DEPARTMENT OF THE INTERIOR
Hubert Work, Secretary

U. S. GEOLOGICAL SURVEY
George Otis Smith, Director

Water-Supply Paper 549

SURFACE WATER SUPPLY OF THE UNITED STATES

1922

PART IX. COLORADO RIVER BASIN

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Prepared in cooperation with
THE STATES OF COLORADO, WYOMING, UTAH
and ARIZONA

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SURFACE WATER SUPPLY OF COLORADO RIVER BASIN, 1922

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting records of measurements of flow made on streams in the United States during the year ending September 30, 1922.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation in the arid West. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following item:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1922

1895	$12, 500. 00
1896	20, 000. 00
1897 to 1900, inclusive	50, 000. 00
1901 to 1902, inclusive	100, 000. 00
1903 to 1906, inclusive	200, 000. 00
1907	150, 000. 00
1908 to 1910, inclusive	100, 000. 00
1911 to 1917, inclusive	150, 000. 00
1918	175, 000. 00
1919	148, 244. 10
1920	175, 000. 00
1921 to 1923, inclusive	180, 000. 00

In the execution of the work many private and State organizations have cooperated either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 9.

Measurements of stream flow have been made at about 5,480 points in the United States and also at many points in Alaska and

the Hawaiian Islands. In July, 1922, 1,540 gaging stations were being maintained by the Survey and the cooperating organizations. Many miscellaneous discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miners' inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, acre-feet, and millions of cubic feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

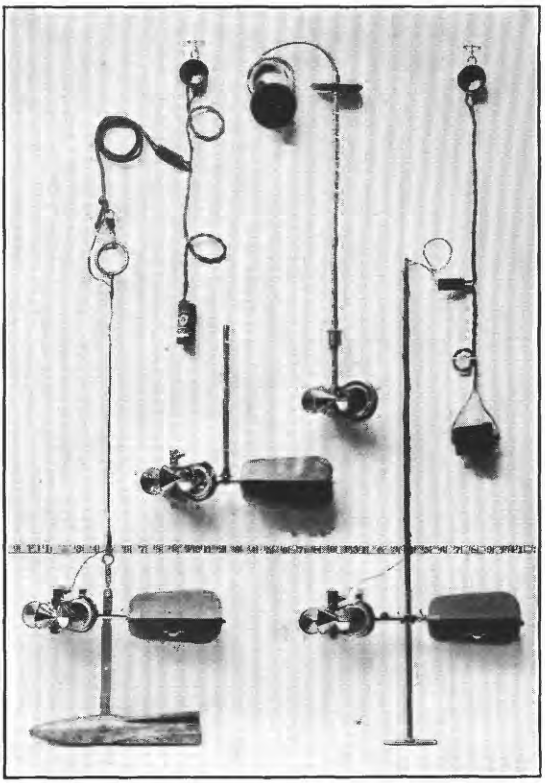
An "acre-foot," equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

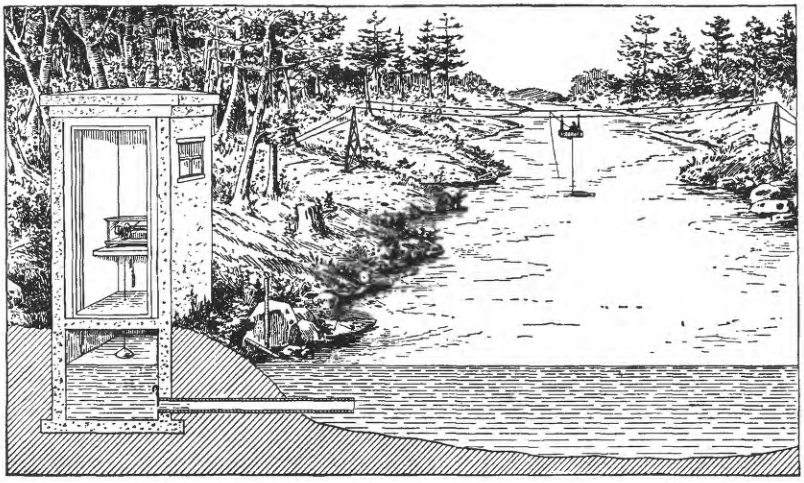
"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the section or sections of the stream channel below the gage which determine the stage-discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.

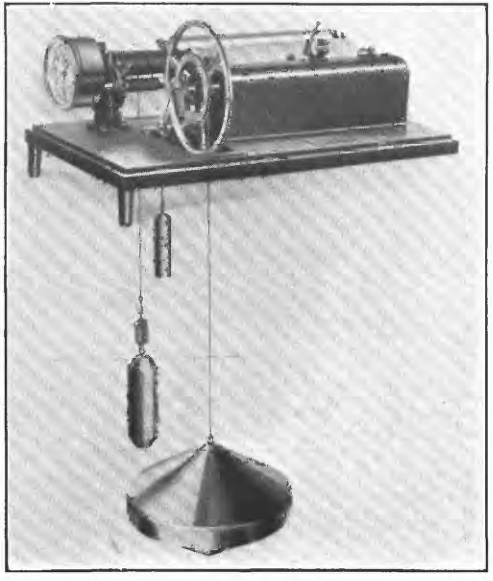
The "point of zero flow" for a gaging station is that point on the gage—the gage height—at which water ceases to flow over the control.



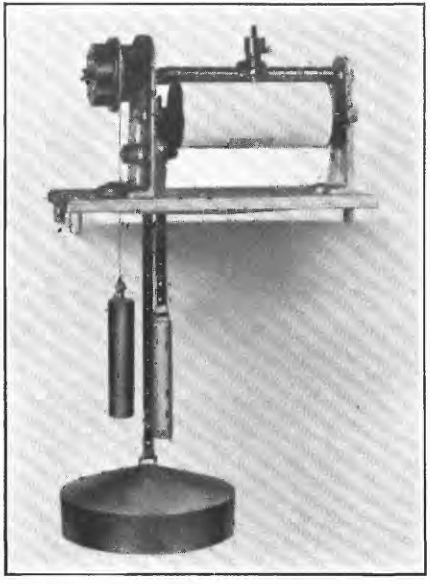
A. PRICE CURRENT METERS



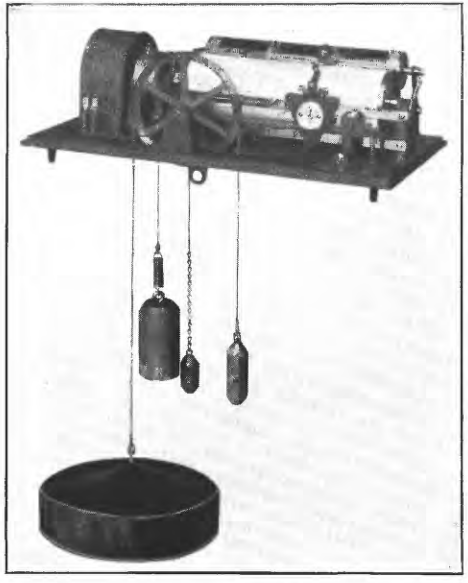
B. TYPICAL GAGING STATION



A



B



C

WATER-STAGE RECORDERS

A, Au; *B*, Gurley; *C*, Stevens

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1921, and ending September 30, 1922. At the beginning of January in most parts of the United States much of the precipitation in the preceding three months is stored as ground water, in the form of snow or ice, or in ponds, lakes, and swamps, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. (See Pls. I, II.)

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage heights to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is determined.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table giving records of discharge measurements, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage height and records of discharge measurements are published.

The description of the station gives, in addition to statements regarding location and equipment, information in regard to any conditions that may affect the permanence of the stage-discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of control, and the cause and effect of backwater. It gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders the

mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by use of the discharge integrator, an instrument operating on the principle of the planimeter and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation, and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

A paragraph in the description of the station gives information regarding the (1) permanence of the stage-discharge relation, (2) precision with which the discharge rating curve is defined, (3) refinement of gage readings, (4) frequency of gage readings, and (5) methods of applying daily gage height to the rating table to obtain the daily discharge.

