307
13	367	359	b300	300	260	292	351	1,240	1,510	319	204	295
14	371	351	b290	300	250	311	335	912	1,410	303	188	303
15	371	351	b280	300	*250	339	303	834	1,210	295	170	295
16	371	323	270	280	b250	347	315	810	1,040	284	184	307
17	380	327	280	260	b250	339	315	780	961	274	212	335
18	380	327	320	260	b240	335	355	798	891	260	233	*339
19	371	355	310	260	b230	327	*406	1,020	798	248	224	388
20	367	303	300	250	b240	319	496	1,290	730	274	226	384
21	367	327	290	240	b240	319	447	1,290	685	347	267	460
22	363	347	310	250	b240	299	398	1,430	*615	359	*295	635
23	363	323	300	250	b240	323	420	*1,530	564	347	239	582
24	359	335	290	250	b220	363	406	1,560	528	295	214	560
25	351	335	280	260	b240	388	388	1,510	506	281	278	537
26	343	335	280	260	b250	347	359	1,560	483	274	363	550
27	351	335	310	230	257	327	355	1,660	452	260	284	550
28	351	315	280	190	303	319	371	1,790	429	257	254	550
29	355	*260	260	200	-	303	438	1,650	398	260	248	645
30	343	355	260	250	-----	295	542	1,910	402	260	267	615
31	343	-----	270	*310	-----	311	-----	1,920	-----	278	307	-----
Total	1 0917	1 0267	9 291	8 310	6 940	9 602	1 1084	3 4727	3 2532	9 596	7 480	1 2529
Mean	352	342	300	268	248	310	369	1,120	1,084	310	241	418
Ac-ft	21,650	20,360	18,430	16,480	13,770	19,050	21,980	68,880	64,530	19,030	14,840	24,850

Calendar year 1960: Max 2,420 Min 220 Mean 527 Ac-ft 382,300  
Water year 1960-61: Max 1,950 Min 170 Mean 447 Ac-ft 323,800

Peak discharge (base, 2,100 cfs)---June 1 (6:30 a.m.) 2,100 cfs (2.87 ft).

\* Discharge measurement made on this day.

† Stage-discharge relation affected by ice.

Note---No gage-height record Dec. 6-12, Dec. 16 to Feb. 15, Apr. 2-5 (stage-discharge relation affected by ice during most of periods).

## GREEN RIVER BASIN

9-3065. White River near Watson, Utah

Location---Lat 39°59', long 109°11', in sec.2, T.10 S., R.24 E., Salt Lake meridian, on right bank 350 ft downstream from bridge on State Highway 45, 1 mile downstream from Evacuation Creek, and 7 miles north of Watson.

Drainage area---4,020 sq mi, approximately.

Records available---April 1904 to October 1906 (no winter records), May to November 1918, April 1923 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "near Dragon" 1906 and as "near Rangely, Colo." 1904-5, 1918.

Gage---Water-stage recorder. Datum of gage is 4,946.78 ft above mean sea level, datum of 1929. Apr. 15, 1904, to Oct. 31, 1905, and May 19 to Nov. 23, 1918, staff gage at site 25 miles upstream (half a mile northwest of Rangely, Colo.) at different datum. Apr. 1 to Oct. 31, 1906, staff or chain gages at site 350 ft upstream at different datum. Apr. 1, 1923, to Oct. 3, 1938, water-stage recorder at site 350 ft upstream at datum 4.48 ft higher; Oct. 4, 1938, to Apr. 17, 1939, at site 1,450 ft upstream at different datum; Apr. 18, 1939, to Sept. 6, 1956, at site 100 ft upstream at datum 3.00 ft higher; Sept. 7, 1956, to Oct. 26, 1959, at site 250 ft upstream at datum 3.00 ft higher.

Average discharge---38 years (1923-61), 715 cfs (517,600 acre-ft per year).

Extremes---Maximum discharge during year, 4,180 cfs Sept. 22 (gage height, 6.86 ft); minimum daily, 160 cfs Dec. 7. 1904-6, 1918, 1923-61: Maximum daily discharge, 8,160 cfs July 15, 1929; minimum, 52 cfs July 19, 20, 1934; minimum daily, 53 cfs July 19, 1934.

Remarks---Records good except those for period of ice effect, which are poor. Diversions for irrigation of about 30,000 acres above station.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	140	4.0	1,100
3.0	300	5.0	2,100
3.5	630	5.4	2,500

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	325	335	300	280	320	380	330	417	1,840	320	*295	300
2	325	345	392	280	310	420	345	*501	1,840	315	390	320
3	320	356	398	*280	300	380	350	630	1,810	305	350	340
4	325	356	362	270	280	368	*340	755	1,620	305	454	404
5	320	356	380	260	280	356	345	800	*1,440	300	340	386
6	*310	356	350	290	300	330	380	820	1,360	290	285	374
7	310	356	160	320	300	335	356	694	1,300	285	260	368
8	315	368	180	330	320	315	362	598	1,280	295	238	374
9	335	417	210	330	340	325	368	550	1,360	300	230	791
10	330	398	330	330	350	310	380	494	1,430	*285	222	622
11	345	356	360	330	350	340	392	543	1,590	270	210	445
12	350	340	340	330	350	362	392	960	1,580	250	310	380
13	380	362	330	330	350	368	380	1,250	1,610	242	415	362
14	386	380	*320	320	350	392	374	1,350	1,520	255	260	345
15	368	380	320	320	350	431	380	1,090	1,380	250	230	345
16	374	374	300	310	*360	522	345	890	1,230	246	222	350
17	374	356	280	310	380	543	*330	810	1,050	238	210	368
18	368	345	300	320	390	494	330	791	920	222	214	494
19	368	356	340	330	380	392	330	773	840	222	226	550
20	362	362	330	*330	380	362	356	910	*755	214	242	1,300
21	356	362	320	320	380	340	410	1,270	678	206	*255	501
22	356	330	310	320	380	335	459	*1,370	622	242	246	2,490
23	305	356	320	310	370	320	404	1,450	558	285	250	1,490
24	356	362	320	290	370	315	386	1,540	515	280	250	1,110
25	356	350	320	290	360	335	398	1,540	487	265	413	870
26	350	356	300	300	380	392	392	1,530	459	226	562	737
27	340	362	290	300	*380	386	368	1,540	424	234	335	670
28	345	*356	280	270	370	362	350	1,620	392	222	330	662
29	345	335	200	250	-	345	345	1,720	386	222	325	662
30	350	330	280	250	-----	330	356	1,640	335	214	424	728
31	*350	-----	280	280	-----	320	-----	1,770	-----	242	310	-----
Total	10,699	10,753	9,502	9,380	9,730	11,505	11,033	32,616	32,611	8,047	9,303	19,138
Mean	345	358	307	303	348	371	368	1,052	1,087	260	300	638
Ac-ft	21,220	21,330	18,850	18,600	19,300	22,820	21,880	64,690	64,680	15,960	18,450	37,960

Calendar year 1960: Max 2,330 Min 160 Mean 539 Ac-ft 391,200

Water year 1960-61: Max 2,490 Min 160 Mean 478 Ac-ft 345,700

Peak discharge (base, 2,900 cfs)---Sept. 22 (9:30 a.m.) 4,180 cfs (6.86 ft).

\* Discharge measurement made on this day.

Note---Stage-discharge relation affected by ice Dec. 7 to Mar. 3.



9-3399. East Fork San Juan River above Sand Creek, near Pagosa Springs, Colo.

Location.--Lat 37°23'25", long 106°50'25", in NE $\frac{1}{4}$  sec.4, T.36 N., R.1 E., on right bank 0.3 mile upstream from Sand Creek, 4 miles upstream from West Fork San Juan River, and 13 miles northeast of Pagosa Springs.

Drainage area.--64.1 sq mi.

Records available.--October 1956 to September 1961. Prior to October 1959, published as San Juan River above Sand Creek, near Pagosa Springs.

Gage.--Water-stage recorder. Altitude of gage is 8,900 ft (from topographic map).

Average discharge.--5 years, 89.2 cfs (64,580 acre-ft per year).

Extremes.--Maximum discharge during year, 448 cfs May 22 (gage height, 4.65 ft); minimum daily, 4 cfs Dec. 16.

1956-61: Maximum discharge, 1,210 cfs June 6, 1957 (gage height, 6.32 ft); minimum daily determined, 3.4 cfs Dec. 26, 1958. Maximum flood known Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. No diversions above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	9	3.6	116
2.8	18	4.0	210
3.0	33	4.5	390
3.3	68		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	9.8	7	5.5	}	}	17	261	342	62	19	28
2	13	*9.4	7	5.5			20	286	*310	71	*25	24
3	12	9.4	7.5	5			40	*296	268	67	84	39
4	12	9.4	7	5.5			*50	258	240	58	64	34
5	12	9.4	6.5	5.5			64	200	234	50	53	34
6	12	9.8	5.5	7	}	}	49	158	228	48	44	*34
7	12	14	7	5.5			49	134	216	47	40	29
8	11	12	7	6			41	116	216	47	36	31
9	13	11	7	6			32	123	228	43	32	77
10	14	9	6.5	6			37	160	234	*40	29	58
11	14	9	6.5	6	}	}	36	222	219	36	31	45
12	*13	9	7	6			45	275	205	31	43	40
13	12	9	7	6			51	244	190	29	39	37
14	12	9	6	6			42	188	*175	30	35	34
15	12	9	5	6			36	162	172	27	33	32
16	14	7	4	}	}	}	51	168	156	29	47	34
17	16	7	5				82	200	145	27	56	33
18	16	7	5.5				118	261	142	25	51	108
19	14	7	6				136	322	131	25	44	103
20	14	7	6				156	334	123	30	39	95
21	14	7	6	}	}	}	156	303	118	31	35	81
22	15	7	6.5				158	354	111	24	34	78
23	14	6.5	6.5				178	*366	103	22	38	76
24	14	6.5	6				153	322	95	21	40	68
25	14	7	6				114	334	85	22	48	62
26	14	7	5.5	}	}	}	107	350	79	22	47	55
27	13	7	5.5				111	362	75	22	37	51
28	14	6.5	6				142	362	74	22	34	48
29	13	5	5.5				185	362	68	22	32	45
30	10	6.5	5				225	362	63	20	33	41
31	9	-----	5.5	-----	-----	-----	-----	358	-----	19	31	-----
Total	405	249.2	190.0	200.5	202.5	430	2,681	8,203	5,045	1,069	1,253	1,554
Mean	13.1	8.31	6.13	6.47	7.2	13.9	89.4	265	168	34.5	40.4	51.8
Ac-ft	803	494	377	398	402	853	5,320	16,270	10,010	2,120	2,490	3,080

Calendar year 1960: Max 552 Min 4 Mean 91.2 Ac-ft 66,190  
Water year 1960-61: Max 366 Min 4 Mean 58.9 Ac-ft 42,620

Peak discharge (base, 500 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 10 to Jan. 14, Apr. 9, 15. No gage-height record Jan. 15 to Apr. 4 (stage-discharge relation affected by ice during most of period).

SAN JUAN RIVER BASIN

9-3400. East Fork San Juan River near Pagosa Springs, Colo.

Location.--Lat 37°22'00", long 106°53'40", in SE<sup>1</sup> sec.12, T.36 N., R.1 W., on right bank a quarter of a mile upstream from private highway bridge, half a mile upstream from West Fork, and 9.5 miles northeast of Pagosa Springs.

Drainage area.--86.9 sq mi.

Records available.--May 1935 to September 1961. Prior to October 1959, published as San Juan River near Pagosa Springs.

Gage.--Water-stage recorder. Datum of gage is 7,597.63 ft above mean sea level, datum of 1929. Prior to Sept. 8, 1938, at site a quarter of a mile downstream at different datum.

Average discharge.--26 years, 120 cfs (86,880 acre-ft per year).

Extremes.--Maximum discharge during year, 610 cfs May 22 (gage height, 3.30 ft); maximum gage-height, 3.70 ft Mar. 15 (ice jam); minimum daily discharge, 8 cfs many days.

1935-61: Maximum discharge, 2,070 cfs May 12, 1941 (gage height, 4.84 ft), from rating curve extended above 1,300 cfs; minimum daily, 5.5 cfs Dec. 20, 1939.

Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of a few hundred acres of hay meadows below station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 20 to June 3)

1.2	13	2.1	145
1.3	18	2.5	280
1.5	35	3.5	770
1.8	76		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	14	13	9	8	8	20	356	440	78	23	31
2	17	*14	13	8.5	8.5	9	24	*388	396	88	*32	27
3	16	14	13	8	9	10	50	383	334	86	107	46
4	16	14	13	8.5	8	10	*92	342	300	74	73	46
5	16	15	*11	9	8	10	105	260	296	66	57	41
6	16	15	9.5	9.5	8.5	10	70	199	*304	62	47	*41
7	15	25	12	10	8	9.5	70	162	296	62	43	34
8	14	23	12	10	8.5	*9.5	59	140	300	65	39	34
9	17	20	12	9.5	8.5	10	44	157	320	59	34	101
10	20	16	11	10	9	11	48	216	329	*54	31	73
11	21	16	10	10	9	13	45	312	308	51	35	54
12	*19	15	11	9.5	9	14	56	383	292	45	54	47
13	17	16	10	9	9	16	71	329	272	43	46	41
14	17	16	11	9	9.5	18	54	244	256	43	41	39
15	17	16	11	9.5	9	19	46	216	*248	40	40	45
16	20	14	9	*9.5	*8.5	19	66	222	216	37	65	51
17	25	14	9.5	9.5	9	19	116	280	202	40	76	41
18	27	14	9	9.5	8.5	19	168	360	193	36	65	178
19	25	14	9.5	10	8	20	180	450	180	33	54	157
20	25	14	9	9	8.5	19	202	450	168	39	45	145
21	26	15	9	9	8	19	212	410	157	41	40	116
22	24	15	9	9.5	8.5	22	216	470	145	35	36	107
23	24	14	9	9.5	9	40	230	465	137	30	41	98
24	23	14	9.5	10	8	48	196	420	123	28	43	88
25	22	14	10	10	8.5	34	142	430	111	27	50	74
26	22	14	9.5	9.5	9	27	129	445	103	28	54	68
27	22	15	9.5	10	9	22	134	460	96	29	41	62
28	22	15	10	10	8.5	22	183	460	92	28	37	57
29	21	12	10	9	-	22	240	475	88	28	35	54
30	16	13	10	8	-----	19	300	465	82	24	36	48
31	15	-----	9	8	-----	13	-----	460	-----	24	35	-----
Total	613	460	323.0	289.0	240.5	561.0	3568	10809	6784	1423	1455	2044
Mean	19.8	15.3	10.4	9.32	8.59	18.1	119	349	226	45.9	46.9	66.1
Ac-ft	1,220	912	641	573	477	1,110	7,080	21,440	13,460	2,820	2,890	4,050

Calendar year 1960: Max 742 Min 9 Mean 127 Ac-ft 91,940  
Water year 1960-61: Max 475 Min 8 Mean 78.3 Ac-ft 56,670

Peak discharge (base, 600 cfs).--May 22 (8:30 p.m.) 610 cfs (3.30 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 30, 31, Nov. 10-13, Nov. 16 to Mar. 18, Mar. 22, 23, 27, 31, Apr. 2, 9, 15 (no gage-height record Jan. 11 to Feb. 15).

9-3425. San Juan River at Pagosa Springs, Colo.

Location.--Lat 37°15'50", long 107°00'40", in S $\frac{1}{2}$  sec.13, T.35 N., R.2 W., on right bank at former bridge site in Pagosa Springs, 0.2 mile upstream from McCabe Creek, 0.6 mile downstream from bridge on U. S. Highway 160, and 2 miles upstream from Mill Creek.

Drainage area.--298 sq mi.

Records available.--October 1910 to December 1914, May 1935 to September 1961. Monthly discharge only for some periods, published in WSP 1513.

Gage.--Water-stage recorder. Datum of gage is 7,052.04 ft above mean sea level, datum of 1929. Jan. 29 to Mar. 6, 1911, staff gage at site half a mile upstream at different datum. Mar. 7 to Oct. 4, 1911, staff gage at present site at different datum. Nov. 23, 1911, to Nov. 14, 1914, staff gage at site 300 ft downstream at different datum.

Average discharge.--30 years, 380 cfs (275,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,870 cfs May 22 (gage height, 4.79 ft); minimum daily, 24 cfs Dec. 6.

1910-14, 1935-61: Maximum discharge, about 25,000 cfs Oct. 5, 1911 (gage height, 17.8 ft, from floodmarks), from velocity-area study; minimum daily, 9.7 cfs Oct. 5, 6, 1956.

Maximum stage known, that of Oct. 5, 1911. Flood of June 29, 1927, reached a stage of 13.5 ft (discharge, about 16,000 cfs), from information by local residents.

Remarks.--Records fair. Diversions for irrigation of several thousand acres above station.