For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and depth in inches may be misleading owing to the inclusion of large noncontributing districts in the measured drainage area, and they may also be subject to gross errors caused by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches. All figures representing "second-feet per square mile" and "run-off in inches" previously published by the survey should be

used with caution because of possible inherent sources of error not known to the survey.

The table of monthly discharge gives only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, also, that the observations in each succeeding year may be expected to throw new light on data previously published.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow in streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, ground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the monographs, bulletins, professional papers, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

Part I. North Atlantic slope basins.
II. South Atlantic slope and eastern Gulf of Mexico basins.
III. Ohio River basin.
IV. St. Lawrence River basin.
V. Upper Mississippi River and Hudson Bay basins.
VI. Missouri River basin.
VII. Lower Mississippi River basin.
VIII. Western Gulf of Mexico basins.
IX. Colorado River basin.
X. Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basin in three parts:
A, Pacific slope basins in Washington and upper Columbia River basin.
B, Snake River basin.
C, Lower Columbia River basin and Pacific slope basins in Oregon.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below:

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Boston, Mass., 2500 Customhouse.
Albany, N. Y., 704 Journal Building.
Trenton, N. J., Statehouse.
Charlottesville, Va., care of University of Virginia.
Asheville, N. C., 316 Jackson Building.
Chattanooga, Tenn., 37 Municipal Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Chicago, Ill., 940 Transportation Building.
Madison, Wis., care of Railroad Commission of Wisconsin.
Ames, Iowa, State Highway Commission Building.
Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Topeka, Kans., 23 Federal Building.
Helena, Mont., 45–46 Federal Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, Federal Building.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 600 Federal Building.
Tucson, Ariz., College of Law Building, University of Arizona.
Austin, Tex., State Capitol.
Honolulu, Hawaii, Territorial Office Building.

A list of the Geological Survey's publications may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,480 points in the United States, and the data obtained have been published in the reports tabulated on page 8.

Stream-flow data in reports of the United States Geological Survey

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	1884 to Sept., 1890.
11th A, pt. 2	Monthly discharge and descriptive information	1884 to June 30, 1891.
12th A, pt. 2	do	1884 to Dec. 31, 1892.
13th A, pt. 3	Mean discharge in second-feet	
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records), 1897.	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.

Stream-flow data in reports of the United States Geological Survey—Continued

Report	Character of data	Year
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910.
W 301 to 312	do	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919 and 1920.
W 521 to 534	do	1921.
W 541 to 554	do	1922.

NOTE.—No stream-flow data are given in the fifteenth and seventeenth annual reports.

The records at most of the stations discussed in these reports extend over a series of years, and miscellaneous measurements at many points other than regular gaging stations have been made each year. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1920. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data from 1902 to 1922 for any station in the area covered by Part III are published in Water-Supply Papers 83, 98, 128, 169, 205, 243, 263, 283, 303, 323, 353, 383, 403, 433, 453, 473, 503, 523, and 543 which contained records for the Ohio River basin for those years.

Numbers of water-supply papers containing results of stream measurements, 1899–1922

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
												North Pacific slope basins		
	North Atlantic slope basins (St. John River to York River)	South Atlantic and eastern Gulf of Mexico (James River to the Mississippi)	Ohio River basin	St. Lawrence River and Great Lakes basins	Hudson Bay and upper Mississippi River basins	Missouri River basin	Lower Mississippi River basin	Western Gulf of Mexico basin	Colorado River basin	Great Basin	Pacific slope basins in California	Pacific slope basins in Washington and upper Columbia River	Snake River basin	Lower Columbia River and Pacific slope basins in Oregon
1899 [a]	35	[b] 35, 36	36	36	36	[c] 36, 37	37	37	[d] 37, 38	38, [e] 39	38, [f] 39	38	38	38
1900 [g]	47, [h] 48	48	48, [i] 49	49	49	49, [i] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[k] 65, 66, 75	66, 75	[k] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[l] 82, 83	[k] 83, 85	84	[k] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[k] 98, 99, [m] 100	99	[k] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [o] 125, [p] 126	[p] 126, 127	128	129	[k] 128, 130	130, [q] 131	[k] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [o] 166, [p] 167	[p] 167, 168	169	170	171	172	[k] 169, 173	174	175, [s] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [o] 202, [p] 203	[p] 203, 204	205	206	207	208	[k] 205, 209	210	211	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332–A	332–B	332–C
1913	351	352	353	354	355	356	357	358	359	360	361	362–A	362–B	362–C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables of monthly discharge for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern rivers and south Pacific slope basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Tables of monthly discharge for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill rivers to James River.
[i] Scioto River.
[j] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas rivers.
[r] Great Basin in California except Truckee and Carson River basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz rivers only.

COOPERATION

The work in Arizona, Utah, and Wyoming was carried on under cooperative agreement between the United States Geological Survey and the States, and special acknowledgments are due the cooperating State officials, W. S. Norveil, State water commissioner of Arizona; R. E. Caldwell, State engineer of Utah; and Frank C. Emerson, State engineer of Wyoming.

The State engineer of Colorado, A. J. McCune, paid the gage observers and furnished other assistance at four stations in Colorado.

The United States Forest Service furnished the gage-height records at eight stations and the services of a hydrographer for part of the time during the winter for work in Colorado and Wyoming.

The United States Weather Bureau paid the gage observers at the station on Colorado River near Fruita, Colo., and on Green River at Green River, Wyo.

The Office of Indian Affairs assisted in the maintenance of stations in Utah and Arizona.

On Colorado River in Arizona, the United States Bureau of Reclamation furnished financial assistance for maintaining the station near Topock. The entire cost of the installation and maintenance of the station at Lees Ferry was borne by the Southern California Edison Co.

Assistance in the collection of data was rendered by the Utah Power & Light Co., Vernal Milling & Light Co., Redlands Co., Eden Irrigation & Land Co., and C. H. Beggs.

DIVISION OF WORK

Data for the stations in Arizona were collected and prepared for publication under the direction of Roger C. Rice and W. E. Dickinson, district engineers, who were assisted by J. H. Gardiner, D. A. Dudley, and H. D. Empie. G. F. Holbrook assisted in the preparation of the data for publication.

Data for the stations in Wyoming and Colorado were collected and prepared for publication under the direction of Robert Follansbee, district engineer, who was assisted by P. V. Hodges, J. B. Spiegel, M. B. Arthur, T. J. Watkins, and Miss Florence M. Hall.

Data for the stations in Utah were collected and prepared for publication under the direction of A. B. Purton, district engineer, assisted by W. E. Dickinson, R. R. Rowe, J. W. Mangan, M. T. Wilson, D. M. Corbett, and Miss Lysle Christensen.

The records were reviewed and the manuscript assembled by H. C. Troxell and J. H. Morgan.

GAGING-STATION RECORDS

COLORADO RIVER BASIN

COLORADO RIVER AND TRIBUTARIES ABOVE GREEN RIVER

COLORADO RIVER AT HOT SULPHUR SPRINGS, COLO.

LOCATION.—In sec. 2, T. 1 N., R. 78 W., at highway bridge near Denver & Salt Lake Railway station in Hot Sulphur Springs, Grand County.

DRAINAGE AREA.—785 square miles (revised measurement on map of Colorado, scale 1 : 500,000).

RECORDS AVAILABLE.—July 22, 1904, to September 30, 1909; September 23, 1910, to September 30, 1922.

GAGE.—Chain gage on downstream side of bridge; read by Forest Service employee. Prior to April 16, 1906, staff gage set to datum 6.07 feet lower was located 1,000 feet downstream.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of well-compacted gravel. Control 150 feet downstream; shifting at long intervals. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.15 feet at 8.30 a. m. June 14 (discharge, 3,790 second-feet); minimum discharge occurred during winter.