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	47	42	38	34	29	172	1,010	1,440	191	58	91
2	33	*46	43	39	34	36	180	*1,120	1,280	194	64	75
3	34	47	49	39	38	43	223	1,080	1,090	191	*210	110
4	34	46	43	39	38	36	277	940	948	180	*174	125
5	35	44	*38	39	34	35	288	692	916	160	177	118
6	33	47	24	39	31	33	*217	530	*868	145	116	*129
7	31	64	42	39	31	30	260	465	846	162	95	98
8	40	63	46	38	33	*36	246	381	860	202	91	87
9	46	54	44	36	36	44	211	385	916	180	77	331
10	60	49	42	35	34	49	199	566	924	*150	84	349
11	64	49	44	31	39	62	183	769	916	129	75	249
12	*63	49	47	31	39	70	211	980	832	114	125	197
13	54	50	39	33	39	80	242	876	755	102	114	160
14	51	50	50	31	40	106	214	706	685	100	108	138
15	50	49	40	31	42	138	183	*632	*713	98	89	129
16	57	*36	29	*31	*42	134	229	638	638	91	160	167
17	80	40	36	33	43	123	353	790	590	89	368	129
18	84	40	39	34	36	110	*495	1,050	548	87	369	346
19	75	42	44	35	34	98	548	1,360	520	82	252	480
20	66	43	43	30	35	95	572	1,420	480	91	188	*408
21	72	43	38	*30	36	102	602	1,290	445	112	164	345
22	74	42	38	31	40	125	578	*1,480	421	95	136	325
23	72	39	38	33	47	194	671	1,520	377	79	129	321
24	70	39	39	34	28	226	590	1,360	337	72	138	298
25	66	43	39	39	36	199	398	1,330	321	69	134	263
26	63	44	39	36	46	174	353	1,400	284	69	164	235
27	60	46	39	36	38	157	353	1,420	242	69	138	205
28	57	43	43	39	38	160	475	1,460	226	74	106	188
29	56	33	40	38	-	152	671	1,480	214	69	100	170
30	50	47	34	34	-----	152	839	1,510	208	66	93	152
31	44	-----	38	34	-----	154	-----	1,490	-----	58	98	-----
Total	1,704	1,374	1,249	1,085	1,041	3,182	11,033	32,130	19,840	3,570	4,394	6,418
Mean	55.0	45.8	40.3	35.0	37.2	103	368	1,036	661	115	142	214
Ac-ft	3,380	2,730	2,480	2,150	2,060	6,310	21,880	63,730	39,350	7,080	8,720	12,730

Calendar year 1960: Max 2,120 Min 24 Mean 380 Ac-ft 276,200  
 Water year 1960-61: Max 1,520 Min 24 Mean 238 Ac-ft 172,600

Peak discharge (base, 1,500 cfs).--May 22 (10:30 p.m.) 1,870 cfs (4.79 ft).

\* Discharge measurement made on this day.

## SAN JUAN RIVER BASIN

9-3430. Rio Blanco near Pagosa Springs, Colo.

Location.--Lat 37°12'46", long 106°47'38", in center of sec.1, T.34 N., R.1 E., on right bank 40 ft downstream from highway bridge, 0.4 mile upstream from Leche Creek, 1½ miles downstream from Fish Creek, and 12.5 miles southeast of Pagosa Springs.

Drainage area.--58.0 sq mi.

Records available.--May 1935 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,950 ft (from topographic map).

Average discharge.--26 years, 85.9 cfs (62,190 acre-ft per year).

Extremes.--Maximum discharge during year, 492 cfs Sept. 18 (gage height, 2.15 ft); minimum daily, 7 cfs Dec. 6.  
1935-61: Maximum discharge, about 1,600 cfs July 26 or 27, 1957; maximum gage height, 4.12 ft June 18, 1949; minimum daily discharge, 3.0 cfs Oct. 10, 1956.  
Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 350 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 17 to Apr. 6)

Oct. 1 to Mar. 16

Mar. 17 to Sept. 30

0.9 8.0  
1.0 16  
1.1 26  
1.2 43

0.6 9.5  
.8 20  
1.0 37  
1.2 68  
1.5 153  
2.0 375

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.8	10	9	10	9	8	3.5	302	276	47	21	26
2	9.6	9.6	9	9.5	9.5	10	38	320	248	63	*65	24
3	9.6	*9.6	10	9	10	12	63	302	*226	52	97	45
4	9.6	11	10	9	11	10	108	*253	209	45	63	45
5	9.6	11	*9	9.5	9.5	9	*108	196	205	40	45	*57
6	8.8	10	7	10	9	8.5	70	157	188	42	32	44
7	8.8	18	9	11	8.5	*9	77	126	176	49	28	35
8	8.8	17	10	11	9	10	66	116	184	86	25	36
9	11	14	10	10	10	12	60	146	188	63	24	175
10	20	13	10	9.5	9.5	14	54	201	184	49	22	77
11	*18	14	10	9	11	17	55	258	169	*44	25	50
12	15	14	10	8.5	11	20	70	271	153	40	73	40
13	14	14	9.5	9	12	24	89	226	139	35	45	*33
14	13	15	9.6	9	12	30	60	196	*126	33	37	29
15	11	14	9.5	9	*12	36	80	176	129	30	38	35
16	15	10	8	10	12	40	126	169	111	27	86	44
17	19	9.5	9.5	*11	11	44	172	201	99	23	117	35
18	20	10	11	10	10	37	184	258	94	18	61	207
19	19	10	12	9.5	9.5	34	*169	312	94	14	44	136
20	22	10	11	9	9.5	33	188	276	89	14	34	119
21	28	10	10	8.5	10	32	196	280	89	14	32	99
22	25	10	10	8.5	11	40	209	316	82	14	29	82
23	23	9.5	10	9	12	50	209	307	75	13	44	68
24	20	9	11	9	8	64	180	*284	68	13	50	55
25	18	9.5	11	11	11	49	136	298	63	14	105	47
26	17	10	11	10	12	42	129	302	55	15	54	41
27	16	9.6	11	10	11	40	139	302	47	14	38	36
28	16	8.0	12	11	10	37	201	298	40	17	36	34
29	15	8	11	10	-	36	235	294	40	23	32	31
30	11	11	9.5	9.5	-----	36	289	289	42	20	31	29
31	10	-----	10	9.5	-----	34	-----	284	-----	18	29	-----
Total	469.6	338.3	309.6	298.5	290.0	877.5	3.795	7.716	3.888	989	1.462	1.814
Mean	15.1	11.3	9.99	9.63	10.4	28.3	126	249	130	31.9	47.2	60.5
Ac-ft	931	671	614	592	575	1,740	7,530	15,300	7,710	1,960	2,900	3,600

Calendar year 1960: Max 480 Min 7 Mean 85.4 Ac-ft 62,000  
Water year 1960-61: Max 320 Min 7 Mean 61.0 Ac-ft 44,120

Peak discharge (base, 800 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-26, Nov. 29 to Dec. 2, Dec. 4-11, 13, Dec. 15 to Mar. 16 (no gage-height record Jan. 9 to Feb. 15), Mar. 21-23, 27, 31, Apr. 2, 6, 9, 12, 14, 15.



9-3440. Navajo River at Banded Peak Ranch, near Chromo, Colo.

Location.--Lat 37°05'07", long 106°41'20", in NW¼ sec.24, T.33 N., R.2 E., on left bank at downstream side of private bridge on Banded Peak Ranch, half a mile downstream from Aspen Creek, 4 miles downstream from East Fork, and 9 miles northeast of Chromo.

Drainage area.--69.8 sq mi.

Records available.--October 1936 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 7,940.6 ft above mean sea level (river-profile survey). Prior to Oct. 1, 1949, at datum 3.00 ft higher.

Average discharge.--25 years, 105 cfs (76,020 acre-ft per year).

Extremes.--Maximum discharge during year, 530 cfs May 27 (gage height, 3.46 ft); minimum daily, 15 cfs Jan. 3.

1936-61: Maximum discharge, 1,340 cfs May 13, 1941 (gage height, 7.02 ft, present datum); minimum daily, 8.4 cfs Sept. 29, 1960, result of temporary blockage by channel alteration upstream.  
Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records fair. Diversions for irrigation of about 430 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 15 to Apr. 4)

Oct. 1 to Mar. 14

Mar. 15 to Sept. 30

1.4	14	1.1	38	2.5	222
1.6	25	1.5	60	3.0	350
2.0	60	1.9	104	3.5	550

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	28	20	17	18	20	41	355	423	60	52	44
2	23	28	21	16	18	20	42	377	387	90	65	44
3	23	28	21	15	19	22	55	374	*323	97	*103	44
4	23	*27	18	16	18	22	80	*329	297	86	75	48
5	24	26	17	17	18	22	*86	261	299	77	62	*55
6	24	27	*17	18	19	22	70	209	302	77	55	51
7	26	35	19	19	18	*20	72	176	302	86	51	48
8	26	29	21	19	19	19	66	150	297	134	48	46
9	29	27	22	18	20	20	63	166	297	101	46	82
10	26	23	22	19	20	20	63	231	302	83	50	64
11	*26	21	23	18	20	20	65	302	286	72	72	55
12	23	20	24	18	22	22	76	341	268	*66	114	51
13	22	21	24	17	22	24	80	310	254	61	67	49
14	21	21	24	17	22	28	70	249	*237	61	60	48
15	22	21	20	18	*20	41	73	218	246	56	62	54
16	27	19	22	18	20	41	97	209	222	54	90	54
17	30	17	20	17	22	39	154	231	209	51	85	49
18	31	18	20	*18	20	38	*204	289	202	51	73	187
19	28	19	20	18	20	38	211	353	191	47	60	144
20	28	20	20	18	20	38	242	374	176	47	55	115
21	31	19	20	18	20	38	231	353	154	48	50	97
22	33	19	19	19	22	40	246	412	144	44	50	86
23	33	19	20	20	22	46	251	435	129	42	80	85
24	31	17	20	20	20	48	222	*387	129	42	70	74
25	30	20	20	22	20	45	174	408	122	41	200	63
26	30	20	20	20	22	43	168	401	109	43	120	55
27	30	17	20	22	22	42	170	423	101	42	80	53
28	30	18	20	20	20	41	229	435	96	63	60	51
29	30	18	20	20	-	41	273	427	90	61	50	49
30	26	20	18	18	-----	40	315	427	75	54	55	48
31	25	-----	18	18	-----	40	-----	427	-----	54	50	-----
Total	835	662	630	568	563	1,000	4,189	10,040	6,669	1,991	2,210	1,993
Mean	26.9	22.1	20.3	18.3	20.1	32.3	140	324	222	64.2	71.3	66.4
Ac-ft	1,660	1,310	1,250	1,130	1,120	1,980	8,310	19,910	13,230	3,950	4,380	3,950

Calendar year 1960: Max 525 Min 8.4 Mean 103 Ac-ft 74,450  
Water year 1960-61: Max 435 Min 15 Mean 85.9 Ac-ft 62,180

Peak discharge (base, 530 cfs)--May 27 (10 p.m.) 530 cfs (3.46 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-19, 21-24, 27, 29, Dec. 1, 4, 6, Dec. 15 to Mar. 14. No gage-height record June 30 to July 2, Aug. 20 to Sept. 5.

## SAN JUAN RIVER BASIN

9-3443. Navaajo River above Chromo, Colo.

Location.--Lat 37°01'55", long 106°43'56", in NE $\frac{1}{4}$  sec.9, T.32 N., R.2 E., on right bank 5 ft downstream from private road bridge, 6 miles east of Chromo, and 7 miles upstream from Little Navaajo River.

Drainage area.--96.4 sq mi.

Records available.--October 1956 to September 1961. Published as "near Chromo" 1956-58.

Gage.--Water-stage recorder. Altitude of gage is 7,700 ft (from topographic map).

Average discharge.--5 years, 125 cfs (90,500 acre-ft per year).

Extremes.--Maximum discharge during year, 554 cfs May 27 (gage height, 4.88 ft); minimum daily, 18 cfs Jan. 3.

1956-61: Maximum discharge, 1,340 cfs June 7, 1957 (gage height, 5.95 ft); maximum gage height, 6.13 ft during period Feb. 1-8, 1957 (ice jam); minimum daily discharge, 14 cfs Jan. 3, 1960.

Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of about 750 acres above station and about 250 acres below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.2	14	4.0	130
3.3	20	4.5	310
3.5	39	5.0	610
3.7	66		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	33	26	20	22	24	45	396	396	70	52	45
2	31	32	26	19	22	24	50	414	384	94	66	37
3	32	32	26	18	22	29	71	414	*359	97	*94	49
4	32	*32	26	19	22	29	110	*390	306	90	73	51
5	32	30	24	20	22	26	*120	302	320	84	68	*62
6	31	30	*20	22	22	24	92	234	315	82	58	60
7	33	41	24	22	22	*22	103	195	306	94	54	52
8	33	39	26	22	22	26	92	170	282	125	50	51
9	35	36	26	22	24	28	80	181	266	108	46	84
10	29	31	26	22	24	28	77	238	270	88	46	77
11	*32	30	26	22	24	28	75	320	266	79	71	63
12	28	29	26	20	26	30	92	378	254	*73	105	57
13	27	29	26	20	26	30	108	340	254	66	73	54
14	27	29	26	20	26	34	88	278	*254	66	66	51
15	27	29	26	22	*24	47	82	238	258	60	63	54
16	33	26	26	22	24	50	120	223	234	57	99	63
17	37	26	26	20	26	44	192	242	220	56	90	52
18	39	26	26	*20	26	41	*262	302	209	54	82	190
19	37	26	26	22	24	39	274	378	202	51	64	170
20	35	26	26	22	26	38	302	372	181	49	57	133
21	37	26	24	22	26	40	282	345	151	51	56	110
22	39	26	24	24	24	45	282	402	151	47	54	103
23	39	26	24	24	24	52	294	432	136	43	95	97
24	37	26	24	24	24	63	262	*426	139	41	75	88
25	36	26	24	26	24	57	202	462	115	40	195	75
26	36	26	24	24	26	49	195	444	115	44	115	64
27	35	26	24	26	26	49	188	456	110	46	82	62
28	35	26	24	24	24	47	238	432	101	51	66	58
29	36	24	22	24	-	46	310	402	97	66	57	56
30	33	24	22	22	-----	45	360	390	82	56	58	52
31	32	-----	22	22	-----	45	-----	402	-----	56	54	-----
Total	1,036	868	768	678	674	1,179	5,049	10,598	6,733	2,084	2,284	2,220
Mean	33.4	28.9	24.8	21.9	24.1	38.0	168	342	224	67.2	73.7	74.0
Ac-ft	2,050	1,720	1,520	1,340	1,340	2,340	10,010	21,020	13,350	4,130	4,530	4,400

Calendar year 1960: Max 575 Min 14 Mean 117 Ac-ft 84,660

Water year 1960-61: Max 462 Min 18 Mean 93.6 Ac-ft 67,750

Peak discharge (base, 550 cfs)--May 27 (10:30 p.m.) 554 cfs (4.88 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Feb. 25 (no gage-height record Dec. 27 to Feb. 15), Feb. 28 to Mar. 2, Mar. 5-14.

9-3460. NavaJo River at Edith, Colo.

Location.--Lat 37°00'10", long 106°54'25", in NW<sup>1</sup> sec.24, T.32 N., R.1 W., on right bank at Colorado-New Mexico State line, 290 ft downstream from highway bridge, a quarter of a mile east of Edith, and 1 mile upstream from Coyote Creek. Prior to June 21, 1961, at site 50 ft downstream.

Drainage area.--172 sq mi.

Records available.--September 1912 to September 1961. Monthly or yearly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 7,033.00 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1929, staff gage at site 240 ft upstream at different datum. June 2, 1935, to June 27, 1941, water-stage recorder at sites 210 and 240 ft upstream at datum 2.0 ft higher. June 28, 1941, to June 20, 1961, at site 50 ft downstream at same datum.

Average discharge.--49 years, 161 cfs (116,600 acre-ft per year).

Extremes.--Maximum discharge during year, 580 cfs May 23 (gage height, 4.35 ft); maximum gage height, 4.61 ft Mar. 15 (ice jam); minimum daily discharge, 22 cfs Dec. 6.

1935-61: Maximum discharge, 2,840 cfs Apr. 23, 1942 (gage height, 6.55 ft), from rating curve extended above 1,100 cfs; minimum daily, 8 cfs Sept. 25, 1953.

Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 1,700 acres above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 24 to June 20)

Oct. 1 to June 20

June 21 to Sept. 30

2.3	14	3.3	180	2.9	24
2.5	26	3.6	290	3.1	50
2.7	47	4.0	465	3.4	112
3.0	98	4.5	775	4.0	270

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	36	28	26	26	28	73	402	465	73	50	46
2	29	36	30	24	26	28	80	430	440	93	60	34
3	30	35	30	24	28	34	132	440	*374	131	*95	46
4	31	*34	30	24	26	34	187	*410	330	112	64	55
5	31	33	26	24	26	34	*201	338	338	95	65	*58
6	31	33	*22	24	26	30	121	278	334	84	55	64
7	33	46	28	24	26	*32	184	240	330	102	50	55
8	34	43	32	26	26	34	184	212	326	129	46	52
9	37	37	32	26	28	38	116	203	326	126	40	82
10	34	32	32	24	28	44	110	*274	342	110	37	88
11	*34	30	30	26	30	55	94	338	338	95	58	67
12	34	30	30	26	30	60	119	388	310	*84	102	62
13	32	30	32	24	30	75	158	379	290	73	65	55
14	32	30	30	24	32	100	119	310	*266	71	60	52
15	31	31	30	24	*32	120	96	274	282	65	52	50
16	36	27	28	26	30	110	140	254	258	58	95	62
17	46	27	28	26	32	100	222	270	240	60	84	53
18	48	28	28	*26	32	60	274	326	232	52	90	160
19	45	29	28	26	32	51	302	392	222	46	64	204
20	40	29	28	26	32	47	326	415	200	47	53	148
21	42	28	28	26	30	54	318	379	*180	46	50	124
22	43	28	26	28	30	64	322	465	163	44	55	114
23	43	27	28	28	30	90	338	509	153	40	75	105
24	41	27	28	30	32	103	322	*440	150	37	65	98
25	40	27	30	32	34	80	246	455	141	36	184	84
26	39	28	30	32	34	63	226	440	129	42	119	67
27	40	30	30	30	30	58	215	465	119	44	78	64
28	39	27	32	32	28	57	250	498	112	43	58	58
29	37	27	30	30		60	318	482	105	62	50	55
30	35	28	26	28	-----	63	362	470	95	55	44	53
31	34	-----	26	26	-----	61	-----	455	-----	57	49	-----
Total	1.126	9.33	8.96	8.22	8.26	1.867	6.155	1.636	7.590	2.212	2.112	2.315
Mean	36.3	31.1	28.9	26.5	29.5	60.2	205	375	253	71.4	68.1	77.2
Ac-ft	2,230	1,850	1,780	1,630	1,640	3,700	12,210	23,080	15,050	4,390	4,190	4,590

Calendar year 1960: Max 684 Min 16 Mean 140 Ac-ft 101,900  
Water year 1960-61: Max 509 Min 22 Mean 105 Ac-ft 76,340

Peak discharge (base, 600 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 30 to Mar. 18. No gage-height record Jan. 18 to Feb. 15, June 20, 21.

## SAN JUAN RIVER BASIN

9-3495. Piedra River near Piedra, Colo.