1904–1909; 1910–1922: Maximum stage recorded, 8.7 feet at 5 a. m. June 15, 1921 (discharge, 10,300 second-feet); minimum discharge, 63 second-feet, February 15 and 25–27, 1908.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Water diverted for the irrigation of 18,000 acres from Colorado River and tributaries above station. In addition, 12,400 acre-feet were diverted into Cache la Poudre drainage basin during 1922.

REGULATION.—Diurnal fluctuation during spring of year from alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation permanent; affected by ice during winter. Rating curve well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records excellent.

Discharge measurements of Colorado River at Hot Sulphur Springs, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 20	Hodges and McCallister	[a] 3.72	140	May 27	Robert Follansbee	5.78	3,250
Feb. 11	J. C. McCallister	[a] 3.5	110	July 6	M. B. Arthur	3.32	992
Apr. 25	Follansbee and McCallister	2.55	615				

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Colorado River at Hot Sulphur Springs, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	358	170						905	2,310	1,240	401	336
2	358	163						905	2,110	1,120	445	358
3	272	160						905	2,210	1,020	491	294
4	272	138		125				960	2,110	960	423	294
5	230	129	112		111	112		960	1,930	850	380	315
6	230	123						1,120	2,310	905	380	272
7	230	129					180	1,240	2,530	1,020	358	251
8	230	129						1,300	3,270	905	336	234
9	230	132						1,300	3,560	850	315	219
10	230	126						1,180	3,560	850	272	193
11	230	120		135				1,070	3,270	795	315	193
12	230	129						960	3,130	740	315	170
13	230	129						960	3,130	590	272	157
14	230						170	690	3,410	565	294	151
15	230		132		114	130	212	740	3,000	540	272	144
16	230						247	740	2,530	540	294	144
17	230						167	740	1,930	540	272	144
18	230	116		129			154	1,020	1,750	491	423	144
19	230						154	1,180	1,930	468	491	144
20	230						170	1,360	2,110	468	445	141
21	230						215	1,590	2,020	468	423	132
22	230						401	1,590	2,020	491	401	120
23	230			121			540	1,930	1,750	468	380	120
24	204				110		565	2,210	1,670	445	358	114
25	197	114	147			148	615	2,760	1,670	445	380	109
26	193						690	3,000	1,670	380	350	109
27	193						665	3,130	1,430	358	294	112
28	193			118			615	3,130	1,300	358	272	126
29	197						690	3,410	1,300	491	294	126
30	190						665	3,410	1,300	423	315	132
31	180							2,760		401	315	

NOTE.—Stage-discharge relation affected by ice Nov. 14 to Apr. 13; discharge based on temperature and gage-height records, two discharge measurements, and observer's notes. Braced figures show mean discharge for periods indicated.

Monthly discharge of Colorado River at Hot Sulphur Springs, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	358	180	232	14,300
November	170		128	7,620
December			126	7,750
January			126	7,750
February			112	6,220
March			131	8,060
April	690		309	18,400
May	3,410	690	1,590	97,800
June	3,560	1,300	2,270	135,000
July	1,240	358	651	40,000
August	491	272	354	21,800
September	358	109	183	10,900
The year	3,560		519	376,000

COLORADO RIVER AT GLENWOOD SPRINGS, COLO.

LOCATION.—In sec. 9, T. 6 S., R. 89 W., at Glenwood Springs, Garfield County. No Name Creek enters Colorado River 2 miles above station and Roaring Fork half a mile below.

DRAINAGE AREA.—4,560 square miles (revised, measured on map of Colorado, scale, 1 : 500,000).

RECORDS AVAILABLE.—January 1, 1900, to September 30, 1922; also May 12 to July 17, 1899, at point just above Roaring Fork.

GAGE.—Friez water-stage recorder on right bank in front of power house installed May 17, 1910; inspected by Forest Service employee and C. H. Oberly. Prior to that date, a staff gage referred to same datum was used.

DISCHARGE MEASUREMENTS.—Made from cable beneath State Street bridge, a third of a mile below gage.

CHANNEL AND CONTROL.—Bed composed of well-compacted gravel, on which silt is deposited. Control at riffle 300 feet downstream; practically permanent. Banks not subject to overflow except at extreme high stages.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 9.3 feet at 7 a. m. June 10 (discharge, 16,100 second-feet); minimum stage, 1.9 feet at 5 p. m. January 22 (discharge, 90 second-feet).

1900–1922: Maximum stage recorded, 12.55 feet at noon June 14 and 15, 1918 (discharge, 30,100 second-feet); minimum stage, 1.6 feet at 5 p. m. February 6, 1921 (discharge, 80 second-feet).

ICE.—Stage-discharge relation not affected by ice; hot water from springs keeps river open.

DIVERSIONS.—Between this station and Hot Sulphur Springs, court decrees for diversions of 48 second-feet of water from Colorado River for irrigation, and 1,250 second-feet for power. Water diverted for power is returned to river above Glenwood Springs.

REGULATION.—Shoshone power plant of Colorado Power Co., 7 miles upstream, controls flow during day at low water but has insufficient pondage to control it for more than a few hours.

ACCURACY.—Stage-discharge relation shifted slightly February 5. Two well defined rating tables. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage height obtained by inspection of recorder graph, or for days of considerable diurnal fluctuation by averaging the bi-hourly discharge. Records excellent, except for days of missing gage heights, for which they are fair.

Discharge measurements of Colorado River at Glenwood Springs, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Jan. 24	T. J. Watkins	3.40	734	Mar. 19	T. J. Watkins	4.10	1,550
Feb. 5	J. B. Spiegel	2.55	300				

Daily discharge, in second-feet, of Colorado River at Glenwood Springs, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,180	1,140	1,000	1,040	652	805	1,240	3,500	13,500	5,910	2,180	1,640
2	1,180	1,140	1,120	979	665	733	1,220	3,710	11,200	5,500	2,240	1,760
3	1,180	1,110	1,050	964	600	790	1,250	3,820	10,800	4,980	2,520	1,810
4	1,180	1,100	969	1,060	978	790	1,480	4,030	10,500	4,610	2,520	1,700
5	1,180	1,100	633	920	726	882	1,870	4,370	10,100	4,490	2,180	1,700
6	1,150	1,120	721	905	790	880	2,180	5,230	10,800	4,370	1,930	1,590
7	1,150	1,120	667	562	719	738	2,180	6,800	11,900	4,140	1,870	1,480
8	1,190	1,110	670	528	747	792	1,760	7,420	13,900	3,920	1,700	1,380
9	1,250	1,090	803	626	761	839	1,640	7,110	15,700	3,500	1,640	1,360
10	1,230	966	837	624	890	766	1,640	6,800	15,200	3,600	1,580	1,300
11	1,180	912	1,220	681	882	864	1,540	5,630	14,800	3,710	1,580	1,280
12	1,140	996	1,330	760	858	714	1,370	4,850	13,900	3,400	1,570	1,290
13	1,120	978	1,370	653	805	936	1,370	4,370	13,900	3,110	1,480	1,260
14	1,080	1,130	1,280	723	754	867	1,310	3,920	14,400	2,840	1,480	1,220
15	1,050	1,230	1,510	760	775	1,000	1,260	3,710	13,900	2,600	1,380	1,180
16	1,050	1,100	1,460	852	775	1,210	1,250	3,600	12,300	2,450	1,480	978
17	1,050	1,070	1,270	790	850	1,250	1,280	3,500	10,500	2,450	1,640	1,230
18	1,030	1,070	1,250	931	866	1,810	1,270	4,140	10,300	2,310	1,760	1,140
19	1,010	978	1,100	816	890	1,590	1,230	5,500	10,100	2,240	1,930	1,040
20	944	740	1,130	782	954	1,480	1,170	6,500	10,300	2,180	2,050	1,040
21	952	915	1,220	677	994	1,380	1,160	7,420	10,600	2,180	1,990	1,040
22	1,060	1,050	1,160	723	1,110	1,540	1,260	8,060	11,200	2,180	1,870	1,040
23	1,130	1,080	1,230	976	962	1,930	1,810	8,060	10,800	2,180	1,870	1,010
24	1,070	1,100	1,000	920	882	2,120	2,180	9,400	9,750	2,180	1,810	962
25	1,120	1,100	865	969	882	2,240	2,380	11,200	9,400	2,050	1,760	1,090
26	1,320	1,050	965	1,130	906	1,930	2,520	12,300	8,720	1,930	1,700	946
27	1,320	1,200	1,000	1,050	978	1,590	2,600	14,400	7,740	1,810	1,640	927
28	1,280	1,170	1,070	872	994	1,590	2,600	15,200	6,500	1,760	1,640	1,060
29	1,270	936	994	600	-------	1,430	2,680	15,700	5,910	2,180	1,540	1,080
30	1,220	952	994	749	-------	1,310	3,020	15,700	5,910	2,600	1,590	1,070
31	1,180	-------	988	626	-------	1,280	-------	15,200	-------	2,380	1,590	-------

NOTE.—Discharge Oct. 25, Nov. 10, 11, 14, 20, 21, 23, 24, 26-28, Dec. 5-10, 12-20, 22, Dec. 24 to Jan. 23, Mar. 6-15, Sept. 16, 27 computed by averaging the bi-hourly discharge. No gage-height record Oct. 30, 31, June 20-23, and Sept. 13, 14; discharge based on comparison with flow of Colorado River at Hot Sulphur Springs and Eagle River at Eagle.

Monthly discharge of Colorado River at Glenwood Springs, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,320	944	1,140	70,100
November	1,230	740	1,060	63,100
December	1,510	633	1,060	65,200
January	1,130	528	814	50,100
February	1,110	600	844	46,900
March	2,240	714	1,230	75,600
April	3,020	1,160	1,720	102,000
May	15,700	3,500	7,460	459,000
June	15,700	5,910	11,200	666,000
July	5,910	1,760	3,090	190,000
August	2,520	1,380	1,800	111,000
September	1,810	927	1,250	74,400
The year	15,700	528	2,720	1,970,000

COLORADO RIVER NEAR PALISADE, COLO.

LOCATION.—In sec. 2, T. 11 S., R. 98 W., at State bridge 2 miles above Palisade, Mesa County. Nearest important tributary, Plateau Creek, enters 6 miles above.

DRAINAGE AREA.—8,790 square miles (revised; measured on map of Colorado, scale 1 : 500,000).

RECORDS AVAILABLE.—April 9, 1902, to September 30, 1922.

GAGE.—Chain gage on downstream side of bridge near midspan; read by A. Barnhisel.

DISCHARGE MEASUREMENTS.—Made from bridge 2 miles below gage.

CHANNEL AND CONTROL.—Bed composed of gravel, silt, and scattered boulders. Control is at rapids 300 feet downstream; practically permanent. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 21.3 feet at 7 a. m. May 29 (discharge, 31,300 second-feet); minimum discharge occurred during winter.

ICE.—Stage-discharge relation affected by ice; data insufficient to warrant determination of discharge.

DIVERSIONS.—Between Palisade and Glenwood Springs stations, the principal diversion is the high-line canal of the Bureau of Reclamation which has a capacity of 1,425 second-feet. Of the amount diverted, power water is returned to the river to supply a priority of 521 second-feet for the Grand Valley Canal.

REGULATION.—None.

COOPERATION.—Complete records furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Colorado River near Palisade, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,940	2,000	2,000	-------	1,640	2,180	7,880	24,300	11,000	4,080	2,460
2	2,180	1,940	1,940	-------	1,580	2,120	8,330	21,900	10,900	4,080	2,390
3	2,180	1,940	1,880	-------	1,530	2,250	8,790	21,200	9,900	3,780	2,460
4	2,000	1,940	1,880	-------	1,530	2,320	9,420	20,800	8,640	3,880	2,780
5	1,940	2,000	1,820	-------	1,530	2,390	10,600	19,900	8,180	3,480	2,620
6	1,880	2,000	1,640	-------	1,530	2,460	12,900	21,000	8,180	3,300	2,390
7	1,940	2,000	1,480	-------	1,580	2,620	16,800	23,300	7,740	2,700	2,180
8	1,880	1,940	1,420	-------	1,580	2,780	18,600	25,800	7,160	2,540	1,880
9	1,940	1,880	1,530	-------	1,530	2,860	18,200	27,100	6,740	2,320	2,000
10	2,060	1,880	1,530	-------	1,530	2,780	15,600	27,400	6,600	2,250	1,940
11	2,120	1,940	1,880	-------	1,580	2,700	13,400	26,300	6,880	2,320	1,940
12	2,120	1,700	2,060	-------	1,640	2,540	11,500	24,300	6,470	2,250	1,880
13	2,060	1,700	2,180	-------	1,640	2,460	10,100	24,500	5,720	2,180	2,060
14	2,120	1,700	2,460	-------	1,700	2,120	9,420	25,300	5,250	2,060	1,940
15	2,000	2,060	2,620	-------	1,880	2,060	9,100	24,800	4,700	1,940	1,640
16	2,000	2,000	2,700	-------	2,540	2,120	9,100	23,000	4,500	1,880	1,580
17	2,000	1,900	2,180	1,480	2,320	2,000	9,580	19,500	4,180	1,940	1,580
18	2,000	1,820	1,940	1,530	2,460	2,000	11,200	19,000	4,080	2,540	1,480
19	1,940	1,800	2,000	1,580	2,700	1,940	13,600	18,800	3,880	2,780	1,280
20	1,880	1,760	2,060	1,640	2,700	1,880	16,400	19,200	3,580	2,860	1,320
21	1,940	1,680	2,180	1,480	2,940	1,940	17,800	19,200	3,480	2,940	1,370
22	1,880	1,880	2,250	1,530	2,860	2,320	18,600	19,000	3,390	2,860	1,280
23	1,880	1,940	2,060	1,370	2,940	3,210	19,000	18,000	3,480	2,780	1,230
24	1,940	2,060	1,940	1,420	3,030	3,980	20,300	17,400	3,120	2,700	1,150
25	2,060	2,180	1,580	1,480	3,120	4,700	22,600	16,000	2,860	2,460	1,150
26	2,120	2,180	1,640	1,700	2,780	5,140	25,000	14,700	2,540	2,320	1,280
27	2,120	2,250	1,640	1,640	2,700	5,480	27,400	14,100	2,540	2,250	1,230
28	2,120	2,320	1,700	-------	2,460	5,600	28,700	12,900	2,620	2,120	1,420
29	2,060	2,320	1,580	-------	2,390	6,210	31,000	11,500	2,460	2,180	1,640
30	2,000	2,060	1,570	-------	2,320	6,880	29,900	11,500	2,700	2,120	1,640
31	2,000	-------	1,570	-------	2,180	-------	27,400	-------	2,940	2,390	-------

NOTE.—Figures have been changed slightly to conform to computation rules of United States Geological Survey. Stage-discharge relation affected by ice Nov. 17–21 and Dec. 30 and 31; discharge determined by comparison with flow of Colorado River and Roaring Fork at Glenwood Springs.

Monthly discharge of Colorado River near Palisade, Colo., for the year ending September 30, 1922

Mean	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,180	1,880	2,010	124,000
November	2,320	1,680	1,960	117,000
December	2,700	1,420	1,900	117,000
March	3,120	1,530	2,140	132,000
April	6,880	1,880	3,070	183,000
May	31,000	7,880	16,400	1,010,000
June	27,400	11,500	20,400	1,210,000
July	11,000	2,460	5,370	330,000
August	4,080	1,880	2,650	163,000
September	2,780	1,150	1,770	105,000

NOTE.—Monthly means computed by engineers of the U. S. Geol. Survey.

COLORADO RIVER NEAR FRUITA, COLO.