Location.--Lat 37°14'00", long 107°20'30", in sec.8, T.34 N., R.4 W., on left bank a quarter of a mile upstream from bridge on U. S. Highway 160, three-quarters of a mile upstream from Yellow Jacket Creek, and 1½ miles north of Piedra.

Drainage area.--371 sq mi.

Records available.--October 1911 to September 1912, October 1938 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Published as "at Piedra" 1912.

Gage.--Water-stage recorder. Altitude of gage is 6,530 ft (from topographic map). Nov. 26, 1911, to July 22, 1912, staff gages at sites a quarter to half a mile downstream at different datums. Jan. 11, 1939, to Mar. 19, 1940, and May 10 to Sept. 27, 1941, chain gage at site 50 ft upstream at same datum. Mar. 20, 1940, to May 9, 1941, water-stage recorder at site 1½ miles upstream at datum about 55 ft higher.

Average discharge.--24 years, 324 cfs (234,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,560 cfs May 20 (gage height, 4.68 ft); minimum daily, 38 cfs Dec. 7. 1938-61: Maximum discharge, 6,870 cfs July 26, 1957 (gage height, 8.60 ft), from rating curve extended above 2,800 cfs; minimum daily, 17 cfs Nov. 11, 1950.

Maximum flood known occurred Oct. 5, 1911. Another major flood occurred June 29, 1927.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,220 acres above station. Also two small ditches divert water above station for irrigation below. Piedra Pass and Squaw Pass ditches (see elsewhere in this report) export small amount of water above station to Rio Grande basin.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	33	3.0	355
1.8	64	3.5	590
2.2	130	4.5	1,430
2.5	195		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	68	50	50	43	46	91	1,020	1,120	138	65	112
2	49	*68	50	50	46	46	103	*1,130	1,010	140	220	101
3	47	68	52	50	44	47	208	1,070	838	142	195	110
4	46	67	54	52	44	47	341	1,000	692	134	*180	134
5	45	67	*56	54	46	47	352	790	664	117	188	*132
6	45	67	50	56	46	45	*260	638	*626	99	142	128
7	44	89	38	54	46	46	285	560	640	96	117	117
8	43	94	50	52	46	*46	268	465	660	132	103	103
9	48	78	52	52	44	46	238	455	660	110	112	252
10	*75	70	50	52	44	48	238	608	657	*105	99	404
11	83	68	50	50	45	50	198	846	644	91	99	278
12	81	62	52	50	45	56	247	1,080	614	83	117	223
13	65	59	50	48	45	57	310	968	550	77	146	190
14	60	62	50	44	45	65	260	720	500	71	130	168
15	62	62	48	42	45	77	212	638	510	72	123	162
16	70	46	50	44	*46	103	268	638	505	62	160	164
17	119	46	48	44	47	105	408	783	440	58	288	144
18	123	50	52	*40	46	116	555	986	355	58	338	183
19	96	50	52	40	44	98	602	1,200	341	58	271	355
20	83	50	50	42	44	86	650	1,320	320	60	202	288
21	81	48	50	42	46	92	678	1,180	306	81	170	264
22	83	48	52	42	46	132	650	*1,280	285	67	152	250
23	83	46	50	42	47	180	727	1,260	257	58	142	250
24	86	44	52	42	46	223	664	1,160	235	53	144	244
25	83	46	50	42	46	170	470	1,110	215	51	140	218
26	80	50	50	44	48	114	418	1,110	192	51	144	202
27	80	50	50	45	46	98	418	1,160	170	75	126	185
28	77	48	51	45	44	98	540	1,170	144	89	116	170
29	75	48	52	46	-	89	720	1,160	138	119	110	158
30	68	48	54	46	-----	84	926	1,130	142	92	107	146
31	64	-----	50	46	-----	84	-----	1,150	-----	74	119	-----
Total	2,190	1,767	1,565	1,448	1,275	2,641	12,305	29,785	14,430	2,713	4,765	5,835
Mean	70.6	58.9	50.5	46.7	45.5	85.2	410	961	481	87.5	154	194
Ac-ft	4,340	3,500	3,100	2,870	2,530	5,240	24,410	59,080	28,620	5,380	9,450	11,570

Calendar year 1960: Max 1,580 Min 38 Mean 327 Ac-ft 237,300  
 Water year 1960-61: Max 1,320 Min 38 Mean 221 Ac-ft 160,100

Peak discharge (base, 1,300 cfs)--May 2 (2 a.m.) 1,310 cfs (4.38 ft); May 20 (1 a.m.) 1,560 cfs (4.68 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-27, Nov. 29 to Dec. 4, Dec. 6-27, Dec. 29 to Jan. 23, Jan. 26, Jan. 29 to Feb. 10, Feb. 19-22, 24, 25, Feb. 28 to Mar. 2, Mar. 7-11.



9-3505. San Juan River at Rosa, N. Mex.

Location.--Lat 37°00'20", long 107°24'10", in SW $\frac{1}{4}$  sec.21, T.32 N., R.5 W., on right bank 75 ft upstream from highway bridge, a quarter of a mile downstream from Piedra River, 0.9 mile upstream from Colorado-New Mexico State line, and 1 mile north of Rosa.

Drainage area.--1,990 sq mi, approximately.

Records available.--July to November 1895, May 1896 to December 1897, April to December 1898, May to September 1899, September 1910 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Prior to October 1920, published as two stations, Piedra and San Juan Rivers at Arboles, Colo., sum of which is equivalent.

Gage.--Water-stage recorder. Altitude of gage is 5,980 ft (from river-profile map). Prior to Oct. 1, 1920, at sites on Piedra and San Juan Rivers at Arboles, Colo. (see WSP 1313 for descriptions). Oct. 1, 1920, to Apr. 12, 1922, chain gage at site 75 ft downstream at different datum. Apr. 13, 1922, to Sept. 18, 1930, water-stage recorder at site 550 ft upstream at datum 0.7 ft higher. Sept. 19, 1930, to Aug. 31, 1938, water-stage recorder at sites 330 and 430 ft upstream at datum 1.0 ft higher. Sept. 1, 1938, to Dec. 19, 1949, water-stage recorder at present site at datum 1.0 ft higher.

Average discharge.--52 years (1896-97, 1910-61), 752 cfs (881,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,560 cfs May 20 (gage height, 5.69 ft); minimum daily, 70 cfs Dec. 6. 1920-61: Maximum discharge, about 25,000 cfs June 29, 1927 (gage height, 13.5 ft, from estimated graph, site and datum then in use), from rating curve extended above 8,000 cfs by logarithmic plotting; minimum daily, 39 cfs Oct. 8, 1956. Maximum flood known occurred Oct. 5, 1911. A major flood occurred Sept. 5 or 6, 1909.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 14,000 acres above station.

Cooperation.--Records furnished by New Mexico district.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	58	2.0	285	3.5	1,170
1.3	104	2.5	489	4.5	2,320
1.6	168	3.0	780	5.5	3,990

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	106	173	166	b100	b120	b130	894	3,200	3,540	505	208	314
2	108	176	161	b90	b120	b130	865	3,500	3,330	499	231	292
3	127	173	171	b80	b120	184	1,090	3,520	2,840	591	625	262
4	125	173	195	b80	b120	190	1,660	3,320	2,350	536	647	401
5	125	173	b140	b80	b120	182	2,210	2,660	2,310	479	586	393
6	121	171	b70	b80	b110	b150	1,240	2,170	2,150	419	505	406
7	121	219	b100	b90	b100	b140	1,500	1,860	2,090	419	361	365
8	114	285	b160	b100	b110	b130	2,160	1,580	2,060	547	299	321
9	136	228	b160	b100	b120	b120	1,400	1,420	2,120	625	285	429
10	166	195	b150	b120	b120	205	1,220	1,760	2,190	515	262	1,180
11	192	176	b150	b120	b130	274	937	2,290	2,180	423	365	816
12	203	173	b150	b120	b150	346	930	3,220	2,060	369	340	642
13	190	166	b150	b120	b150	383	1,290	3,130	1,890	335	505	531
14	166	173	b150	b120	b150	443	1,120	2,470	1,750	299	433	465
15	179	173	b150	b120	b150	600	837	2,170	1,660	292	410	451
16	200	b160	b140	b120	b170	718	942	1,970	1,770	272	515	505
17	303	b120	b110	b120	b170	642	1,390	2,180	1,520	249	823	441
18	410	b130	b105	b120	b170	563	1,910	2,760	1,360	234	1,260	846
19	332	b130	b110	b120	b130	499	2,190	3,370	1,310	222	908	2,000
20	249	b125	b110	b120	b130	463	2,290	3,950	1,220	214	642	1,240
21	234	b125	b110	b120	b140	512	2,470	3,420	1,130	265	525	1,020
22	243	b125	b110	b120	b150	676	2,320	3,740	1,060	299	484	945
23	240	b125	b110	b120	b150	901	2,570	3,940	975	228	432	872
24	240	b115	b110	b130	b130	1,220	2,490	3,590	930	198	521	872
25	237	b115	b110	b130	b130	1,060	1,830	3,520	858	179	471	747
26	219	b115	b110	b130	b150	760	1,590	3,350	773	168	636	690
27	214	b130	b110	b150	b130	552	1,430	3,590	684	173	470	614
28	208	b130	b130	b150	b130	575	1,700	3,670	597	214	385	547
29	208	b115	b130	b140	-	922	2,250	3,660	552	252	325	505
30	200	b100	b120	b130	-----	997	2,760	3,620	541	285	310	460
31	184	-----	b110	b120	-----	848	-----	3,610	-----	225	314	-----
Total	6,100	4,687	4,058	3,560	3,770	15,515	49,485	92,210	49,800	105,300	150,830	195,720
Mean	197	156	131	115	135	500	1,650	2,975	1,660	340	487	652
Ac-ft	12,100	9,300	8,050	7,060	7,480	30,770	98,150	182,900	98,780	20,890	29,920	38,820

Calendar year 1960: Max 6,010 Min 70 Mean 1,113 Ac-ft 807,800  
 Water year 1960-61: Max 3,950 Min 70 Mean 752 Ac-ft 544,200

Peak discharge (base, 4,000 cfs).--May 2 (7:00 a.m.) 4,050 cfs (5.49 ft); May 20 (8:00 a.m.) 4,560 cfs (5.69 ft).

<sup>b</sup> Stage-discharge relation affected by ice.

## SAN JUAN RIVER BASIN

9-3530. Vallecito Reservoir near Bayfield, Colo.

Location--Lat 37°23'00", long 107°34'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.18, T.36 N., R.6 W., in gatehouse above outlet gates at Vallecito Dam on Los Pinos (Pine) River, 350 ft left of spillway, a quarter of a mile upstream from Little Red Creek, and 11 miles northeast of Bayfield.

Records available--April 1941 to September 1961.

Gage--Float gage read once a day. Datum of gage is 7,580 ft above mean sea level (Bureau of Reclamation bench mark); gage readings have been reduced to elevations above mean sea level.

Extremes--Maximum contents observed during year, 120,000 acre-ft June 12 (elevation, 7,662.69 ft); minimum observed, 35,360 acre-ft Oct. 17 (elevation, 7,623.76 ft).

1941-61: Maximum contents observed, 128,200 acre-ft July 27, 1957 (elevation, 7,665.72 ft); minimum observed, 1,520 acre-ft Oct. 24, 25, 1944 (elevation, 7,584.10 ft). No usable storage prior to April 1941.

Remarks--Reservoir is formed by an earth- and rock-fill dam; dam completed in March 1941. Capacity of reservoir, 126,280 acre-ft between elevations 7,580 (sill of outlet gate) and 7,665 ft (top of spillway gates). Dead storage, 3,395 acre-ft. Figures given herein represent usable contents. Reservoir is used to store water for irrigation in Los Pinos (Pine) River basin.

Cooperation--Records furnished by Bureau of Reclamation.

Month-end elevation and contents, water year October 1960 to September 1961

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	7,627.6	41,470	-
Oct. 31.....	7,624.3	36,180	-5,290
Nov. 30.....	7,626.3	39,340	+3,160
Dec. 31.....	7,627.2	40,810	+1,470
Calendar year 1960.....	-	-	+5,390
Jan. 31.....	7,627.6	41,470	+660
Feb. 28.....	7,627.9	41,970	+500
Mar. 31.....	7,629.2	44,200	+2,230
Apr. 30.....	7,636.8	58,470	+14,270
May 31.....	7,658.7	109,500	+51,030
June 30.....	7,661.0	115,600	+6,100
July 31.....	7,650.4	88,740	-26,860
Aug. 31.....	7,643.7	73,160	-15,580
Sept. 30.....	7,640.5	66,160	-7,000
Water year 1960-61.....	-	-	+24,690

† Elevation at 8 a.m.

## SAN JUAN RIVER BASIN

303

9-3535. Los Pinos River near Bayfield, Colo.  
(Locally known as Pine River)

Location---Lat 37°23'00" (corrected), long 107°34'30", in SW $\frac{1}{4}$  sec. 18, T.36 N., R.6 W., on left side of outlet flume from Vallecito Reservoir, a quarter of a mile upstream from Little Red Creek, 2 miles upstream from Red Creek, and 11 miles north of Bayfield.

Drainage area---270 sq mi, approximately.

Records available---October 1927 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage---Water-stage recorder and concrete weir. Datum of gage is 7,582.54 ft above mean sea level (Bureau of Reclamation bench mark). Oct. 26, 1927, to Aug. 17, 1956, at sites 2 $\frac{1}{4}$  miles downstream with datum of gage at 7,415.58 ft above mean sea level, adjustment of 1912, prior to July 8, 1934, and at 7,415.08 ft above mean sea level July 9, 1934, to Aug. 17, 1956. Since Aug. 18, 1956, supplementary water-stage recorder at former site 2 $\frac{1}{4}$  miles downstream for use when upper spillway at Vallecito Reservoir is operating.

Average discharge---34 years, 351 cfs (254,100 acre-ft per year).

Extremes---Maximum discharge during year, 2,070 cfs Apr. 3 (gage height, 4.13 ft); minimum daily, 36 cfs Apr. 4. 1927-61: Maximum discharge, 13,800 cfs July 27, 1957 (gage height, 12.2 ft, from floodmarks at supplementary gage), from rating curve extended above 2,500 cfs on basis of slope-area measurement of peak flow (result of automatic spillway gates releasing from Vallecito Reservoir); minimum daily, 3.2 cfs Feb. 11, 1951 (result of storage in Vallecito Reservoir); minimum daily prior to construction of Vallecito Reservoir, 38 cfs Dec. 21, 22, 1937. Maximum flood known prior to construction of Vallecito Reservoir occurred Oct. 5, 1911.

Remarks---Records good. Flow regulated by storage in Vallecito Reservoir (see preceding page). Transmountain diversions above station by Raber-Lohr and Fuchs ditches (see elsewhere in this report).

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

0.3	31	1.5	393
.4	49	2.0	618
.7	115	3.0	1,200
1.0	205		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	322	64	44	44	44	44	45	42	1,020	684	599	460
2	322	64	44	44	44	44	45	42	867	684	594	456
3	322	53	44	44	44	44	73	44	715	684	560	456
4	318	45	44	44	44	44	36	44	674	664	522	456
5	294	45	44	44	44	44	38	134	674	638	491	456
6	283	45	44	44	44	44	38	219	674	638	491	447
7	279	45	44	44	44	44	38	240	674	638	491	*422
8	279	45	44	44	44	44	38	240	674	638	491	422
9	279	45	44	44	44	44	45	240	679	633	509	422
10	279	45	44	44	44	44	45	247	679	a 613	527	422
11	279	45	44	44	44	45	38	318	679	a 588	551	422
12	275	42	44	44	44	45	38	*365	804	a 583	570	405
13	275	42	44	44	44	45	38	409	980	a 578	565	381
14	275	42	*44	44	44	45	38	426	809	a 558	560	381
15	275	42	44	44	44	45	40	426	849	a 558	546	381
16	233	42	44	44	44	45	40	456	926	a 558	532	381
17	202	42	44	44	44	45	40	500	832	a 610	487	381
18	137	*42	44	44	44	45	40	513	710	684	443	381
19	110	42	44	44	44	45	*40	560	679	684	443	381
20	110	42	44	44	44	45	38	613	654	684	443	381
21	110	42	44	44	*44	45	38	628	644	638	443	381
22	110	42	44	44	44	45	38	649	644	594	438	381
23	110	42	44	*44	44	45	38	689	644	608	434	381
24	110	42	44	44	44	*45	38	694	644	618	447	381
25	110	42	44	44	44	45	40	694	644	608	456	381
26	110	42	44	44	44	45	40	700	644	589	456	381
27	110	42	44	44	44	45	40	720	644	589	456	381
28	110	42	44	44	44	45	40	781	638	599	456	381
29	110	42	44	44	-	45	42	896	638	604	456	381
30	110	42	44	44	-----	45	42	1,080	664	604	456	381
31	79	-----	44	44	-----	45	-----	915	-----	*599	460	-----
Total	6,327	1,339	1,364	1,364	1,232	1,387	1,213	1,452	2,170	1,924	1,537	1,210
Mean	204	44.6	44.0	44.0	44.0	44.7	40.4	469	723	621	496	403
Ac-ft	12,550	2,660	2,710	2,710	2,440	2,750	2,410	28,810	43,040	38,180	30,490	24,010

Calendar year 1960: Max 1,000 Min 35 Mean 319 Ac-ft 231,500  
Water year 1960-61: Max 1,080 Min 36 Mean 266 Ac-ft 192,800

\* Discharge measurement made on this day.

a No gage-height record.

## SAN JUAN RIVER BASIN

9-3540. Los Pinos River at Ignacio, Colo.  
(Locally known as Pine River)

Location.--Lat 37°07'45", long 107°37'50", in S½ sec.5, T.33 N., R.7 W., on downstream wingwall of left abutment of highway bridge, three-quarters of a mile upstream from Ignacio, 2 miles upstream from Rock Creek, and 6 miles south of Bayfield.

Drainage area.--448 sq mi.