LOCATION.—In sec. 20, T. 1 N., R. 2 W., at highway bridge 1½ miles south of Fruita, Mesa County. Nearest important tributary, Little Salt Wash, enters 1 mile below station; Gunnison River enters at Grand Junction 12 miles above.

DRAINAGE AREA.—16,800 square miles (measured on map in Hayden's atlas).

RECORDS AVAILABLE.—April 1, 1911, to September 30, 1922; flood records during 1908, 1909, 1910.

GAGE.—Chain gage on downstream side of left span; read by L. C. Jones. Prior to May 3, 1911, gage was vertical staff attached to center pier, datum 0.05 foot lower.

DISCHARGE MEASUREMENTS.—Made from three-span highway bridge.

CHANNEL AND CONTROL.—Bed composed of silt and gravel which will scour out at high stages and fill in afterwards. Control is riffle 600 feet downstream; somewhat shifting. Banks subject to overflow at stage of 14 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.5 feet at 5 p. m. May 29 (discharge, 54,100 second-feet); minimum stage probably occurred during winter.

1908–1922: Maximum stage recorded during period, 15.2 feet June 16, 1921 (discharge, 81,000 second-feet). Weather Bureau states that highest stage known was about 18.5 feet on July 4, 1884 (discharge, estimated from extension of rating curve and levels across overflow, 125,000 second-feet). Minimum stage, 1.9 feet August 26–30, 1919 (discharge, 1,270 second-feet).

ICE.—Stage-discharge relation seriously affected by ice; daily discharge not determined during winter.

DIVERSIONS.—Between the Palisade station and Fruita, court decrees for diversions of 788 second-feet from Colorado River.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice during winter. Rating curve fairly well defined. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table, except periods October 1 to January 9, March 7–31, and September 1–30, when shifting-control method was used. Records good.

Discharge measurements of Colorado River near Fruita, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Nov. 14	F. C. Snyder[a]	3.98	2,930	May 30	F. C. Snyder	12.24	41,500
Apr. 6	J. H. Baily[a]	5.05	5,900	July 5	J. H. Baily	6.80	11,400
May 13	F. C. Snyder	8.14	16,900				

[a] State hydrographer.

Daily discharge, in second-feet, of Colorado River near Fruita, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,730	3,370	3,460	3,370			4,290	19,400	43,200	14,700	4,860	3,040
2	2,880	3,370	3,720	3,370			3,910	20,000	35,800	13,700	4,860	3,040
3	2,880	3,370	3,720	3,370			3,910	21,300	33,100	13,300	5,060	3,370
4	2,960	3,370	3,370	3,540		2,600	4,670	23,300	33,100	12,400	5,270	3,720
5	2,880	3,200	3,120	3,200	2,200		5,060	24,000	34,000	11,200	4,670	3,370
6	2,880	3,370	2,880	3,040			5,920	31,400	32,200	9,710	4,480	3,200
7	3,040	3,370	3,040	3,040		2,660	6,850	39,500	36,700	9,380	4,290	3,200
8	2,880	3,370	3,040	3,040		2,580	7,100	42,300	39,500	8,450	3,540	3,040
9	2,880	3,460	2,880	3,040		2,580	6,380	39,500	42,300	8,450	3,540	2,730
10	3,040	3,370	2,880			2,580	5,270	32,200	41,400	8,160	2,880	2,730
11	3,040	3,040	2,880			2,730	4,670	27,200	41,400	7,880	2,880	2,580
12	3,200	3,200	3,040			2,580	4,480	20,000	37,600	7,880	2,880	2,580
13	3,200	3,370	3,200			2,730	4,290	17,700	36,700	7,100	2,880	2,440
14	3,040	3,280	3,200			2,800	3,720	17,200	38,600	6,380	2,880	2,440
15	3,040	3,280	3,040	2,400		3,040	4,290	16,600	37,600	6,150	2,880	2,300
16	2,960	3,630	3,040		2,250	3,460	4,860	16,200	34,000	5,700	2,300	2,300
17	3,040	3,370	3,040			4,580	5,480	16,200	28,800	5,480	3,540	2,300
18	3,040	3,540	3,200			5,700	4,100	21,300	27,200	5,060	3,200	2,300
19	3,040	3,370	3,120			4,380	3,910	26,400	27,200	4,860	3,720	2,300
20	3,040	3,370	3,120			3,910	3,910	29,600	26,400	4,670	4,290	2,170
21	3,040	3,370	3,280			4,100	3,910	34,900	26,400	4,670	4,670	1,980
22	2,960	3,540	3,720			4,290	5,480	34,900	25,600	4,480	4,290	1,980
23	2,880	3,540	4,000			4,760	6,850	35,800	24,000	4,480	4,480	1,980
24	2,960	3,370	3,820			6,150	7,880	39,500	22,600	4,290	4,290	1,980
25	3,040	3,540	3,200		2,800	5,700	9,710	45,200	22,600	4,290	3,720	1,860
26	3,200	3,720	3,370	2,250		5,480	12,400	47,100	21,300	4,290	3,540	1,980
27	3,370	3,720	3,540			5,270	12,000	49,100	18,800	3,540	3,200	2,100
28	3,370	3,540	3,540			4,860	11,200	51,100	17,700	3,370	3,200	1,980
29	3,370	3,540	3,370			4,580	13,300	53,100	16,600	3,540	3,040	1,980
30	3,370	3,370	3,370			4,290	16,600	51,100	15,700	4,480	3,200	1,980
31	3,370		3,370			4,380		49,100		4,860	3,540	

NOTE.—Stage-discharge relation affected by ice Jan. 10 to Mar. 6; discharge determined by comparison with combined flow of Colorado River near Palisade and Gunnison River near Grand Junction.

Monthly discharge of Colorado River near Fruita, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,370	2,730	3,050	188,000
November	3,720	3,040	3,410	203,000
December	4,000	2,880	3,280	202,000
January	3,540		2,590	159,000
February			2,390	133,000
March	6,150		3,730	229,000
April	16,600	3,720	6,550	390,000
May	53,100	16,200	32,000	1,970,000
June	43,200	15,700	30,600	1,820,000
July	14,700	3,370	7,000	430,000
August	5,270	2,300	3,740	230,000
September	3,720	1,860	2,500	149,000
The year	53,100	1,860	8,430	6,100,000

COLORADO RIVER AT LEES FERRY, ARIZ.

LOCATION.—At Lees Ferry, just above mouth of Paria River, at head of Marble Gorge and at lower end of Glen Canyon, Coconino County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 13, 1921, to September 30, 1922.

GAGE.—Staff gage in two sections on left bank, at head of Paria riffle and east end of the "Dugway" road; installed August 14, 1921; read by I. G. Cockroft and W. E. Johnson, resident hydrographers of the Southern California Edison Co.

Original gage installed temporarily on May 8, 1921, on right bank near buildings at Lees Ferry, about 400 feet upstream from the "Dugway" gage, was topped by the unusual flood of June, 1921, and damaged to such an extent that readings on it can not be reduced satisfactorily to the datum of the gage installed in its place on June 24 and known as "No. 1 gage." Stages through the crest of the flood from June 13–23 were recorded by use of stakes and referred to datum of No. 1 gage. The "Dugway" gage was read continuously and the No. 1 gage with some interruptions until June, 1922, when it was damaged by high water. Current-meter measurements were referred to both gages. The datum of the Dugway gage is 3,106.35 feet above sea level and that of the No. 1 gage is 3,102.79 feet above sea level.

DISCHARGE MEASUREMENTS.—Made from cable about 1 mile upstream from Dugway gage.

CHANNEL AND CONTROL.—Channel at measuring section varies in width from 350 feet at low water to 435 feet at high water. Bed is composed of sand and silt and is scoured several feet during each flood season. Control is Paria riffle; composed of gravel and boulders and has remained practically permanent during period of record.

EXTREMES OF DISCHARGE.—Maximum stage during flood season of 1921 occurred June 18 and was 26.5 feet referred to Dugway gage and 30.9 feet referred to No. 1 gage (discharge from extension of rating curves, about 190,000 second-feet). Maximum stage during the flood season of 1922 occurred June 2 and was 19.9 feet referred to Dugway gage (discharge, 120,000 second-feet).

Minimum stage during period June 13, 1921, to September 30, 1922, 6.4 feet January 14 and 15, 1922 (discharge, 3,700 second-feet).

The high-water mark of the flood of 1884 at the ranch near mouth of Paria River, as identified by Jerry Johnson, is at elevation 3,137.1 feet above sea level.

ICE.—Stage-discharge relation for a few days during winter of 1921–22 affected by diurnal collection of floating ice on Paria riffle.

DIVERSIONS.—Water is diverted from main river and tributaries above station for irrigation of about 1,500,000 acres.

REGULATION.—None.

ACCURACY.—Records for June 13 to September 30, 1921, are based on twice-daily readings referred to No. 1 gage and a rating curve developed from 119 current-meter measurements made between August, 1921, and June, 1922. The measurements cover a range in stage of 12 feet and a range in discharge from 5,000 to 98,500 second-feet. The records for the year ending September 30, 1922, are based on twice-daily readings and two rating curves referred to the "Dugway gage." During the year 158 current-meter measurements, covering a range in stage of 13 feet and a range in discharge from 3,700 to 116,000 second-feet, were referred to this gage. The low-stage measurements made after July 11, 1922, indicated a scour in the control corresponding to about 0.1 foot on gage and a new curve was drawn and

used for the fall and winter of 1922. Records good except those for high water of 1921 which may be subject to some error.

COOPERATION.—All equipment except current meters was furnished and installed by the Southern California Edison Co., through H. W. Dennis, construction engineer, and the entire cost of operation was borne by that company. The Geological Survey acted in an advisory capacity, furnished the current-meter equipment, and made the studies and computations of results.

Daily discharge, in second-feet, of Colorado River at Lees Ferry, Ariz., for the years ending September 30, 1921 and 1922

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1921					1921				
1		62,700	29,600	23,800	16	169,000	29,300	19,400	9,630
2		58,900	37,000	25,200	17	175,000	28,100	16,000	9,440
3		55,600	29,600	22,500	18	181,000	32,000	20,400	8,500
4		51,900	26,600	21,800	19	172,000	31,600	17,500	8,680
5		50,500	23,500	21,100	20	156,000	31,200	15,600	8,150
6		48,200	20,700	20,100	21	137,000	32,000	24,500	8,150
7		45,500	19,400	18,100	22	119,000	28,900	26,200	7,980
8		41,100	18,800	16,200	23	106,000	29,600	40,200	7,980
9		36,000	17,500	15,100	24	91,300	28,500	48,200	7,980
10		33,200	16,600	14,200	25	82,000	27,700	64,100	7,640
11		30,800	16,200	12,800	26	77,800	26,600	51,900	7,810
12		29,600	16,600	12,100	27	75,200	26,600	46,000	7,640
13	138,000	29,300	16,600	11,600	28	73,700	27,700	35,200	7,310
14	150,000	28,100	14,800	10,900	29	75,700	33,200	30,000	7,150
15	161,000	28,500	15,400	10,000	30	66,500	26,200	27,700	6,830
					31		25,500	25,200	

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1921–22												
1	7,120	6,780	7,650	8,580	5,150	9,600	17,200	42,500	118,000	52,100	11,900	8,550
2	11,800	6,780	7,470	8,390	5,150	9,390	16,000	46,600	119,000	48,800	12,100	8,740
3	7,830	6,780	7,470	8,200	5,020	9,390	14,500	53,200	107,000	46,100	12,400	8,740
4	7,470	6,780	7,300	8,580	5,150	8,580	13,500	55,400	95,700	44,000	13,400	10,800
5	6,780	6,950	7,120	10,000	5,280	7,650	13,000	55,400	86,200	42,500	14,900	11,700
6	6,950	7,120	7,120	8,980	5,020	7,300	14,000	61,000	81,200	36,600	14,100	9,930
7	6,950	7,300	7,120	8,980	5,280	7,120	16,500	62,700	81,200	34,800	12,400	8,930
8	7,120	7,300	7,470	8,390	5,020	6,780	17,800	71,700	84,500	32,900	11,900	8,930
9	6,780	7,120	6,950	7,300	4,900	6,780	18,800	81,200	88,500	31,200	11,700	9,120
10	6,780	7,120	6,450	6,620	5,020	6,620	18,100	86,800	93,500	28,200	11,000	8,550
11	6,780	7,120	5,830	5,280	6,450	6,290	17,800	85,100	104,000	27,000	9,930	8,180
12	6,780	7,120	5,830	4,430	10,900	6,130	17,800	81,200	108,000	25,000	10,600	7,820
13	6,950	6,950	5,550	3,900	10,000	6,130	18,100	72,800	108,000	23,100	9,120	7,300
14	7,120	6,950	5,280	3,700	9,600	6,130	17,500	65,500	102,000	22,400	8,930	6,960
15	6,780	6,780	5,020	3,700	10,200	6,290	16,800	61,000	99,700	21,300	8,740	6,640
16	6,780	6,450	5,020	4,110	9,810	6,780	15,700	56,500	99,100	19,300	8,180	6,480
17	6,450	6,450	5,150	4,110	8,390	10,000	14,800	54,300	97,400	18,400	8,180	6,320
18	6,450	6,780	5,420	4,320	7,650	16,800	14,000	51,500	87,900	16,800	8,550	6,170
19	6,130	6,780	5,980	4,540	7,650	22,600	14,300	50,400	79,500	15,400	8,550	5,720
20	6,290	6,950	6,130	4,540	7,830	24,500	14,000	55,400	75,600	14,600	11,500	5,580
21	6,450	6,950	6,450	4,900	8,780	31,200	13,500	63,800	75,600	13,800	11,000	5,580
22	6,130	6,950	7,300	4,430	10,200	31,200	12,500	70,000	75,000	13,100	11,700	5,300
23	6,130	7,120	7,470	4,220	10,200	24,500	13,500	77,300	75,000	12,800	12,400	5,300
24	6,130	6,950	8,020	4,000	10,700	21,200	17,500	82,300	72,200	11,900	12,400	5,170
25	6,130	6,620	8,580	4,110	10,700	21,900	24,900	86,800	71,700	11,200	19,300	5,040
26	6,780	6,620	9,810	4,430	10,500	21,200	30,700	94,600	68,900	10,800	17,800	5,040
27	7,120	7,120	10,500	4,900	10,000	23,700	32,900	99,100	65,500	10,400	12,600	4,920
28	7,650	7,470	11,800	4,770	9,810	24,500	36,200	106,000	61,600	10,400	11,000	4,920
29	7,650	7,470	10,700	4,430		24,500	40,000	113,000	57,100	10,100	10,400	4,790
30	6,780	7,650	9,180	4,430		22,200	42,000	117,000	55,400	9,930	9,320	4,790
31	6,450		8,780	4,660		19,400		119,000		10,100	8,930	

Monthly discharge of Colorado River at Lees Ferry, Ariz., for the years ending September 30, 1921 and 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1921				
June 13–30	181,000	66,500	123,000	4,390,000
July	62,700	25,500	35,300	2,170,000
August	64,100	14,800	26,700	1,640,000
September	25,200	6,830	12,500	744,000
The period				8,940,000
1921–22				
October	11,800	6,130	6,950	427,000
November	7,650	6,450	6,980	415,000
December	11,800	5,020	7,290	448,000
January	10,000	3,700	5,680	349,000
February	10,900	4,900	7,870	437,000
March	31,200	6,130	14,700	904,000
April	42,000	12,500	19,500	1,160,000
May	119,000	42,500	73,500	4,520,000
June	119,000	55,400	86,500	5,150,000
July	52,100	9,930	23,400	1,440,000
August	19,300	8,180	11,400	701,000
September	11,700	4,790	7,070	421,000
The year	119,000	3,700	22,600	16,400,000

COLORADO RIVER NEAR TOPOCK, ARIZ.