Records available.--April 1899 to May 1900, April to September 1901, April to June 1902, April to October 1903, September 1910 to September 1961 (discontinued). Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,468.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1940. Prior to Mar. 5, 1912, staff or chain gages on bridge at same site at different datums. Mar. 5, 1912, to Apr. 5, 1924, chain gage and Apr. 6, 1924, to Feb. 22, 1930, water-stage recorder, at same site at datum 0.18 ft higher.

Average discharge.--30 years (1910-40), 374 cfs (prior to completion of Vallecito Dam); 21 years (1940-61), 214 cfs (154,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,100 cfs May 31 (gage height, 3.65 ft); minimum daily, 20 cfs Nov. 3. 1924-61: Maximum discharge, 7,000 cfs June 29, 1927 (gage height, 7.3 ft, datum then in use), from rating curve extended above 3,000 cfs by logarithmic plotting; minimum daily, 1.3 cfs Sept. 8, 1933. Maximum flood known occurred Oct. 5, 1911. A major flood occurred Sept. 5 or 6, 1909.

Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Flow regulated by Vallecito Reservoir (see elsewhere in this report) since April 1941. Diversions for irrigation of about 25,000 acres above station.

Cooperation.--Records furnished by New Mexico district.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	18	1.6	47	2.2	168	3.0	545
1.4	27	1.9	92	2.5	277	3.5	950

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	25	55	b 45	b 55	b 50	192	141	571	153	80	64
2	54	22	60	b 45	b 60	b 60	178	126	449	165	87	62
3	51	20	60	b 45	b 60	68	216	111	234	182	203	72
4	46	22	b 60	b 45	b 50	68	253	64	162	192	111	78
5	45	22	b 45	b 45	b 45	69	273	60	153	141	62	75
6	42	21	b 30	b 45	b 45	64	185	92	120	136	59	70
7	40	44	b 60	b 45	b 45	b 60	321	107	111	150	55	64
8	43	69	66	b 50	b 45	b 50	415	89	109	209	45	63
9	55	62	69	b 50	b 50	b 55	261	82	107	178	43	105
10	62	60	b 55	b 50	b 55	b 70	241	60	109	216	46	107
11	58	63	b 55	b 45	66	96	212	72	113	136	51	77
12	55	60	b 55	b 45	64	123	212	84	163	118	56	85
13	46	59	b 60	b 45	69	138	241	82	414	102	52	87
14	41	52	b 60	b 45	85	168	216	82	346	90	62	82
15	54	52	b 60	b 45	92	195	182	78	293	78	68	89
16	147	55	b 50	b 45	90	195	195	55	414	70	80	96
17	88	52	b 50	b 45	85	165	226	60	356	68	168	89
18	174	54	b 45	b 45	74	162	261	58	257	130	132	138
19	66	52	b 45	b 45	b 68	133	277	58	202	153	157	165
20	51	52	b 45	b 45	b 65	141	286	56	159	150	107	171
21	46	50	b 45	b 45	b 68	165	286	68	128	138	98	165
22	43	51	b 45	b 45	b 70	178	253	69	113	87	94	175
23	39	54	b 45	b 45	b 65	185	249	98	118	80	84	171
24	39	58	b 45	b 50	b 55	199	241	133	128	84	78	156
25	38	58	b 45	b 55	b 55	168	195	133	126	80	78	144
26	36	56	b 45	b 55	66	130	171	141	113	75	77	178
27	35	60	b 45	b 55	66	120	156	147	96	74	70	182
28	36	b 45	b 50	b 55	b 55	141	147	223	92	66	63	178
29	32	b 45	b 50	b 45	-	162	126	318	100	75	53	209
30	30	54	b 45	b 45	-----	182	133	664	120	84	64	253
31	28	-----	b 45	b 45	-----	178	-----	770	-----	92	65	-----
Total	1,669	1,449	1,590	1,455	1,768	3,938	6,800	4,381	6,076	3,752	2,554	3,650
Mean	53.8	48.3	51.3	46.9	63.1	127	227	141	203	121	82.4	122
Ac-ft	3,310	2,870	3,150	2,890	3,510	7,810	13,490	8,690	12,050	7,440	5,070	7,240

Calendar year 1960: Max 1,150 Min 20 Mean 152 Ac-ft 110,400  
Water year 1960-61: Max 770 Min 20 Mean 107 Ac-ft 77,520

b Stage-discharge relation affected by ice.



9-3545. Los Pinos River at La Boca, Colo.  
(Locally known as Pine River)

Location.--Lat 37°00'40", long 107°35'55", in S $\frac{1}{2}$  sec.15, T.32 N., R.7 W., on downstream end of right abutment of The Denver and Rio Grande Western Railroad Co. bridge at southeast edge of La Boca, 0.1 mile upstream from Spring Creek and 13 miles upstream from mouth.

Drainage area.--510 sq mi, approximately.

Records available.--October 1950 to September 1961. Monthly discharge only for some periods, published in WSP 1733.

Gage.--Water-stage recorder. Datum of gage is 6,143.58 ft above mean sea level, datum of 1929.

Average discharge.--11 years, 195 cfs (141,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,100 cfs May 31 (gage height, 5.38 ft); minimum daily, 36 cfs Nov. 3-6.

1950-61: Maximum discharge, 6,400 cfs July 27, 1957 (gage height, 8.95 ft); minimum daily, 14 cfs Apr. 23, 24, 26, 1951.  
Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Flow regulated by Vallecito Reservoir (see elsewhere in this report). Diversions for irrigation of about 33,000 acres above station.

Cooperation.--Records furnished by New Mexico district.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 10-19, 25-28, Mar. 3-6, 10-16, 18, 21, 29, 30, Apr. 6-12, July 26 to Aug. 24, Sept. 16-30)

3.0	23	4.0	240
3.2	38	4.5	480
3.4	64	5.0	830
3.6	112	5.5	1,280

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	41	62	b 55	b 65	b 60	a 250	161	a 800	219	152	115
2	102	38	69	b 55	b 70	b 75	a 240	146	a 600	236	146	110
3	102	36	71	b 55	b 70	82	a 260	102	a 400	268	332	126
4	92	36	b 65	b 55	b 65	85	a 280	73	a 300	284	205	158
5	87	36	b 60	b 55	b 60	92	a 300	78	a 200	226	132	146
6	85	36	b 40	b 55	b 55	92	194	115	167	212	126	132
7	85	48	b 65	b 55	b 55	b 80	316	143	155	230	118	140
8	82	85	b 70	b 60	b 55	b 70	567	126	158	304	115	123
9	100	69	b 75	b 60	b 70	b 80	292	107	155	252	94	170
10	120	62	a 70	b 60	107	115	260	85	155	296	80	240
11	104	62	a 65	b 55	100	161	222	85	158	212	97	161
12	97	62	a 65	b 55	110	198	212	97	174	188	123	155
13	90	60	a 65	b 55	115	208	256	100	426	177	118	152
14	80	60	a 70	b 55	137	212	233	110	395	149	134	140
15	107	60	b 70	b 55	155	248	191	102	308	143	146	149
16	329	62	a 65	b 55	120	248	202	94	504	126	164	149
17	231	61	a 60	b 55	112	d 200	236	85	432	123	282	134
18	483	61	a 55	b 55	85	198	276	85	312	170	240	198
19	180	62	a 55	b 55	78	d 170	300	80	260	212	264	248
20	107	62	a 55	b 55	b 80	d 180	308	82	230	198	164	212
21	87	61	a 55	b 55	b 85	202	308	90	188	202	152	205
22	78	62	a 55	b 55	b 90	a 220	284	104	170	152	149	208
23	69	66	a 55	b 55	b 85	a 240	268	123	177	123	132	205
24	69	73	a 55	b 60	b 65	a 260	260	170	194	137	123	188
25	69	69	a 55	b 65	73	a 250	205	174	180	129	134	170
26	64	71	a 55	b 65	80	a 230	184	184	177	120	134	205
27	62	73	a 55	b 65	76	a 200	167	a 195	161	120	115	198
28	61	55	a 65	b 65	71	a 210	158	a 300	161	107	110	188
29	54	b 55	b 65	b 55	-	260	132	a 400	158	118	107	202
30	47	b 66	b 55	b 55	-----	288	143	a 600	177	149	118	248
31	44	-----	b 55	b 55	-----	a 240	-----	a 900	-----	155	118	-----
Total	3,457	1,750	1,897	1,765	2,389	5,454	7,504	5,296	8,032	5,737	4,624	5,175
Mean	112	58.3	61.2	56.9	85.3	176	250	171	268	185	149	172
Ac-ft	6,860	3,470	3,760	3,500	4,740	10,820	14,880	10,500	15,930	11,380	9,170	10,260

Calendar year 1960: Max 1,210 Min 36 Mean 200 Ac-ft 144,900  
Water year 1960-61: Max 900 Min 36 Mean 145 Ac-ft 105,300

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

## SAN JUAN RIVER BASIN

9-3550. Spring Creek at La Boca, Colo.

Location.--Lat 37°00'50", long 107°35'40", in S $\frac{1}{2}$  sec. 15, T.32 N., R.7 W., on right bank in an excavated channel, a quarter of a mile upstream from mouth and a quarter of a mile east of La Boca.

Drainage area.--58 sq mi, approximately.

Records available.--October 1950 to September 1961. Monthly discharge only for some periods, published in WSP 1733.

Gage.--Water-stage recorder. Altitude of gage is 6,160 ft (from topographic map).

Average discharge.--11 years, 28.3 cfs (20,490 acre-ft per year).

Extremes.--Maximum discharge during year, 292 cfs Oct. 18 (gage height, 3.26 ft); minimum daily, 1 cfs for several days during period of ice effect.

1951-61: Maximum discharge, 362 cfs July 19, 1957 (gage height, 3.97 ft), from rating curve extended above 100 cfs by logarithmic plotting; maximum gage height, 5.98 ft Mar. 9, 1960; minimum daily discharge determined, 1 cfs Feb. 25, 26, 1951, for several days during period of ice effect in 1960-61.

Remarks.--Records good except those for periods of ice effect, doubtful or no gage-height record, which are poor. Discharge measurements generally made twice a month. Part of flow is return waste from irrigation.

Cooperation.--Records furnished by New Mexico district.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 29 to Aug. 5)

0.5	1.2	1.3	29
.6	2.7	1.6	50
.7	4.7	2.0	91
1.0	14	2.7	186

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	18	b4	b2	b3	b4	d19	10	d23	52	73	67
2	36	16	b5	b2	b3	b5	d18	8.6	27	52	79	67
3	37	16	b5	b2	b3	b6	d20	7.3	33	56	107	72
4	34	14	b5	b1	b3	b7	d21	14	38	60	87	87
5	36	13	b3	b1	b3	b8	d27	15	41	57	72	71
6	34	13	b2	b1	b4	b7	d12	18	38	55	72	69
7	34	18	b4	b1	b5	b5	28	22	43	60	66	70
8	34	13	b5	b2	b6	b4	71	24	41	64	57	67
9	38	7	b4	b3	b8	b10	19	21	40	61	54	79
10	41	b4	b3	b3	b7	b18	a18	20	41	64	54	88
11	35	b4	b3	b2	b11	b22	a18	19	44	69	54	81
12	36	b4	b3	a2	b14	b20	a17	22	45	93	57	76
13	37	b4	b4	a2	b18	b19	a17	26	52	90	58	66
14	38	b4	7	a2	b22	b18	a16	31	52	83	63	59
15	51	b4	b6	a2	b23	b19	a16	30	59	54	65	64
16	132	b4	b5	a2	b25	20	a15	29	81	44	79	62
17	100	b5	b4	a1	b16	14	a15	26	66	47	106	59
18	179	b5	b3	b1	b10	13	a14	26	62	51	94	114
19	50	b5	b3	b1	b10	14	14	24	60	58	101	89
20	a30	b5	b3	b1	b10	44	14	25	58	56	76	67
21	a26	b5	b3	b1	b13	38	12	28	57	76	76	57
22	a24	b5	b3	b1	b16	15	11	34	61	69	70	49
23	a23	b4	b3	b2	b14	13	18	35	63	61	70	46
24	21	b4	b3	b3	b6	15	22	41	63	63	74	43
25	20	b5	b3	b4	b7	16	20	40	59	61	81	41
26	18	b4	b3	b5	b6	9.9	8.0	41	59	57	82	43
27	17	b5	b4	b5	b5	8.0	5.7	38	57	58	70	39
28	17	b4	4.5	b6	b4	9.3	4.7	39	58	57	68	38
29	20	b3	5.2	b4	-	54	6.5	42	50	64	68	37
30	20	b4	b4	b2	-----	6.9	5.2	32	60	69	70	25
31	19	-----	b3	b3	-----	2.9	-----	13	-----	68	66	-----
Total	1,271	219	119.7	71	275	553.2	522.1	800.9	1,527.3	1,929	2,269	1,892
Mean	41.0	7.3	3.86	2.3	9.8	17.8	17.4	25.8	50.9	62.2	73.2	63.1
Ac-ft	2,520	434	237	141	545	1,100	1,040	1,590	3,030	3,830	4,500	3,750

Calendar year 1960: Max 179 Min 1 Mean 29.6 Ac-ft 21,510  
Water year 1960-61: Max 179 Min 1 Mean 31.4 Ac-ft 22,720

Peak discharge (base, 120 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-16	9a.m.	2.68	183	4-8	1a.m.	2.87	205
10-18	1:15a.m.	3.26	292	8-17	9:15p.m.	2.65	181
3-20	8:30p.m.	2.43	145	9-18	3:15p.m.	2.59	180
3-29	10:15p.m.	2.55	158				

a No gage-height record.

b Stage-discharge relation affected by ice.

c Doubtful gage-height record.

9-3575. Animas River at Howardsville, Colo.

Location--Lat 37°50'00" (corrected), long 107°36'00", in sec.12, T.41 N., R.7 W., on right bank 1,000 ft downstream from bridge on State Highway 110, 0.4 mile southwest of Howardsville, and half a mile downstream from Cunningham Creek.

Drainage area--55.9 sq mi.

Records available--October 1935 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage--Water-stage recorder. Datum of gage is 9,616.98 ft above mean sea level, adjustment of 1912. Prior to Aug. 18, 1939, at datum 1.00 ft higher.

Average discharge--26 years, 106 cfs (76,740 acre-ft per year).

Extremes--Maximum discharge during year, 826 cfs May 26 (gage height, 3.30 ft); minimum daily, 12 cfs Mar. 8, 9.

1935-61: Maximum discharge, 1,980 cfs June 18, 1949, from rating curve extended above 950 cfs; maximum gage height, 5.24 ft Feb. 18, 1958 (backwater from snowslide); minimum daily discharge, 9 cfs Jan. 10, 1957.

Maximum flood known occurred Oct. 5, 1911.

Remarks--Records good except those for periods of ice effect, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 2-14)

0.7	13	1.6	100
.8	16	2.0	190
1.1	31	2.5	365
1.3	51	3.0	630

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	24	19	16	*17	15	19	*150	624	180	47	36
2	27	23	19	14	16	15	19	182	534	162	58	34
3	26	23	19	15	16	16	20	193	406	142	57	47
4	*26	23	19	16	16	15	20	185	353	140	58	45
5	25	23	18	17	16	16	*19	138	*401	132	60	*46
6	24	23	13	16	15	15	19	114	440	132	51	47
7	24	23	17	17	15	15	21	97	522	126	51	46
8	24	23	18	16	16	12	20	85	594	116	*56	49
9	25	22	18	16	16	12	19	90	600	106	50	86
10	27	22	18	17	16	13	18	136	*600	*93	47	88
11	29	22	17	16	16	*13	18	202	564	90	50	78
12	27	22	18	16	16	14	17	238	534	83	73	68
13	26	22	18	16	16	14	18	214	495	81	57	62
14	26	22	18	17	16	15	18	152	485	78	51	58
15	26	22	17	18	16	15	17	136	470	78	51	56
16	26	20	16	17	16	16	18	136	440	73	51	54
17	27	20	18	16	16	16	21	160	440	68	56	51
18	28	20	19	16	16	15	24	226	420	62	51	63
19	28	20	19	15	15	15	29	325	415	*62	47	74
20	27	20	19	16	15	17	34	333	410	64	49	86
21	27	20	19	15	15	16	33	*341	378	62	51	92
22	27	20	18	14	15	16	35	465	*349	54	45	108
23	27	20	18	14	15	15	37	490	333	49	40	120
24	28	20	17	16	15	15	33	470	317	47	39	114
25	27	20	16	15	16	17	29	558	289	45	41	100
26	27	20	17	15	16	16	27	630	264	50	39	98
27	28	19	17	15	15	17	30	624	232	49	37	98
28	28	*18	16	15	15	18	40	624	202	49	35	98
29	26	17	15	14	-	19	78	606	199	49	34	98
30	24	20	*15	17	-----	19	120	576	190	46	38	88
31	*23	-----	15	17	-----	17	-----	576	-----	45	37	-----
Total	81.7	63.3	54.0	49.0	43.9	47.9	87.0	9.452	12500	2613	1507	2188
Mean	26.4	21.1	17.4	15.8	15.7	15.5	29.0	305	417	84.3	48.6	72.9
Ac-ft	1,620	1,260	1,070	972	871	950	1,730	18,750	24,790	5,180	2,990	4,340

Calendar year 1960: Max 856 Min 13 Mean 99.5 Ac-ft 72,250  
Water year 1960-61: Max 630 Min 12 Mean 89.1 Ac-ft 64,520

Peak discharge (base, 700 cfs)--May 26 (6:30 p.m.) 826 cfs (3.30 ft); June 10 (8 p.m.) 819 cfs (3.27 ft).

\* Discharge measurement made on this day.

Note--Stage-discharge relation affected by ice Nov. 7, 16-21, 23, 24, 27-29, Dec. 1, 2, 5-7, 9-11, 13-17, 19-22, Dec. 24 to Jan. 23, Jan. 28 to Feb. 8, Feb. 10, 15, 18-25, Feb. 27 to Mar. 2, Mar. 4, Mar. 7 to Apr. 6, Apr. 9, 12, 15, 16 (no gage-height record Jan. 7-15, Mar. 12 to Apr. 4).

## SAN JUAN RIVER BASIN

9-3591. Lime Creek near Silverton, Colo.