LOCATION.—In E. ½ sec. 16, T. 7 N., R. 24 E., in Mohave Canyon 1¾ miles below Atchison, Topeka & Santa Fe Railway bridge at Topock, Mohave County.

DRAINAGE AREA.—171,000 square miles.

RECORDS AVAILABLE.—February 1, 1917, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder on right bank at mouth of Mohave Wash just above point where river enters a narrow section of the canyon; inspected by G. M. Bobst and D. A. Dudley. Zero of gage 424.09 feet above sea level.

DISCHARGE MEASUREMENTS.—Made from cable 500 feet below gage.

CHANNEL AND CONTROL.—Channel straight above and below gage. Above the gage the channel is wide and the bed of loose sand is constantly shifting. At low stages large sand bars form numerous islands between Topock and the gage. Below gage river enters a steep walled rock canyon and the channel contracts from about 800 to 400 feet. The bed in the canyon scours during floods and fills during low stages. The control is indefinite.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 20.75 feet on June 3 (discharge, 121,000 second-feet); minimum discharge, 6,360 second-feet on September 28.

1917–1922: Maximum stage recorded, 28.2 feet at 6 a. m. June 22, 1921 (discharge, 174,000 second-feet); minimum discharge, 4,100 second-feet on January 16, 1919.

DIVERSIONS.—Water is diverted from main river and tributaries above station for irrigation of about 1,500,000 acres.

ACCURACY.—Stage-discharge relation not permanent. During the year 67 discharge measurements were made covering a range in discharge from 6,500 to 120,000 second-feet. Operation of water-stage recorder satisfactory during most of year. Mean daily gage heights determined by inspecting recorder graph. Daily discharge ascertained by shifting-control method. Records for October to April, fair; May to September, good.

Daily discharge, in second-feet, of Colorado River near Topock, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10,000	9,600	8,600	15,700	8,000	13,300	33,200	39,000	115,000	66,600	12,100	11,500
2	9,600	10,500	8,700	16,800	8,000	13,500	29,000	43,000	115,000	60,400	13,900	11,500
3	9,200	10,200	8,700	18,000	7,800	14,000	19,100	46,000	121,000	59,600	13,000	13,700
4	9,900	9,800	9,000	19,200	7,700	13,500	18,300	50,000	119,000	56,400	14,600	11,300
5	12,000	9,800	9,000	18,000	7,680	14,300	17,500	53,000	116,000	54,200	18,800	11,000
6	14,500	10,000	9,200	16,700	7,800	14,000	17,000	53,000	106,000	51,000	17,800	11,800
7	9,900	9,900	9,400	15,500	7,850	13,100	17,000	56,000	99,500	46,500	16,000	11,800
8	8,500	10,000	9,400	14,200	7,800	12,900	17,000	60,000	97,000	42,900	15,100	14,000
9	8,740	10,000	9,400	13,000	7,700	11,800	17,000	66,000	91,200	38,600	18,000	15,000
10	8,740	9,900	9,300	12,400	8,000	11,700	20,600	73,000	91,800	35,800	16,800	12,500
11	8,500	10,100	9,300	13,800	8,100	11,300	22,200	82,600	90,700	35,400	13,600	10,000
12	9,000	10,100	9,500	12,400	11,800	11,300	23,000	86,000	93,400	32,200	13,000	10,600
13	8,500	10,200	9,500	11,300	10,300	11,200	22,800	86,800	94,000	30,600	13,000	9,810
14	8,200	10,200	9,600	10,200	9,700	11,000	21,900	86,000	97,200	28,200	12,500	9,810
15	8,200	9,900	9,600	9,160	13,900	11,000	22,200	81,700	99,300	26,800	11,000	9,000
16	7,600	9,900	9,500	8,490	19,000	11,000	23,600	73,500	100,000	25,600	13,000	8,300
17	8,500	9,900	9,400	7,820	17,400	11,000	23,300	67,800	99,700	24,900	12,600	7,700
18	9,400	9,900	9,300	7,150	17,100	11,300	22,200	59,200	96,000	23,500	11,000	7,700
19	9,000	9,280	9,400	7,150	16,700	11,500	22,200	58,300	98,000	21,800	11,400	7,500
20	8,600	8,900	9,400	7,150	13,500	12,800	19,600	58,400	98,000	21,100	19,500	7,400
21	9,000	8,500	9,500	7,140	12,200	14,000	17,000	60,100	92,000	19,400	20,000	7,430
22	8,000	8,500	11,300	7,140	11,000	38,000	18,000	62,100	87,000	24,200	15,500	7,430
23	8,200	8,600	19,500	7,120	10,500	36,700	19,000	69,400	80,000	23,100	14,800	7,430
24	8,960	8,400	19,500	7,100	10,700	35,800	20,000	74,800	80,300	15,500	15,500	7,000
25	8,800	8,200	17,300	7,250	12,000	35,000	20,500	79,200	80,500	14,900	13,800	6,900
26	9,500	8,100	13,000	7,400	13,000	34,100	21,000	88,000	83,000	14,600	15,600	6,800
27	10,000	8,330	11,000	7,550	12,500	30,500	27,000	92,000	79,300	14,200	15,200	6,600
28	8,950	8,500	10,500	7,700	13,000	28,500	33,000	96,800	75,000	13,600	16,500	6,360
29	8,700	8,600	9,500	7,850	-------	28,500	34,000	101,000	72,000	12,100	23,000	6,400
30	9,000	8,600	10,000	7,700	-------	31,000	36,000	108,000	70,000	11,200	17,500	6,400
31	9,800	-------	14,500	7,900	-------	32,800	-------	112,000	-------	11,500	13,000	-------

Monthly discharge of Colorado River near Topock, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14,500	7,600	9,210	566,000
November	10,500	8,100	9,410	560,000
December	19,500	8,600	10,700	658,000
January	19,200	7,100	10,800	664,000
February	19,000	7,680	11,100	616,000
March	38,000	11,000	19,000	1,170,000
April	36,000	17,000	22,500	1,340,000
May	112,000	39,000	71,700	4,410,000
June	121,000	70,000	94,600	5,630,000
July	66,600	11,200	30,900	1,900,000
August	23,000	11,000	15,100	928,000
September	15,000	6,360	9,360	557,000
The year	121,000	6,360	26,200	19,000,000

COLORADO RIVER AT YUMA, ARIZ.

LOCATION.—In NE. ¼ NE. ¼ sec. 35, T. 16 S., R. 22 E., San Bernardino base and meridian, 100 feet upstream from Southern Pacific Co.'s original railroad bridge at Yuma, Yuma County, and half a mile below highway bridge. Since change in channel on June 7, 1920, Gila River enters from east 5 miles upstream from this station.

DRAINAGE AREA.—242,000 square miles (measured on map compiled from best available maps of the Colorado River basin).

RECORDS AVAILABLE.—April 1, 1878, to September 30, 1921. Gage heights only prior to January 1, 1902.

GAGE.—Stevens long-distance water-stage recorder installed May 1, 1922. Sender in stilling well on left bank at same point and datum as vertical staff gage formerly used. Continuous recorder in office of Bureau of Reclamation. Sender and recorder inspected daily by D. Martinez. Zero of gage is 102.79 feet above mean sea level.

DISCHARGE MEASUREMENTS.—Made from cable 1,100 feet downstream from gage.

CHANNEL AND CONTROL.—Bed composed of shifting sand and silt; subject to much scour during high water. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge during year, 115,000 second-feet on June 10; minimum mean daily discharge, 4,200 second-feet on January 31.

1902–1922: Maximum mean daily discharge, 240,000 second-feet January 22, 1916; minimum mean daily discharge, 1,800 second-feet January 16, 1919.