Location--Lat 37°40'00", long 107°45'10", in sec.33, T.40 N., R.8 W., on left bank 3 miles downstream from Coal Creek, 4 miles upstream from mouth, and 11 miles southwest of Silverton.

Drainage area--33.9 sq mi.

Records available--October 1956 to September 1961 (discontinued).

Gage--Water-stage recorder. Altitude of gage is 9,050 ft (from topographic map).

Average discharge--5 years, 51.9 cfs (37,570 acre-ft per year).

Extremes--Maximum discharge during year, 644 cfs May 19 (gage height, 6.24 ft); minimum not determined.

1950-61: Maximum discharge, 1,400 cfs June 5, 1957 (gage height, 7.50 ft); maximum gage height, 8.04 ft Apr. 17, 1958 (ice jam); no flow for part of each day Oct. 26-28, 1956, caused by temporary pumpage for highway construction.

Remarks--Records good except those for periods of ice effect, which are poor. No diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 23 to Sept. 30)

3.4	2.5	3.9	18	5.0	182
3.5	4.0	4.2	44	5.5	310
3.7	9.5	4.5	83	6.0	520

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	8						253	284	30	7.1	11
2	3.7	6						284	250	27	1.6	10
3	3.6	6.0						280	186	24	1.6	14
4	*3.7	5.5						204	164	28	1.3	14
5	3.6	5.5						122	*173	21	1.1	*16
6	3.2	6.0						85	169	19	9.5	14
7	3.1							68	184	20	8.3	13
8	3.1							62	191	18	*1.1	12
9	4.2							88	186	16	8.9	42
10	6.8							169	171	*14	8.3	32
11	9.8	5					*7	255	164	12	8.0	21
12	7.4						7	*277	158	11	1.1	16
13	6.0						8	200	138	10	8.0	14
14	5.8						6	146	122	9.8	7.4	14
15	5.5						5	148	108	8.6	7.1	14
16	6.0		3	2.5	2	4		9	171	102	9.5	14
17	8.6							24	222	98	7.7	12
18	8.6							42	330	92	7.4	24
19	8.0							52	410	85	6.5	28
20	8.9							62	354	77	7.7	30
21	9.2	4						62	*358	68	8.0	30
22	9.2							71	370	61	6.5	48
23	9.5							86	310	*55	6.5	57
24	9.8							71	284	49	6.5	49
25	9.2							46	342	43	6.0	41
26	9.5							38	394	38	6.5	38
27	9.8							43	382	35	8.6	35
28	9.2	(*)3						82	362	32	8.0	33
29	8							152	334	31	8.0	32
30	7.5							208	310	35	8.0	28
31	*8								303		6.5	12
Total	211.7	137.0	93	77.5	56	124	113.1	787.7	354.9	384.8	316.0	756
Mean	6.83	4.57	3	2.5	2	4	37.7	254	118	12.4	10.2	25.2
Ac-ft	420	272	184	154	111	246	2,240	15,620	7,040	763	627	1,500

Calendar year 1960: Max 454 Min - Mean 48.7 Ac-ft 35,380

Water year 1960-61: Max 410 Min - Mean 40.3 Ac-ft 29,180

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-2	6p.m.	5.79	426	5-19	6p.m.	6.24	644
5-11	6:30p.m.	5.80	430	5-27	6:30p.m.	6.03	535

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 16, Oct. 29 to Nov. 2, Nov. 7 to Apr. 16 (no gage-height record Jan. 2 to Apr. 11).



9-3610. Hermosa Creek near Hermosa, Colo.

Location.--Lat 37°25'30", long 107°50'20", in NW¼ sec.3, T.36 N., R.9 W., on right bank 20 ft downstream from private bridge, 1 mile northwest of Hermosa, and 2 miles upstream from mouth.

Drainage area.--172 sq mi.

Records available.--November and December 1911 (gage heights and discharge measurements only), January 1912 to September 1914, October 1919 to September 1928, October 1939 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,705.88 ft above mean sea level, datum of 1929. Prior to September 1914, staff gage and April 1920 to September 1928, water-stage recorder (staff or chain gages for short periods), within half a mile at different datums.

Average discharge.--33 years, 144 cfs (104,300 acre-ft per year).

Extremes.--Maximum discharge during year, 712 cfs May 19 (gage height, 2.86 ft); minimum daily, 10 cfs Dec. 6. 1912-14, 1919-28, 1939-61: Maximum discharge, 2,980 cfs May 12, 1941 (gage height, 6.02 ft); maximum gage height, 8.50 ft Sept. 12, 1927, from floodmarks, site and datum then in use; minimum daily discharge, 4.0 cfs Dec. 9, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of a few acres above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 27 to May 24)

0.5	13	1.7	210
.8	33	2.0	330
1.0	52	3.0	880
1.3	98		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	24	20	13	*11	16	40	*515	480	56	40	*42
2	17	23	18	12	11	17	46	560	*435	52	64	38
3	17	23	19	12	12	18	112	575	360	53	57	41
4	*17	23	17	12	12	17	237	490	290	56	59	45
5	16	23	13	12	11	18	280	340	272	49	51	50
6	15	23	10	13	11	17	186	244	260	*46	49	48
7	15	31	15	13	11	16	180	207	256	50	*40	43
8	15	31	15	13	11	16	142	177	252	52	37	40
9	20	25	16	13	12	*17	122	192	252	47	35	70
10	38	22	14	13	12	18	*136	256	244	43	32	63
11	51	21	14	13	12	20	122	390	234	41	33	51
12	34	21	14	12	13	21	128	510	219	39	41	46
13	27	21	14	12	13	23	171	470	195	38	35	41
14	24	21	14	12	13	31	142	320	180	36	36	39
15	25	20	14	12	13	40	112	280	174	35	35	40
16	31	20	13	12	13	49	128	310	*156	34	47	42
17	36	20	12	12	14	48	198	385	142	35	80	38
18	39	20	13	12	13	49	256	490	130	34	80	46
19	33	20	13	12	13	44	290	*580	117	33	80	56
20	34	22	13	12	*13	39	385	664	110	32	58	53
21	33	22	13	12	13	39	*380	634	103	38	66	52
22	32	20	12	12	14	44	385	622	93	33	49	57
23	34	20	13	12	15	58	425	592	85	31	47	64
24	33	20	13	13	14	69	365	570	77	30	51	63
25	31	20	13	13	16	57	234	530	72	30	48	54
26	30	20	13	12	13	49	189	535	66	31	47	50
27	30	21	13	13	17	46	171	555	63	34	41	47
28	30	*20	14	11	17	45	222	560	62	34	38	44
29	27	20	13	11	-	42	325	550	57	41	38	43
30	23	20	*13	11	-----	40	420	510	56	41	44	40
31	*23	-----	14	11	-----	38	-----	500	-----	36	41	-----
Total	846	657	435	378	368	1,061	6,529	14,113	5,492	1,240	1,499	1,446
Mean	27.3	21.9	14.0	12.2	13.1	34.2	218	455	183	40.0	48.4	48.2
Ac-ft	1,680	1,300	863	750	730	2,100	12,950	27,990	10,890	2,460	2,970	2,870

Calendar year 1960: Max 978 Min 10 Mean 131 Ac-ft 94,810  
Water year 1960-61: Max 664 Min 10 Mean 93.3 Ac-ft 67,550

Peak discharge (base, 800 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15-25, Nov. 28 to Dec. 1, Dec. 3 to Feb. 25 (no gage-height record Dec. 30 to Feb. 20), Feb. 27 to Mar. 2, Mar. 4-10.

## SAN JUAN RIVER BASIN

9-3612. Falls Creek near Durango, Colo.

Location.--Lat 37°22'00", long 107°51'30", in SW $\frac{1}{4}$  sec.21, T.36 N., R.9 W., on right bank 1.2 miles upstream from mouth and 6.5 miles north of Durango.

Drainage area.--7.18 sq mi.

Records available.--October 1959 to September 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,080 ft (from topographic map).

Extremes.--Maximum discharge during year, 14 cfs May 2 (gage height, 3.76 ft); minimum daily, 0.1 cfs for many days in January and February.

1959-61: Maximum discharge, 23 cfs May 13, 1960 (gage height, 3.95 ft); minimum daily, that of January and February 1961.

Remarks.--Records good. Small diversions above station for irrigation of meadows.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)

3.1	0.1	3.5	4.6
3.2	.7	3.6	7.1
3.3	1.6	3.8	15

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.4	0.3	0.2	0.1	* 0.3	0.9	* 1.1	* 4.0	1.1	0.5	* 0.3
2	.3	.4	.3	.2	.1	.2	1.2	1.3	3.8	1.1	.6	.3
3	.3	.4	.3	.2	.1	.2	1.5	1.3	3.6	1.2	.5	.3
4	.3	.4	.3	.2	.1	.2	1.9	1.2	3.3	1.2	.6	.4
5	.3	.4	.2	.2	.1	.2	3.2	1.0	2.9	1.1	.5	.4
6	.3	.4	.2	.1	.1	.2	2.4	8.5	2.7	* 1.0	.5	.3
7	.3	.5	.2	.1	.1	.2	3.3	7.1	2.9	.9	* .5	.3
8	.3	.4	.2	.1	.1	.2	2.6	6.4	2.6	.9	.4	.3
9	.4	.3	.2	.1	.1	.2	2.2	5.8	2.4	.9	.4	.5
10	.4	.3	.2	.1	.1	.3	* 2.2	6.6	2.3	.9	.3	.5
11	.5	.3	.2	.1	.1	.3	1.9	8.8	2.2	.8	.3	.4
12	.4	.3	.2	.1	.1	.4	2.4	10	2.0	.8	.3	.3
13	.3	.3	.2	.1	.1	.5	3.6	10	2.0	.8	.3	.3
14	.3	.3	.2	.1	.2	.8	3.5	8.5	1.9	.7	.3	.3
15	.5	.3	* .2	.1	.2	1.0	3.0	7.1	1.9	.7	.3	.3
16	.5	.3	.2	.1	.2	.6	3.3	7.1	* 1.9	.7	.5	.3
17	.5	.3	.2	.1	.2	.6	4.8	7.4	1.7	.6	.6	.3
18	.6	.3	.2	.1	.2	.5	6.8	7.8	1.6	.6	.5	.6
19	.4	.3	.2	.1	.1	.4	7.8	8.5	1.6	.6	.4	.6
20	.4	.3	.2	.1	.1	.6	8.8	8.8	1.5	.6	.3	.5
21	.3	.3	.2	.2	.1	.6	8.5	8.8	1.5	.6	.3	.4
22	.3	.3	.2	.2	.1	.5	8.5	8.1	1.4	.6	.3	.4
23	.3	.3	.2	.1	.1	.5	8.5	7.8	1.6	.6	.3	.4
24	.3	.3	.2	.1	.1	.6	7.8	7.1	1.5	.6	.3	.4
25	.3	.2	.2	.1	.1	.6	6.1	6.8	1.4	.5	.3	.4
26	.3	.2	.2	.1	.1	.6	4.8	6.1	1.2	.5	.3	.4
27	.3	.3	.2	.1	.1	.6	4.6	5.8	1.2	.5	.3	.4
28	* .3	* .2	.2	.1	.1	.6	5.4	5.6	1.2	.5	.3	.4
29	.3	.2	.2	.1	-	.6	7.1	5.1	1.2	.5	.3	.4
30	.3	.3	* .2	* .2	-----	.6	9.5	4.6	1.1	.5	.3	.4
31	.3	-----	.2	.1	-----	.6	-----	4.3	-----	.5	.3	-----
Total	11.3	9.5	6.6	3.9	3.3	14.3	138.1	247.5	62.1	23.1	11.9	11.5
Mean	0.36	0.32	0.21	0.13	0.12	0.46	4.60	7.98	2.07	0.75	0.38	0.38
Ac-ft	22	19	13	7.7	6.5	28	274	491	123	46	24	25

Calendar year 1960: Max 22 Min 0.2 Mean 2.81 Ac-ft 2,040

Water year 1960-61: Max 13 Min 0.1 Mean 1.49 Ac-ft 1,080

Peak discharge (base, 25 cfs).--No peak above base.

\* Discharge measurement made on this day.

9-3614. Junction Creek near Durango, Colo.

Location.--Lat 37°20'05", long 107°54'05", in sec.36, T.36 N., R.10 W., on left bank  $4\frac{1}{2}$  miles upstream from mouth and  $4\frac{1}{2}$  miles northwest of Durango.

Drainage area.--26.3 sq mi.

Records available.--October 1959 to September 1961.

Gage.--Water-stage recorder. Datum of gage is 7,045.65 ft above mean sea level (Bureau of Reclamation bench mark).

Extremes.--Maximum discharge during year, 133 cfs May 1 (gage height, 3.80 ft); minimum not determined.

1959-61: Maximum discharge, about 230 cfs May 13, 1960; maximum gage height, 3.94 ft May 11, 1960; minimum discharge not determined.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No regulation or diversion above station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 3-7)

2.2	0.7	3.0	26
2.3	1.7	3.3	50
2.5	5.5	3.6	89
2.7	11	3.8	128

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9	4.9	2.4			2.4	11	*103	*64	8.0	2.6	*3.3
2	1.9	4.7	2.4			b2.6	16	110	58	7.5	3.8	3.1
3	1.7	4.5	2.6			b2.8	37	92	49	7.2	3.4	3.9
4	1.7	4.3	2.8			*b2.6	*78	71	43	8.3	3.4	3.9
5	1.6	4.1	b2.5			b2.0	86	54	41	7.0	3.6	4.9
6	1.6	3.9	b2.0			b1.8	56	45	39	*6.5	3.2	4.9
7	1.6	6.8	b2.6			b1.7	56	39	38	6.5	*3.0	4.7
8	1.6	7.2	3.1			b1.7	46	35	36	7.0	2.6	4.3
9	3.1	6.2	3.1			b2.0	38	35	37	6.2	2.1	1.5
10	3.3	*6.5	b2.7			b2.2	*36	45	39	5.8	2.1	1.2
11	3.3	6.0				2.8	33	64	38	5.3	1.9	8.6
12	3.1	5.8				3.1	34	76	35	5.1	2.2	7.0
13	4.5	5.5				3.5	39	65	30	4.7	2.2	6.0
14	4.9	5.3				4.1	36	47	27	4.5	2.2	5.3
15	5.8	5.1	(*)	2	2.5	b8	33	44	25	4.3	2.4	4.9
16	7.8	b4.0				b12	35	48	*21	3.9	5.3	4.7
17	9.5	4.5				16	46	59	20	3.7	11	4.1
18	11	b3.4				16	53	71	20	3.7	11	8.9
19	8.9	3.7				12	60	*84	18	3.3	11	8.6
20	7.8	3.5			(*)	11	69	88	18	3.3	8.4	8.0
21	8.6	3.3	2.5			11	*78	83	17	3.5	8.8	8.0
22	9.5	3.3				13	83	83	16	3.0	6.8	*7.2
23	10	b2.8				20	84	84	14	2.6	4.6	7.2
24	11	b2.8				22	77	80	12	2.4	4.8	7.5
25	9.5	3.0				19	58	70	12	2.2	4.4	7.0
26	9.2	2.8				16	47	66	11	2.2	4.2	6.8
27	8.9	3.0				14	47	69	10	2.2	3.8	6.0
28	*8.6	*b1.9				b12	58	68	9.2	4.7	3.4	5.3
29	7.2	b2.3				11	77	66	8.3	4.3	3.4	5.1
30	6.0	2.4	(*)	(*)	-----	b9.5	94	65	8.3	2.4	3.6	4.7
31	5.1	-----			-----	b10	-----	66	-----	1.9	3.6	-----
Total	180.2	127.5	78.7	62	70.0	267.8	1601	2075	813.8	143.2	138.8	190.9
Mean	5.81	4.25	2.54	2	2.5	8.64	53.4	66.9	27.1	4.62	4.48	6.36
Ac-ft	357	253	156	123	139	531	3,180	4,120	1,610	284	275	379

Calendar year 1960: Max 200 Min - Mean 22.2 Ac-ft 16,110

Water year 1960-61: Max 110 Min - Mean 15.8 Ac-ft 11,410

Peak discharge (base, 120 cfs).--May 1 (11 p.m.) 133 cfs (3.80 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Dec. 11 to Mar. 1 (stage-discharge relation affected by ice during most of period), Aug. 1-7, 18-31.

## SAN JUAN RIVER BASIN

9-3615. Animas River at Durango, Colo.

Location.--Lat 37°16'45", long 107°52'25", in sec.20, T.35 N., R.9 W., on left bank at Western Colorado Power Co.'s plant at Durango, three-quarters of a mile upstream from Lightner Creek.

Drainage area.--692 sq mi.

Records available.---June to December 1895, April 1896 to December 1898, April 1899 to December 1900, March to May 1901, April to November 1902, March to April 1903 (gage heights only, erroneously stated as discredited in WSP 1563), May to October 1903, July 1904 to December 1905, January to December 1910 (gage heights only), January to September 1911, January 1912 to September 1961. Monthly or yearly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 6,501.57 ft above mean sea level, datum of 1929. Prior to Dec. 31, 1905, staff gages at several sites three-quarters of a mile downstream at various datums. Jan. 1, 1910, to Aug. 12, 1911, staff gage at present site at different datum. Jan. 1, 1912, to Mar. 2, 1921, staff gage or water-stage recorder at present site and datum.

Average discharge.--56 years (1896-1900, 1904-5, 1910-61), 863 cfs (624,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,250 cfs May 28 (gage height, 5.64 ft); minimum daily, 148 cfs Mar. 2, 8. 1895-1905, 1910-61: Maximum discharge, 25,000 cfs Oct. 5, 1911 (gage height, 11 ft, present site and datum), from rating curve extended above 13,000 cfs; minimum daily, 94 cfs Mar. 2, 1913. Maximum flood known, that of Oct. 5, 1911.

Remarks.--Records good. Diversions for irrigation of about 4,000 acres above station. Natural regulation by many lakes and regulation for power above station.

Rating table, water year 1960-61 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 5-8)

1.9	145	3.5	1,170
2.2	245	4.0	1,740
2.5	395	5.0	3,120
3.0	740	6.0	4,900

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	233	*280	237	199	175	154	275	*1,810	3,550	876	*310	*428
2	233	275	225	196	175	148	295	2,170	3,390	835	412	395
3	233	270	237	184	172	154	350	2,340	2,720	788	668	400
4	217	270	250	202	172	154	543	2,250	2,060	764	676	444
5	217	275	225	205	169	154	724	1,620	2,110	756	615	444
6	217	260	169	209	160	151	*608	1,240	2,180	676	557	450
7	217	270	221	213	169	154	600	1,040	2,260	684	476	439
8	221	290	225	217	169	148	571	900	2,550	660	450	428
9	221	270	237	213	175	151	496	868	2,760	630	422	489
10	285	260	225	217	175	160	489	1,060	2,680	600	375	796
11	340	245	213	217	175	181	470	1,500	2,660	564	355	692
12	345	245	205	209	169	190	444	2,180	2,520	522	417	592
13	305	241	225	*209	169	190	522	2,120	2,380	502	476	522
14	290	237	217	209	172	202	508	1,450	*2,130	*482	422	476
15	300	237	*202	205	172	*217	463	1,240	2,130	450	400	456
16	320	229	193	199	175	245	463	1,210	1,940	422	428	456
17	355	233	190	209	173	255	543	*1,460	1,900	400	550	428
18	380	241	202	205	178	260	748	1,890	1,940	375	*630	434
19	350	241	225	205	169	260	852	2,590	1,790	355	608	622
20	*325	245	233	202	160	237	*1,020	3,100	1,840	345	529	638
21	320	233	221	205	172	245	1,110	2,610	1,760	360	496	652
22	315	*237	*225	199	172	245	1,050	3,240	1,630	345	450	*652
23	320	241	229	193	*169	275	1,160	*3,200	1,390	310	412	732
24	320	237	229	202	163	310	1,180	3,040	1,300	300	406	748
25	320	237	229	190	154	320	945	3,150	1,250	295	412	676
26	325	237	221	181	154	300	804	3,550	1,160	295	434	630
27	320	241	221	184	154	280	732	3,690	1,100	300	400	600
28	310	221	233	184	151	285	796	3,860	981	290	365	578
29	310	217	229	181	-	290	1,060	*3,660	*918	285	360	550
30	295	225	221	169	-----	285	1,440	3,550	918	305	370	529
31	285	-----	213	181	-----	275	-----	3,550	-----	305	444	-----
Total	9,044	7,440	6,827	6,193	4,717	6,875	21,261	71,133	59,897	15,077	14,325	16,376
Mean	292	248	220	200	168	222	709	2,295	1,997	486	462	546
Ac-ft	17,940	14,760	13,540	12,280	9,360	13,640	42,170	141,100	118,800	29,900	28,410	32,480

Calendar year 1960: Max 4,350 Min 146 Mean 753 Ac-ft 546,700  
Water year 1960-61: Max 3,860 Min 148 Mean 655 Ac-ft 474,400

Peak discharge (base, 4,000 cfs)--May 28 (7 a.m.) 4,250 cfs (5.64 ft).

\* Discharge measurement made on this day.



9-3629. Florida River near Hermosa, Colo.

Location.--Lat 37°22'40", long 107°39'40", in NW $\frac{1}{4}$  sec.20, T.36 N., R.7 W., on left bank 2 miles upstream from True Creek and 10 miles southeast of Hermosa.

Drainage area.--69.4 sq mi.

Records available.--October 1955 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 7,940 ft (by barometer).

Average discharge.--6 years, 89.8 cfs (65,010 acre-ft per year).

Extremes.--Maximum discharge during year, 790 cfs May 19 (gage height, 6.61 ft); minimum daily, 7.5 Feb. 7, 8.

1955-61: Maximum discharge, 1,880 cfs July 26, 1957 (gage height, 8.67 ft); minimum daily, 4.0 cfs Jan. 11, 31, 1957.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions above station for irrigation of 150 acres.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 23 to June 5, Aug. 2 to Sept. 30)

3.6	10	5.0	186
3.7	13	5.5	320
3.9	26	6.5	765
4.4	76		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	25	12	9.5	8.5	8	15	264	536	51	26	58
2	12	24	12	8.5	8.5	8.5	14	352	*459	51	73	58
3	12	25	12	8.5	8.5	9	22	405	332	50	136	63
4	12	24	12	9	8	8.5	35	356	276	50	76	71
5	12	24	11	9	8	9	42	235	276	43	90	74
6	12	24	11	9	8	8.5	36	179	273	41	65	72
7	12	28	12	9	7.5	8.5	40	148	279	*40	51	*65
8	12	25	12	9	7.5	8	36	122	285	50	40	62
9	14	22	12	9	8	8.5	32	120	288	41	36	115
10	18	21	12	9	8	9	*34	166	279	38	33	171
11	22	20	12	9	8	9	33	250	279	33	30	134
12	19	20	12	8.5	8	9	36	*364	264	32	35	115
13	18	20	11	8.5	8	9.5	41	340	232	30	32	106
14	18	20	*11	8.5	8	10	38	228	204	28	43	98
15	19	18	11	8.5	8	12	36	223	*206	26	44	93
16	25	17	11	8.5	8	13	40	238	193	25	56	101
17	27	17	10	8.5	8	12	53	313	175	24	140	90
18	28	16	11	8.5	8	13	69	490	162	23	150	111
19	24	17	11	8.5	8	12	76	626	148	22	113	150
20	22	16	11	8.5	8	12	84	639	138	22	83	130
21	24	16	10	8.5	*8	12	90	590	124	27	77	*120
22	25	16	10	8.5	8.5	13	98	612	113	23	58	110
23	26	16	10	*9	8.5	17	115	536	96	21	51	111
24	28	16	11	9	8	*20	*115	513	86	20	53	108
25	27	15	11	9	8	18	93	576	79	20	55	95
26	28	14	10	9	9	15	80	*594	72	19	53	89
27	29	15	9.5	8.5	9	14	77	554	68	21	43	82
28	*30	14	10	9	8.5	15	104	567	62	19	38	76
29	28	15	9.5	8.5	-	17	154	544	56	22	12	71
30	26	*14	9	8.5	-----	15	215	522	54	32	66	68
31	25	-----	9.5	8.5	-----	14	-----	544	-----	*27	49	-----
Total	646	574	338.5	271.0	228.0	367.0	1953	12210	6094	971	1907	2867
Mean	20.8	19.1	10.9	8.74	8.14	11.8	65.1	394	203	31.3	61.5	95.6
Ac-ft	1,280	1,140	671	538	452	728	3,870	24,220	12,090	1,930	3,780	5,690

Calendar year 1960: Max 662 Min 9 Mean 90.1 Ac-ft 65,380

Water year 1960-61: Max 639 Min 7.5 Mean 77.9 Ac-ft 56,390

Peak discharge (base, 500 cfs).--May 19 (9 p.m.) 790 cfs (6.61 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16 to Dec. 2, Dec. 4 to Mar. 14, Mar. 26-28, 31, Apr. 2, 6, 9, 12, 15, 16.

## SAN JUAN RIVER BASIN

9-3631. Salt Creek near Oxford, Colo.

Note.--Records for the 1961 water year have been withheld pending better definition of the stage-discharge relation for high stage. They will be published in a subsequent annual report.

9-3632. Florida River at Bondad, Colo.

Location.--Lat 37°03'20", long 107°52'10", in S $\frac{1}{2}$  sec.31, T.33 N., R.9 W., on left bank 0.6 mile upstream from mouth, 0.7 mile southeast of Bondad, and 15 miles south of Durango.

Drainage area.--221 sq mi.

Records available.--October 1956 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 6,000 ft (from topographic map). Prior to Sept. 11, 1958, at site 300 ft upstream at datum 2.39 ft higher.

Average discharge.--5 years, 86.3 cfs (62,480 acre-ft per year).

Extremes.--Maximum discharge during year, 446 cfs May 22 (gage height, 4.22 ft); minimum daily, 9 cfs Dec. 6.  
1956-61: Maximum discharge not determined, occurred July 26, 1957; minimum daily, 4.6 cfs July 24, 1959.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 14,000 acres above station.

Rating table, water year 1960-61, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	8.0	3.0	76
2.5	24	3.5	190
2.7	38	4.5	520

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	*20	10	12	10	13	54	*262	314	28	30	26
2	14	16	10	12	10	*14	53	298	*304	31	28	25
3	13	12	12	11	11	16	60	317	238	34	62	26
4	12	11	12	12	11	19	92	320	153	34	*55	31
5	*13	15	11	12	10	20	121	253	134	36	38	31
6	14	14	9	12	10	20	*100	202	123	*33	38	30
7	15	17	12	12	10	18	123	160	110	36	40	*29
8	16	18	13	13	11	17	184	123	114	46	34	25
9	19	16	12	13	11	19	114	90	121	46	29	32
10	28	14	12	13	11	24	106	60	116	45	25	85
11	28	13	13	13	12	44	90	89	106	29	24	76
12	30	12	13	12	11	50	87	169	100	25	28	53
13	32	12	13	12	12	52	90	223	85	27	27	42
14	29	11	13	12	11	55	89	143	62	25	25	26
15	32	12	13	12	12	60	76	98	62	25	28	23
16	71	11	12	11	12	63	78	89	*54	27	34	26
17	76	11	12	11	13	48	85	104	49	27	54	23
18	127	11	12	11	12	49	112	190	43	22	87	64
19	54	12	13	11	12	42	127	307	38	19	62	132
20	32	12	13	11	12	44	146	366	32	20	45	129
21	25	11	13	11	12	50	155	304	28	19	38	104
22	22	11	12	11	12	36	155	359	27	20	36	95
23	20	11	13	12	11	38	163	320	26	21	34	90
24	19	12	13	12	11	47	*181	317	27	19	36	85
25	19	12	14	13	12	53	153	317	28	17	36	80
26	18	11	13	11	13	44	132	*370	28	14	37	70
27	18	12	14	12	12	39	118	348	27	12	35	60
28	18	11	*15	12	12	42	127	338	28	14	31	50
29	18	10	14	10	-	59	155	338	29	16	29	44
30	18	*11	13	*10	-----	96	208	307	30	25	29	40
31	19	-----	13	10	-----	70	-----	307	-----	32	28	-----
Total	883	382	387	362	319	1,261	3,534	7,488	2,636	824	1,162	1,652
Mean	28.5	12.7	12.5	11.7	11.4	40.7	118	242	87.9	26.6	37.5	55.1
Ac-ft	1,750	758	768	718	633	2,500	7,010	14,890	5,230	1,630	2,300	3,280

Calendar year 1960: Max 436

Min 9

Mean 80.3

Ac-ft 58,270

Water year 1960-61: Max 370

Min 9

Mean 57.2

Ac-ft 41,430

Peak discharge (base, 600 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-26, 28, 29, Dec. 3 to Feb. 28, Mar. 5, 7, 8. No gage-height record Sept. 22-30.

9-3635. Animas River near Cedar Hill, N. Mex.

Location--Lat 37°02'15", long 107°52'25", in sec.7, T.32 N., R.9 W., on right bank three-quarters of a mile downstream from Florida River, 2.5 miles upstream from Colorado-New Mexico State line, and 8.5 miles north of Cedar Hill.

Drainage area--1,090 sq mi, approximately.

Records available--October 1933 to September 1961. Monthly discharge only for October and November 1933, published in WSP 1313.

Gage--water-stage recorder. Altitude of gage is 5,960 ft (from topographic map). Prior to Sept. 14, 1937, at datum between 1.52 and 1.36 ft higher. Sept. 15, 1937, to Sept. 30, 1946, at datum 1.36 ft higher.

Average discharge--28 years, 911 cfs (659,500 acre-ft per year).

Extremes--Maximum discharge during year, 4,950 cfs May 28 (gage height, 7.40 ft); minimum daily, 166 cfs Mar. 1, 2.

1933-61: Maximum discharge, 13,100 cfs June 19, 1949 (gage height, 11.45 ft); minimum daily, 90 cfs Jan. 21, 1935.  
Maximum flood known occurred Oct. 5 or 6, 1911.

Remarks--Records good except those for periods of ice effect, doubtful or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 20,000 acres above station. During water years 1944-49, Twin Rocks Canal diverted above station for irrigation below.

Cooperation--Records furnished by New Mexico district.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 31

July 31 to Sept. 30

2.9	151	5.0	1,300	4.0	305
3.4	290	6.0	2,500	4.3	480
3.9	510	7.0	4,150	4.6	720
4.4	800	7.2	4,540	4.9	1,000

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	246	286	258	b230	183	166	415	2,200	4,080	940	d320	441
2	240	280	249	b220	189	166	415	2,560	3,880	905	482	415
3	240	269	262	b210	183	176	475	2,890	3,260	863	837	403
4	237	272	294	b220	183	186	752	2,860	2,470	842	846	460
5	231	276	262	b230	183	194	1,040	2,170	2,360	849	747	467
6	228	262	b200	b230	178	186	884	1,650	2,460	770	684	474
7	228	298	b225	b230	183	186	912	1,380	2,500	770	582	460
8	225	306	b240	b240	183	183	996	1,180	2,770	764	536	428
9	231	290	b260	b240	186	178	764	1,040	2,970	746	501	530
10	280	272	b260	b240	191	199	722	1,170	2,970	710	441	882
11	342	d265	b240	b240	194	234	680	1,600	2,920	638	397	837
12	374	d265	b230	b230	199	266	644	2,350	2,830	584	422	684
13	346	d265	b245	b230	194	269	698	2,470	2,620	550	558	598
14	326	d265	b260	b230	212	294	722	1,870	2,320	520	428	515
15	350	d265	b240	b230	212	326	650	1,500	2,300	480	480	494
16	456	d262	b225	b235	212	354	614	1,430	2,090	446	598	501
17	520	d252	b220	b235	217	342	680	1,620	2,010	438	614	454
18	628	272	b220	b230	199	350	905	2,060	2,010	392	729	675
19	446	276	b230	b230	191	350	1,070	3,010	1,880	374	693	801
20	379	280	b240	b230	178	330	1,270	3,690	1,880	370	590	810
21	362	266	b240	b230	191	346	1,400	3,210	1,870	384	536	801
22	346	266	b240	b220	199	322	1,350	3,780	1,690	397	522	774
23	334	266	b240	b220	207	362	1,470	3,830	1,550	358	454	846
24	334	266	b240	b225	181	406	1,520	3,690	1,370	326	434	910
25	330	255	b240	b215	178	433	1,300	3,790	1,320	318	454	819
26	330	262	b240	a210	173	388	1,040	4,150	1,240	302	460	756
27	318	272	b250	a200	173	346	926	4,400	1,150	290	434	693
28	318	258	b240	a200	169	366	972	4,460	1,070	286	391	666
29	318	252	b240	a195	-	428	1,300	4,230	964	280	385	675
30	306	249	b230	a185	-----	460	1,760	4,080	948	314	385	630
31	286	-----	b230	189	-----	433	-----	3,860	-----	340	441	-----
Total	10,135	8,090	7,490	6,899	5,321	9,225	28,346	84,190	65,752	16,546	16,381	18,899
Mean	327	270	242	223	190	298	945	2,716	2,192	534	528	630
Ac-ft	20,100	16,050	14,860	13,680	10,550	18,300	56,220	167,000	130,400	32,820	32,490	37,490

Calendar year 1960: Max 5,240 Min 150 Mean 909 Ac-ft 660,000  
Water year 1960-61: Max 4,460 Min 166 Mean 760 Ac-ft 550,000

Peak discharge (base, 4,000 cfs)--May 28 (10:30 a.m.) 4,950 cfs (7.40 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

## SAN JUAN RIVER BASIN

9-3655. La Plata River at Hesperus, Colo.

Location (revised).--Lat 37°17'20", long 108°02'05", in sec.14, T.35 N., R.11 W., on right bank at Hesperus 700 ft downstream from U. S. Highway 160.

Drainage area.--37 sq mi, approximately.

Records available.--June to August 1904, May 1905 to September 1906, August to November 1910, June 1917 to September 1961. Monthly discharge only for some periods, published in WSP 1313. Records for Nov. 11 to Dec. 31, 1910, published in WSP 289, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 8,104.71 ft above mean sea level, datum of 1929. Prior to May 1, 1920, staff gage and May 1, 1920, to May 24, 1927, water-stage recorder, at several sites about 600 ft downstream at different datums. May 25, 1927, to Sept. 30, 1938, water-stage recorder at site 60 ft downstream and Oct. 1, 1938, to Sept. 30, 1941, at present site at datum 1.00 ft higher.

Average discharge.--45 years (1905-6, 1917-61), 46.3 cfs (33,520 acre-ft per year).

Extremes.--Maximum discharge during year, 347 cfs May 2 (gage height, 2.36 ft); minimum not determined.

1904-6, 1910, 1917-61: Maximum discharge, 1,880 cfs Sept. 22, 1941 (gage height, 4.30 ft, present datum), from rating curve extended above 620 cfs on basis of slope-area measurement of peak flow; minimum not determined.

Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. One diversion above station for irrigation of about 2,000 acres along Cherry Creek below station.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	2.0	1.6	58
1.0	5.0	1.8	114
1.2	14	2.0	188
1.4	31	2.3	340

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.7	17					25	265	143	23	9.5	16
2	4.7	18				(*)	26	*280	*125	21	*10	15
3	4.7	*18			(*)		32	270	108	22	10	15
4	*4.7	18					44	196	89	23	12	16
5	4.7	17					60	125	86	20	14	*15
6	4.7	16				5.5	73	98	83	18	15	15
7	4.4	18					73	89	78	19	15	16
8	4.4	17					60	*76	*68	26	15	16
9	6.2	15					58	70	66	24	14	42
10	7.0	14		(*)			*58	105	70	21	13	45
11	6.6	14					58	*169	68	20	12	35
12	5.8	12					63	217	58	20	12	30
13	5.4	12	(*)			8	73	192	48	*18	11	27
14	5.4	12					63	128	41	18	*10	24
15	7.8	12					60	111	38	16	10	22
16	10	12	7.5	7	6		66	*121	*28	14	15	22
17	11	*12					95	161	25	14	35	20
18	10	12				14	146	226	23	14	*39	27
19	9.5	12					158	*270	*50	12	25	*31
20	*9.5	12					165	270	78	12	21	29
21	9.5	11				17	188	240	70	12	20	26
22	9.0	11				17	188	265	66	11	18	25
23	9.0	10				17	205	250	56	10	17	26
24	9.0	10				*18	184	240	50	*10	17	26
25	9.0	10				18	118	188	48	9.5	18	25
26	9.5	9				18	83	*173	44	9.5	18	23
27	9.5	9				22	73	184	40	9.5	18	22
28	11	8				22	*98	177	36	9.0	17	21
29	13	9				22	177	158	*34	9.0	16	19
30	14	10				22	235	143	*27	9.0	18	19
31	15	-----				24	-----	143	-----	9.0	16	-----
Total	248.7	38.7	232.5	21.7	16.8	382.0	300.5	560.0	184.4	482.5	510.5	711
Mean	8.02	12.9	7.5	7	6	12.3	100	181	61.5	15.6	16.5	23.7
Ac-ft	493	768	461	430	333	758	5,960	11,110	3,660	957	1,010	1,410

Calendar year 1960: Max 332 Min - Mean 48.0 Ac-ft 34,850  
 Water year 1960-61: Max 280 Min - Mean 37.8 Ac-ft 27,350

Peak discharge (base, 230 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-2	10:30p.m.	2.36	347	5-19	10:30p.m.	2.24	322
5-12	1a.m.	2.08	240				

\* Discharge measurement made on this day.

Note.--No gage-height record Nov. 24 to Mar. 23 (stage-discharge relation affected by ice during most of period).



## 9-3665. La Plata River at Colorado-New Mexico State line

Location.--Lat 37°00'00", long 108°11'20", in sec.10, T.32 N., R.13 W., on right bank at Colorado-New Mexico State line, 3 miles north of Fendleton, N. Mex.

Drainage area.--331 sq mi.

Records available.--January 1920 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 5,975.15 ft above mean sea level, datum of 1929. Prior to Apr. 30, 1920, staff gage at site 2 miles upstream at different datum. May 1 to June 18, 1920, staff gage and June 19, 1920, to Sept. 30, 1924, water-stage recorder, at present site at datum 1.26 ft higher. Oct. 1, 1924, to Mar. 16, 1934, water-stage recorder at present site at datum 0.26 ft higher.

Average discharge.--41 years, 34.8 cfs (25,190 acre-ft per year).

Extremes.--Maximum discharge during year, 622 cfs Aug. 16 (gage height, 3.90 ft); no flow July 3-6.  
1920-61: Maximum discharge, 4,750 cfs Aug. 24, 1927 (gage height, 11.36 ft, present datum), from rating curve extended above 750 cfs on basis of slope-area measurement of peak flow; no flow at times for many years.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 15,000 acres, mostly above station.

Rating tables, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Aug. 3				Aug. 4 to Sept. 30			
0.2	0	1.0	19	0.5	1.0	1.5	55
.3	.4	1.3	37	.6	2.6	1.9	108
.4	1.4	1.6	66	.7	4.6		
.5	3.0	2.0	125	.9	12		
.7	8.0			1.1	22		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	3.5	4.0		6.5	7.0	2.6	113	89	3.2	10	2.8
2	.9	3.2	4.0		7	*7.0	3.5	110	*89	1.3	*76	2.6
3	1.1	*3.2	4.0		*7	8.3	6.4	115	70	0	22	2.8
4	.6	3.2	4		6.5	9.2	8.5	76	51	0	3.2	3.0
5	*.4	3.5	4		6	9.5	122	50	48	0	3.0	*3.0
6	.3	3.2	4.5		5.5	9.5	58	43	51	0	2.6	2.8
7	.4	6.0	5.5		5	9.5	70	68	57	2.5	2.4	2.6
8	.4	4.2	7		6	8.6	12.5	*62	54	4.8	2.3	2.6
9	1.4	4.0	6		7	8.3	8.5	49	15	1.1	2.6	6.9
10	4.8	3.8	5	(*)	8	9.5	*81	50	2.5	.6	2.6	1.2
11	2.2	3.8	6		9	10	65	66	1.6	*4.8	2.4	7.0
12	2.0	3.8	6.5		8.5	11	59	97	1.0	4.5	2.4	6.0
13	2.0	3.8	*7.2		9	12	74	89	1.6	4.5	2.4	5.3
14	2.0	3.8	4.5		9	13	68	74	2.2	4.2	*2.4	5.3
15	6.0	3.8	4.5		9.2	20	52	54	11	3.5	2.4	4.9
16	5.2	4.8	4.5	6	8.3	31	43	56	5.8	3.2	9.3	4.9
17	6.2	*5.0	5		10	29	47	72	3.0	3.0	7.1	4.9
18	9.8	4.5	6		8.9	33	91	92	3.0	2.7	*4.6	6.3
19	6.0	4.5	6		7.5	28	106	*94	5.5	2.5	8.4	*10
20	*4.8	3.2	6		7.0	16	113	91	38	2.5	4.4	8.0
21	4.2	3.5	4.5		7.0	13	116	62	*50	2.5	4.4	6.6
22	4.0	3.8	5		7.2	12	116	85	46	2.5	4.0	6.3
23	4.0	3.5	6		7.5	29	120	56	45	2.0	3.6	5.6
24	4.0	4.0	7		7.0	*4.3	113	68	39	*1.9	3.4	8.0
25	3.8	4.0	6		7.0	39	76	48	35	2.0	2.1	*1.4
26	3.5	3.5	5.5		7.5	18	38	50	31	2.2	6.0	1.2
27	3.5	4.0	5.5		7.8	13	31	98	28	1.6	2.8	1.0
28	3.8	4.8	5.5		7.2	14	*28	78	26	1.4	2.3	1.2
29	4.0	4.8	5.5		-	16	39	62	24	1.3	2.1	1.2
30	3.8	4.0	5		-----	16	86	65	12	2.4	2.8	1.2
31	3.5	-----	4.5		-----	18	-----	78	-----	3.6	3.4	-----
Total	99.6	118.7	164.2	186	209.1	522.4	2,232	2,276	935.2	104.7	417.3	264.3
Mean	3.21	3.96	5.30	6	7.47	16.9	74.4	73.4	31.2	3.38	13.5	8.81
Ac-ft	198	235	326	369	415	1,040	4,430	4,510	1,850	208	828	524

Calendar year 1960: Max 347 Min 0 Mean 32.1 Ac-ft 23,280  
Water year 1960-61: Max 125 Min 0 Mean 20.6 Ac-ft 14,930

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 4-12, Dec. 16 to Jan. 23. No gage-height record Jan. 24 to Feb. 14 (stage-discharge relation affected by ice during most of period), July 3-6.

## SAN JUAN RIVER BASIN

9-3710. Mancos River near Towaoc, Colo.

Location.--Lat 37°02' long 108°43', in NW¼ sec. 18, T.32 N., R.17 W., on left bank 750 ft upstream from bridge on U. S. Highway 666, 6 miles upstream from Aztec Creek, and 12 miles south of Towaoc.

Drainage area.--550 sq mi, approximately.

Records available.--October 1920 to September 1943, February 1951 to September 1961. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder at present site Oct. 13, 1941, to Sept. 30, 1943, and since Mar. 11, 1954. Datum of gage is 5,055.98 ft above mean sea level, datum of 1929. Prior to Mar. 15, 1940, staff gage or water-stage recorder 2½ miles downstream at different datum. Mar. 15, 1940, to Oct. 12, 1941, and Feb. 16, 1951, to Mar. 10, 1954, water-stage recorder at site 600 ft downstream at datum 4.95 ft lower.

Average discharge.--33 years, 55.2 cfs (39,960 acre-ft per year).

Extremes.--Maximum discharge during year, 272 cfs Aug. 17 (gage height, 2.64 ft), from rating curve extended above 150 cfs on basis of slope-area measurement at gage height 6.85 ft; no flow for many days.

1920-43, 1951-61: Maximum discharge, 5,300 cfs Oct. 14, 1941 (gage height, 7.30 ft, present site and datum), from rating curve extended above 200 cfs on basis of slope-area measurement of peak flow; no flow at times in most years.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 10,000 acres above station. One diversion above station for irrigation of about 100 acres below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	0	1.3	17
.9	.5	1.5	40
1.0	2.5	2.0	120
1.1	6.0		

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	10	2.0	5	7	12	61	60	10	0	0	15
2	0	10	2.6	4.8	7	12	76	66	10	0	a 1.4	10
3	*0	10	3.6	4.8	7.5	*16	84	72	11	0	a 7.0	9.5
4	0	10	3.0	5	8	25	91	72	12	0	a 6.5	9.0
5	0	10	2.8	5	7.5	22	102	60	12	.4	a 3.8	9.0
6	0	12	2.4	4.8	7.5	19	82	40	10	2.8	a 2.2	9.0
7	0	21	3.4	5	12	16	66	31	9.5	2.1	a 2.0	9.5
8	0	35	4.0	5.5	20	15	85	24	7.0	1.7	a 1.4	*9.5
9	0	18	4.6	5.5	34	12	82	16	*2.1	7.5	0	15
10	25	15	5	5.5	23	13	58	9.5	.4	6.0	0	28
11	5.3	13	5	5.5	28	40	50	5.6	0	3.2	0	23
12	1.9	12	5	5	48	64	*43	*5.0	.4	1.1	a 4.0	15
13	1.5	12	5	5	37	67	32	7.0	.4	.2	*a 2.8	10
14	.4	12	5	5.5	49	84	27	9.5	.1	*0	0	8.5
15	9.5	7.0	5	5.5	48	82	19	10	0	0	2.4	15
16	24	2.0	4.8	5.5	44	80	15	6.0	3.2	0	3.0	51
17	19	1.4	5	5	40	62	18	3.9	5.3	0	71	9.0
18	44	1.0	4.8	5.5	27	54	36	4.2	.4	0	78	19
19	35	1.0	5	5.5	18	54	55	16	0	0	73	58
20	17	1.0	5	5	15	43	64	15	0	0	12	*19
21	11	1.2	5	5.5	14	43	72	13	0	0	5.6	16
22	9.5	.6	5.5	5	14	40	68	8.5	0	0	3.2	16
23	9.0	.2	5.5	5.5	15	48	70	13	0	0	1.7	15
24	8.5	.2	5.5	6	16	58	73	10	0	0	18	15
25	8.0	.2	5	7	12	56	*67	*8.5	0	0	12	15
26	8.0	.2	5.5	6.5	13	48	46	7.5	0	0	33	13
27	*8.0	1.0	5.5	7	16	37	30	6.0	0	0	13	12
28	9.5	1.4	*5.5	5.5	12	37	21	6.0	0	0	9.0	10
29	10	*1.0	5.5	5	-	48	23	11	0	0	6.5	9.5
30	11	.5	5	6	-----	58	49	23	0	0	37	8.5
31	10	-----	5	*6.5	-----	55	-----	13	-----	0	35	-----
Total	285.1	219.9	141.5	169.4	599.5	1320	1665	652.2	129.6	40.3	471.5	481.0
Mean	9.20	7.33	4.56	5.46	21.4	42.6	55.5	21.0	4.32	1.30	15.2	16.0
Ac-ft	565	436	281	336	1,190	2,620	3,300	1,290	257	80	935	924

Calendar year 1960: Max 192 Min 0 Mean 24.3 Ac-ft 17,640

Water year 1960-61: Max 102 Min 0 Mean 16.9 Ac-ft 12,240

Peak discharge (base, 700 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 16 to Feb. 8.

9-3720. McElmo Creek near Colorado-Utah State line

Location.--Lat 37°19', long 109°01', in sec.2, T.35 N., R.20 W., on right bank 1½ miles upstream from Colorado-Utah State line, 2 miles upstream from Yellowjacket Creek, and 2 miles west of former town of McElmo.

Drainage area.--350 sq mi, approximately.

Records available.--March 1951 to September 1961.

Gage.--Water-stage recorder. Altitude of gage is 4,925 ft (by barometer).

Average discharge.--10 years, 37.6 cfs (27,220 acre-ft per year).

Extremes.--Maximum discharge during year, 678 cfs Sept. 18 (gage height, 5.34 ft); minimum daily, 0.8 cfs Oct. 1.

1951-61: Maximum discharge, 1,700 cfs Aug. 29, 1951, July 27, 1957 (gage height, 7.05 ft), from rating curve extended above 520 cfs on basis of slope-area measurements at gage heights 4.78 and 7.05 ft; minimum daily, 0.1 cfs for several days in 1951, 1956.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 1,000 acres above station. One diversion above station for irrigation of about 60 acres below.

Rating table, water year 1960-61, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	0.5	2.7	16
2.3	1.0	2.9	36
2.4	2.0	3.2	81
2.5	4.0	3.5	131
2.6	9.0	4.0	228

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	3.3	2.4	1.5	2.0	2.4	8.3	2.9	3.6	1.3	1.2	3.5
2	1.7	3.7	2.4	1.4	2.1	2.1	5.4	2.3	3.9	1.6	6.9	2.2
3	*1.6	3.4	2.8	1.3	2.2	*2.1	4.0	2.5	3.5	6.9	1.3	2.4
4	1.5	2.9	4.0	1.4	2.2	3.0	3.4	3.6	4.3	6.8	4.5	3.4
5	1.4	2.8	3.0	1.8	2.0	3.5	3.2	6.0	4.2	4.3	2.7	3.5
6	2.6	2.6	1.5	1.8	2.0	3.3	2.9	11.4	3.5	2.6	1.2	3.4
7	3.8	3.9	2.0	1.8	2.4	2.9	2.6	10.4	3.6	1.5	6.5	2.9
8	6	5.4	2.4	2.0	2.1	2.7	5.0	12.2	4.4	1.3	5.0	*2.8
9	8	4.2	2.4	2.0	2.6	2.7	6.0	9.9	*3.9	2.2	3.0	8.6
10	1.7	3.5	2.4	2.0	4.0	3.4	4.0	9.9	3.4	2.2	3.0	1.24
11	2.4	3.4	2.4	2.0	7.3	3.5	3.7	7.3	3.7	1.7	3.6	7.8
12	2.3	3.0	2.4	2.0	7.3	3.3	*3.5	*5.4	4.4	9.7	3.6	4.9
13	2.1	2.9	2.2	2.0	5.9	2.8	3.4	6.4	4.6	8.5	*3.8	3.6
14	2.5	2.9	2.2	1.8	5.2	2.7	3.3	10.2	4.3	*4.5	4.0	3.4
15	2.6	2.9	2.0	1.8	4.4	2.7	3.5	9.5	3.3	3.4	5.0	5.7
16	3.9	2.7	2.0	1.8	5.0	2.9	3.2	7.0	4.9	3.4	2.0	4.3
17	3.3	2.6	1.8	2.0	5.0	3.9	3.0	5.6	4.9	3.2	8.1	3.9
18	4.9	2.6	1.8	2.4	5.0	3.2	2.9	4.7	5.3	2.8	8.7	1.58
19	4.9	2.7	1.8	2.2	3.6	3.4	3.3	3.7	5.2	2.6	5.2	1.96
20	3.4	2.8	1.8	2.2	2.7	3.6	2.3	4.0	4.3	2.6	2.3	*8.9
21	2.5	2.8	1.8	2.2	2.5	3.4	2.9	4.4	3.9	3.4	2.1	6.8
22	2.1	3.3	2.0	2.2	2.6	3.2	3.4	4.3	2.9	2.4	1.6	5.9
23	2.0	3.0	2.0	2.2	2.9	2.6	2.9	3.6	2.5	2.6	9.7	6.0
24	2.1	2.8	1.8	1.9	2.7	2.8	3.9	2.8	2.2	2.6	6.0	6.2
25	2.1	2.8	1.9	2.0	2.5	3.4	*4.2	2.3	2.6	3.0	9.7	4.9
26	2.0	3.0	1.8	2.1	2.4	3.2	4.9	*2.0	1.9	2.0	9.7	4.6
27	*1.9	3.5	2.0	3.0	2.5	2.7	5.9	2.2	2.3	1.9	4.4	4.3
28	2.0	3.7	*2.3	2.0	2.5	2.8	4.9	2.8	1.9	1.9	2.3	4.2
29	2.4	*2.5	2.2	1.8	-	3.9	3.5	3.6	2.0	2.4	1.4	4.3
30	2.7	2.4	2.2	1.9	-----	6.7	2.6	3.9	1.5	2.2	1.3	3.6
31	2.7	-----	1.6	*1.9	-----	7.8	-----	3.9	-----	7.0	6.2	-----
Total	612.4	94.0	67.3	60.4	95.6	102.6	116.0	170.7	106.9	396.1	731.8	173.8
Mean	19.8	31.3	21.7	19.5	34.1	33.1	38.7	55.1	35.6	12.8	23.6	57.9
Ac-ft	1,210	1,860	1,330	1,200	1,900	2,040	2,300	3,390	2,120	786	1,450	3,450

Calendar year 1960: Max 379 Min 0.6 Mean 35.9 Ac-ft 26,030  
 Water year 1960-61: Max 196 Min 0.8 Mean 31.8 Ac-ft 23,040

Peak discharge (base, 1,200 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 30 to Dec. 2, Dec. 5-20, Jan. 5-24, 27-29.

## TRANSMOUNTAIN DIVERSIONS

## Transmountain diversions from Colorado River basin in Colorado

There are 21 tunnels or ditches, all of which are equipped with water-stage recorders and Parshall flumes or sharp-crested weirs. Records furnished by State engineer. The locations of these diversions are given in the following list.

9-100. Grand River ditch diverts water from tributaries of Colorado River to La Poudre Pass Creek (tributary to Cache la Poudre River) in NW $\frac{1}{4}$  sec.21, T.6 N., R.75 W., in Platte River basin. Two collection ditches beginning at headgates located in sec.28, T.5 N., R.76 W., and sec.29, T.6 N., R.75 W., intercept all tributaries upstream on each side of the Colorado River and converge at La Poudre Pass.

9-120. Eureka ditch diverts water from tributaries of Tonahutu Creek between headgate in sec.7, T.4 N., R.74 W., and Sprague Pass, in Colorado River basin, to Spruce Creek (tributary to Big Thompson River) in sec.16, T.4 N., R.74 W., in Platte River basin.

9-130. Alva B. Adams tunnel diverts water from Grand Lake and Shadow Mountain Lake in NW $\frac{1}{4}$  sec.9, T.3 N., R.75 W., in Colorado River basin, to Lake Estes (Big Thompson River) in sec.30, T.5 N., R.72 W., in Platte River basin. For daily discharge, see elsewhere in this report.

9-215. Berthoud Pass ditch diverts water from tributaries of Fraser River between headgate in sec.33, T.2 S., R.75 W., and Berthoud Pass, in Colorado River basin, to Hoop Creek (tributary to West Fork Clear Creek) in sec.10, T.3 S., R.75 W., in Platte River basin.

9-225. Moffat water tunnel diverts water from tributaries of Fraser River in Colorado River basin to South Boulder Creek in sec.2, T.2 S., R.74 W., in Platte River basin by means of three collection ditches extending from the right bank of St. Louis Creek in sec.20, T.2 S., R.76 W., right bank of Vasquez Creek in sec.18, T.2 S., R.75 W., right bank of Fraser River in sec.23, T.2 S., R.75 W., left bank of North Fork Ranch Creek in sec.24, T.1 S., R.75 W., and intercepting intermediate tributaries to the west portal of the tunnel. Since July 1959, water diverted by Jones Pass tunnel from tributaries of Williams Fork in Colorado River basin between headgates on right bank of Bobtail Creek in sec.28, T.3 S., R.76 W., and headgate on left bank of McQueary Creek in sec.16, T.3 S., R.76 W., has been redirected through Vasquez tunnel to Vasquez Creek in the Fraser River basin in sec.1, T.3 S., R.76 W., thence via collection ditch to the west portal of Moffat water tunnel where it is diverted to South Boulder Creek in sec.2, T.2 S., R.74 W., in Platte River basin. (See table of diversions by Jones Pass tunnel published with records for Williams Fork near Leal, Colo.)

9-420. Hoosier Pass tunnel diverts water from tributaries of Blue River in Colorado River basin to Montgomery Reservoir (Middle Fork South Platte River) in sec.14, T.8 S., R.78 W., in Platte River basin; this water is again diverted to South Catamount Creek (tributary to Catamount Creek) in SE $\frac{1}{4}$  sec.14, T.13 S., R.69 W., in the Arkansas River basin. Three collection conduits, from Monte Cristo Creek in SW $\frac{1}{4}$  sec.2, T.8 S., R.78 W., Bemrose Creek in SW $\frac{1}{4}$  sec.6, T.8 S., R.77 W., and McCullough Gulch in sec.26, T.7 S., R.78 W., intercept intermediate tributaries and converge at north portal of the tunnel.

9-460. Boreas Pass ditch diverts water from tributaries of Blue River between headgate in sec.26, T.7 S., R.77 W., and Boreas Pass, in Colorado River basin, to Tarryall Creek in sec.26, T.7 S., R.77 W., in Platte River basin.

9-485. Fremont Pass ditch diverts water from tributaries of Tenmile Creek in secs.2 and 3, T.8 S., R.79 W., in Blue River basin, to East Fork Arkansas River in sec.11, T.8 S., R.79 W., in Arkansas River basin.

9-615. Columbine ditch diverts water from tributaries of Eagle River in sec.5, T.8 S., R.79 W., in Colorado River basin, to Chalk Creek (tributary to East Fork Arkansas River) in NW $\frac{1}{4}$  sec.9, T.8 S., R.79 W., in Arkansas River basin.

9-620. Ewing ditch diverts water from Piney Creek in sec.11, T.8 S., R.80 W., in Eagle River basin, to Thayer Gulch (tributary to Tennessee Creek) in sec.11, T.8 S., R.80 W., in Arkansas River basin.

9-625. Wurtz ditch diverts water from tributaries of Eagle River between headgate in sec.32, T.7 S., R.80 W., and Tennessee Pass, in Colorado River basin, to West Tennessee Creek (tributary to Tennessee Creek), revised, in sec.17, T.8 S., R.80 W., in Arkansas River basin.

9-730. Twin Lakes tunnel diverts water from tributaries of Roaring Fork between headgates (in sec.21, T.11 S., R.83 W., and sec.11, T.11 S., R.82 W.), and west portal of Twin Lakes tunnel (in sec.24, T.11 S., R.83 W.), in Colorado River basin, to North Fork Lake Creek in sec.22, T.11 S., R.82 W., in Arkansas River basin.

9-775. Busk-Ivanhoe tunnel diverts water from Ivanhoe Lake (Ivanhoe Creek, revised), tributary to Fryingpan Creek, in sec.15, T.9 S., R.82 W., in Roaring Fork basin, to Busk Creek (tributary to Lake Fork) in sec.20, T.9 S., R.81 W., in Arkansas River basin.

9-1150. Larkspur ditch diverts water from tributaries of Tomichi Creek between headgates (in sec.11, T.48 N., R.6 E., and sec.1, T.47 N., R.6 E.), and Marshall Pass, in Gunnison River basin, to Poncha Creek (tributary to South Arkansas River, revised) in SE $\frac{1}{4}$  sec.24, T.48 N., R.6 E., in Arkansas River basin.

9-1182. Tarbell ditch diverts water from Lake Fork Cochetopa Creek, revised (tributary to Cochetopa Creek), in NW $\frac{1}{4}$  sec.18 (revised), T.43 N., R.2 E., in Gunnison River basin, to Lake Fork Saguache Creek, revised (tributary to Middle Fork Saguache Creek) in NE $\frac{1}{4}$  sec.18 (revised), T.43 N., R.2 E., in Rio Grande basin. All records available prior to October 1960 published in WSP 1733.

9-1210. Tabor ditch diverts water from tributaries of Cebolla Creek in secs.29 and 36, T.43 N., R.3 W., in Gunnison River basin, to Corral Creek (formerly Big Spring Creek), tributary to North Clear Creek (revised) in sec.25, T.43 N., R.3 W., in Rio Grande basin.



## Transmountain diversions from Colorado River basin in Colorado--Continued

9-3410. Treasure Pass ditch diverts water from tributaries of Wolf Creek between headgates (in sec.31, T.38 N., R.2 E., and sec.6, T.37 N., R.2 E.), and Wolf Creek Pass, in San Juan River basin, to tributary of South Fork Rio Grande in sec.31, T.38 N., R.2 E., in Rio Grande basin.

9-3470. Piedra Pass ditch (Harley Fuchs ditches 1 and 2) diverts water from tributaries of Piedra River between headgates (in NW $\frac{1}{4}$  sec.4, T.38 N., R.1 W., and SW $\frac{1}{4}$  sec.33, T.39 N., R.1 W.), and Piedra Pass, in San Juan River basin, to South River in sec.4, T.38 N., R.1 W., in Rio Grande basin.

9-3480. Squaw Pass ditch diverts water from Williams Creek (tributary to Piedra River) in sec.13, T.39 N., R.3 W., in San Juan River basin, to Squaw Creek in sec.10, T.39 N., R.3 W., in Rio Grande basin.

9-3510. Fuchs ditch diverts water from North Fork Los Pinos River (tributary to Los Pinos River) in sec.4, T.39 N., R.4 W., in San Juan River basin, to Weminuche Creek in sec.33, T.40 N., R.4 W., in Rio Grande basin.

9-3515. Raber-Lohr ditch diverts water from left bank of Rincon la Vaca Creek (tributary to Los Pinos River) in sec.5, T.39 N., R.4 W., in San Juan River basin, to Weminuche Creek in sec.33, T.40 N., R.4 W., in Rio Grande basin.

## Transmountain diversions from Colorado River basin in Colorado

Diversions, in acre-feet, water year October 1960 to September 1961

Diversion	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Water year
<b>TO PLATTE RIVER BASIN</b>													
Grand River ditch.....	0	0	0	0	0	0	0	194	3,390	4,760	1,420	115	9,880
Eureka ditch.....	0	0	0	0	0	0	0	0	28	11	0	0	39
Alva B. Adams tunnel.....	26,000	25,390	24,300	23,540	22,620	25,390	16,020	14,480	0	9,430	13,170	8,400	208,700
Berthoud Pass ditch.....	0	0	0	0	0	0	0	0	4.8	254	52	0	311
Moffat water tunnel.....	1,200	538	787	674	523	480	753	9,310	20,410	8,960	5,290	5,070	54,000
Boreas Pass ditch.....	0	0	0	0	0	0	0	0	46	25	15	41	127
Total.....	27,200	25,930	25,090	24,210	23,140	25,870	16,770	23,980	23,880	23,440	19,950	13,630	273,100
<b>TO ARKANSAS RIVER BASIN</b>													
Hoosier Pass tunnel.....	0	0	0	0	0	0	0	1,180	3,840	428	0	751	6,200
Fremont Pass ditch.....	0	0	0	0	0	0	0	0	0	0	0	0	0
Columbine ditch.....	0	0	0	0	0	0	0	235	733	103	21	0	1,090
Ewing ditch.....	0	0	0	0	0	0	0	205	318	113	29	0	665
Wurtz ditch.....	0	0	0	0	0	0	0	650	672	84	18	0	1,420
Twin Lakes tunnel.....	0	202	111	86	78	87	84	8,790	17,170	2,950	1,750	4,740	36,050
Busk-Ivanhoe tunnel.....	23	0	0	0	0	0	0	713	2,510	656	217	475	4,590
Larkspur ditch.....	0	0	0	0	0	0	0	6.1	32	0	0	0	38
Total.....	23	202	111	86	78	87	84	11,780	25,280	4,330	2,040	5,970	50,050
<b>TO RIO GRANDE BASIN</b>													
Tarbell ditch.....	0	0	0	0	0	0	0	12	270	61	0	0	343
Tabor ditch.....	0	0	0	0	0	0	0	87	157	0	0	0	244
Treasure Pass ditch.....	0	0	0	0	0	0	0	55	159	0	0	0	214
Piedra Pass ditch.....	0	0	0	0	0	0	0	0	0	0	0	0	0
Squaw Pass ditch.....	0	0	0	0	0	0	0	0	236	93	32	0	361
Fuchs ditch.....	0	0	0	0	0	0	0	155	566	84	90	6.9	902
Raber-Lohr ditch.....	0	0	0	0	0	0	0	0	998	324	293	23	1,640
Total.....	0	0	0	0	0	0	0	309	2,390	562	415	30	3,700
Grand total.....	27,220	26,130	25,200	24,300	23,220	25,960	16,860	36,070	51,540	28,340	22,400	19,620	326,800

## DISCHARGE AT MISCELLANEOUS SITES

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## Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations are given in the following table. Those that are measurements of base flow are designated by an asterisk (\*); measurements of peak flow by a dagger (†).

Discharge measurements made at miscellaneous sites during water year 1961

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Platte River basin						
Russellville Gulch.	Cherry Creek....	NW $\frac{1}{4}$ sec.11, T.8 S., R.66 W., at bridge 0.6 mile above mouth and 1.5 miles south of Franktown, Colo.	16.9		7-31-61	†2,900
Russell Gulch....	North Clear Creek.	NW $\frac{1}{4}$ sec.28, T.3 S., R.72 W., 0.4 mile above mouth and 3.5 miles southeast of Blackhawk, Colo.	8.17		7- 8-61	†727
Unnamed tributary.	North St. Vrain Creek.	NE $\frac{1}{4}$ sec.13, T.3 N., R.71 W., 500 ft above mouth and 0.8 mile northwest of Lyons, Colo.	.45		6- 3-61	†235
Arkansas River basin						
Arkansas River tributary No. 2	Arkansas River..	NE $\frac{1}{4}$ sec.13, T.18 S., R.72 W., at culvert on U. S. Highway 50, 1.00 mile west of Parkdale, Colo.	.16		7-27-61	†284
Arkansas River tributary.	.....do.....	NE $\frac{1}{4}$ sec.13, T.18 S., R.72 W., at culvert on U. S. Highway 50, 0.95 mile west of Parkdale, Colo.	.84		7-27-61	†930
McIntyre Gulch...	Copper Gulch....	NW $\frac{1}{4}$ sec.19, T.18 S., R.71 W., at road crossing, 1.3 miles southwest of Parkdale, Colo.	4.80		7-27-61	†8,500
Sweetwater Creek basin						
Sweetwater Creek.	Colorado River..	Lat 39°50'35", long 107°14'20", 1 $\frac{1}{2}$ miles above Dry Sweetwater Creek and 17 miles northwest of Dotsero, Colo.	12.9		10-25-60 5- 9-61	*8.09 10.5
Dry Sweetwater Creek.	Sweetwater Creek	Lat 39°49'15", long 107°14'40", 1 mile above mouth and 16 miles northwest of Dotsero, Colo.	6.22		10-25-60 5- 9-61 6-13-61	*4.19 5.64 18.0
Sweetwater Creek.	Colorado River..	Lat 39°48'50", long 107°11'20", a quarter of a mile above Turret Creek and 14 miles northwest of Dotsero, Colo.	27.3		10-26-60 5- 8-61 6-13-61	*16.2 22.0 62.6
Turret Creek.....	Sweetwater Creek	Lat 39°51'05", long 107°10'10", 3 $\frac{1}{2}$ miles above mouth and 16 miles northwest of Dotsero, Colo.	10.6		10-25-60 5- 8-61 6-13-61	*5.21 4.48 39.1
Do.....	.....do.....	Lat 39°48'50", long 107°10'55", at mouth, 14 miles northeast of Dotsero, Colo.	18.7		10-26-60 5- 9-61 6-13-61	*7.33 11.3 62.4
Kings Spring.....	.....do.....	Lat 39°48'20", long 107°10'30", 100 ft below spring, 300 ft above mouth and 13 miles northwest of Dotsero, Colo.	-		10-26-60	5.85
Sweetwater Creek.	Colorado River..	Lat 39°47'45", long 107°09'05", half a mile below Sweetwater Lake and 12 miles northwest of Dotsero, Colo.	57.7		10-26-60 5- 8-61 6-14-61	*34.0 43.8 121
Deep Creek basin						
Deep Creek.....	Colorado River..	Lat 39°46'30", long 107°17'30", at Deep Lake outlet, 16 miles northwest of Dotsero, Colo.	6.68		10-12-60 4-18-61 6-12-61 6-28-61	*.57 *.07 91.8 5.05
Roaring Fork basin						
Rocky Fork.....	Fryingpan Creek.	NW $\frac{1}{4}$ sec.18, T.8 S., R.84 W., near private bridge at mouth, 1 $\frac{1}{4}$ miles west of Ruedi, Colo.	b13	1959-60	10- 4-60 11- 1-60 12- 1-60 1- 3-61 3- 9-61 3-28-61 4-25-61 5-24-61 6-27-61 7-18-61 8-15-61 9-13-61	*2.11 *1.48 *3.19 *2.06 *1.98 *1.63 3.61 22.7 8.35 4.23 *3.14 *3.52

\* Base flow.

† Peak flow.

a About.

b Approximately.

## DISCHARGE AT MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1961--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Roaring Fork basin--Continued						
Avalanche Creek..	Crystal River...	SE $\frac{1}{4}$ sec.28, T.9 S., R.88 W., 1 mile above mouth and 4 $\frac{1}{2}$ miles north of Redstone, Colo.	41.8	1909, 1955-57*, 1958-60	10- 3-60 11- 1-60 12- 2-60 1- 5-61 3- 3-61 3-29-61 4-24-61 6-27-61 7-20-61 8-14-61 9-14-61	*26.7 *33.4 *14.5 *9.8 *12.8 *4.79 11.0 165 47.0 *30.1 *46.0
Roan Creek basin						
Roan Creek.....	Colorado River..	SE $\frac{1}{4}$ sec.32, T.6 S., R.98 W., 1 mile above Clear Creek and 13 miles north of De Beque, Colo.	140		8-10-61	*4.25
Clear Creek.....	Roan Creek.....	W $\frac{1}{2}$ sec.34, T.6 S., R.98 W., 100 ft above diversion headgate, 1 mile above mouth, and 12 miles north of De Beque, Colo.	110		8-10-61	*3.42
Roan Creek.....	Colorado River..	On line between secs.10 and 15, T.7 S., R.98 W., at highway bridge half a mile below Kimball Creek and 11 miles north of De Beque, Colo.	b210	1921-26*, 1958	8-10-61	*9.44
Do.....	.....do.....	SE $\frac{1}{4}$ sec.25, T.7 S., R.98 W., 300 ft below Conn Creek and 6 $\frac{1}{2}$ miles north of De Beque, Colo.	359		8-10-61	*8.14
Indian Wash basin						
Indian Wash.....	Colorado River..	At junction of 28 Road and North Avenue in Grand Junction, Colo., 1 $\frac{1}{2}$ miles above mouth.	14		8- 3-61	†608
Colorado River Main Stem						
Colorado River...	Gulf of California....	Sec.23, T.1 S., R.1 W., Ute Meridian, at highway bridge at Grand Junction, Colo., a quarter of a mile above Gunnison River.	b8,910	1897-99*, 1901, 1958-60	9- 1-61	529
Do.....	.....do.....	Sec.20, T.1 N., R.2 W., Ute special base and meridian, at highway bridge 1 $\frac{1}{2}$ miles south of Fruita, 12 miles below Gunnison River.	b17,100	1908-23*	9- 1-61	1,970
Green River basin						
South Fork White River.	White River.....	Lat 39°50'40", long 107°20'10", at Budge Resort, 600 ft above Wagonwheel Creek and 21 miles north of Glenwood Springs, Colo.	50.4		6-12-61	510
Wagonwheel Creek.	South Fork White River.	Lat 39°50'40", long 107°20'10", at mouth at Budge Resort, 21 miles north of Glenwood Springs, Colo.	7.42		10-12-60 5-17-61 6-13-61	c.2 5.38 85.5
South Fork White River.	White River.....	Lat 39°50'45", long 107°20'20", at Budge Resort, 600 ft below Wagonwheel Creek and 21 miles north of Glenwood Springs, Colo.	57.9		10-12-60 5-17-61	*58.8 119

\* Base flow.

† Peak flow.

\* Operated as a continuous-record gaging station.

b Approximately.

c Estimated.



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