DIVERSIONS.—Water is diverted for irrigation and power from main river and tributaries above this station. The Yuma project of the United States Bureau of Reclamation diverts from right side of river at Laguna dam 15 miles upstream and siphons under the river at Yuma between gage and cable. Waste water from diversion returns to river on right side half a mile below cable. Imperial irrigation district diverts from river on right side 7 miles downstream from this station.

REGULATION.—Flow affected at times by sluicing at Laguna dam.

ACCURACY.—During the year 157 discharge measurements were made at the station; daily discharge determined by shifting-control method.

COOPERATION.—Complete records furnished by United States Bureau of Reclamation, but data have been slightly revised to conform to computation rules used by the United States Geological Survey.

Daily discharge, in second-feet, of Colorado River at Yuma, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17,300	7,100	7,400	18,000	5,100	13,800	28,500	32,300	83,500	74,500	10,300	16,700
2	11,800	7,200	7,300	17,000	4,500	13,000	28,000	33,200	91,500	69,500	9,200	14,800
3	11,100	7,300	7,800	16,400	7,500	13,100	27,000	34,100	97,000	64,500	11,100	13,800
4	11,000	7,400	7,100	20,000	7,800	12,500	23,500	37,000	100,000	59,500	11,200	12,500
5	10,900	7,800	7,600	40,600	7,500	11,800	20,700	39,000	104,000	58,500	11,500	12,100
6	10,200	7,200	7,900	46,800	7,100	11,600	19,000	43,700	107,000	52,500	12,600	12,500
7	9,500	6,600	7,800	24,000	6,800	10,200	17,700	47,000	109,000	47,500	13,200	10,700
8	16,000	7,000	7,900	19,000	6,600	9,600	17,700	49,900	112,000	47,000	12,700	10,300
9	12,000	7,400	7,900	16,600	6,500	9,700	16,500	50,000	114,000	43,000	12,200	9,000
10	9,700	7,700	7,900	16,100	6,500	9,700	15,100	52,200	115,000	39,000	13,200	10,100
11	9,200	8,100	8,700	15,700	6,700	9,000	16,500	53,500	107,000	35,500	13,700	11,500
12	8,900	8,300	8,500	14,100	13,500	8,500	17,900	56,600	98,200	32,200	13,900	10,700
13	8,600	8,500	8,400	13,900	17,000	7,700	20,200	61,300	88,000	30,000	14,100	10,000
14	8,800	9,000	8,300	13,300	17,600	7,800	20,700	56,000	84,000	29,000	10,600	8,600
15	8,500	8,800	8,400	10,500	15,400	7,800	20,500	59,400	87,300	29,500	10,500	8,200
16	8,200	8,700	8,500	10,500	11,700	7,500	18,500	66,000	92,000	26,200	10,500	8,300
17	7,600	8,000	6,300	9,400	11,800	7,200	18,300	71,300	100,000	22,200	10,000	7,600
18	7,300	7,600	6,200	8,300	17,000	8,500	18,700	76,000	105,000	22,000	9,800	7,300
19	7,000	7,400	6,100	7,000	14,500	9,500	19,100	73,000	110,000	21,700	9,000	6,800
20	7,100	7,300	6,000	6,400	14,000	24,400	18,000	69,000	110,000	18,800	8,500	6,300
21	7,100	7,000	5,900	5,700	13,600	19,000	16,800	63,000	110,000	19,500	8,000	6,200
22	7,500	7,100	7,000	5,500	12,500	16,100	16,000	58,200	108,000	18,000	10,500	6,200
23	7,200	6,700	5,900	5,700	11,000	23,200	15,500	55,000	108,000	16,800	17,800	5,900
24	7,900	6,900	19,500	5,500	10,100	28,800	15,800	51,100	104,000	15,500	14,100	5,700
25	6,300	7,100	25,500	5,200	11,000	31,200	15,200	53,000	98,000	15,000	11,100	5,500
26	6,500	7,200	20,500	6,000	12,000	35,000	14,600	54,800	87,000	13,500	15,200	5,400
27	6,600	7,200	13,000	5,900	12,600	30,900	13,800	61,000	76,500	11,700	14,900	6,700
28	6,700	7,300	11,200	6,500	13,700	27,000	13,300	64,000	77,000	12,100	13,400	5,800
29	7,400	7,400	14,800	5,000	-------	26,500	20,000	65,000	74,500	13,500	13,200	4,500
30	7,100	7,500	23,100	4,600	-------	26,200	30,500	72,000	74,000	10,500	13,100	4,700
31	7,000	-------	22,300	4,200	-------	26,000	-------	75,100	-------	12,000	15,000	-------

Monthly discharge of Colorado River at Yuma, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	17,300	6,300	8,970	552,000
November	9,000	6,600	7,530	448,000
December	25,500	5,900	10,300	633,000
January	46,800	4,200	13,000	799,000
February	17,600	4,500	10,800	600,000
March	35,000	7,200	16,200	996,000
April	30,500	13,300	19,100	1,140,000
May	76,000	32,300	55,900	3,440,000
June	115,000	74,000	97,700	5,810,000
July	74,500	10,500	31,600	1,940,000
August	17,800	8,000	12,100	744,000
September	16,700	4,500	8,810	524,000
The year	115,000	4,200	24,400	17,600,000

FRASER RIVER NEAR ARROW, COLO.

LOCATION.—In NE. ¼ sec. 4, T. 2 S., R. 75 W., a quarter of a mile from Vasquez siding on Denver & Salt Lake Railroad in Arapahoe National Forest and 1½ miles southwest of Arrow, Grand County. Nearest tributary enters about half a mile above.

DRAINAGE AREA.—28 square miles (revised, measured on topographic map).

RECORDS AVAILABLE.—September 23, 1910, to September 30, 1922.

GAGE.—Friez water-stage recorder on left bank 300 feet upstream from old logging road crossing at Vasquez; inspected by forest ranger. Prior to June 3, 1916, vertical staff attached to downstream side of bridge on trail to Arrow and a quarter of a mile above railroad bridge was used. During winter, readings taken from staff gage 1 mile upstream at railroad bridge.

DISCHARGE MEASUREMENTS.—Made from footbridge near gage or by wading

CHANNEL AND CONTROL.—Bed composed of boulders and coarse gravel; fairly permanent. No well-defined control. Banks are not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 2.03 feet at 8 p. m. June 13 (discharge, 336 second-feet); minimum discharge occurred during winter.

1911–1922: Maximum discharge recorded, 820 second-feet at 9 p. m. June 13, 1918 (gage height, 2.9 feet); minimum discharge, 2 second-feet on March 30, 1912 (gage-height, 0.60 foot).

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Court decrees for diversions of 53 second-feet across divide from headwaters of Fraser River into headwaters of Clear Creek. During 1922, 577 acre-feet were diverted. Below station, court decrees for 74 second-feet for irrigation and 61 second-feet for placer mining and power.

REGULATION.—Diurnal fluctuation during spring, caused by alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation practically permanent for both regular and winter stations; affected by ice. Rating curve used October 1 to October 26 and June 5 to September 30, and curve for winter station used October 27 to June 4 are both well defined. Staff gage at winter station read to quarter-tenths once daily. Operation of water-stage recorder satisfactory except for short periods. Daily discharge ascertained by applying to rating tables daily gage height or mean daily gage height determined by inspection of recorder graph. Record excellent, except for days of missing gage heights and periods affected by ice, for which they are fair.

Discharge measurements of Fraser River near Arrow, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Dec. 21	J. C. McCallister	[a] 0.62	7.8
Feb. 8	do	[a] .58	7.1
July 6	Arthur and McCallister	.92	65

[a] Made at winter station.

Daily discharge, in second-feet, of Fraser River near Arrow, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	23	13	6	6	6	3	14	169	90	31	25
2	18	21	13	7	6	6	3	21	169	77	33	26
3	17	18	13	6	6	6	3	21	169	70	30	25
4	17	17	12		6	6	8	18	160	69	30	24
5	16	18	11		6	6	3	48	185	67	30	24
6	16	20	13		8	6	7	48	180	74	26	23
7	19	23	13	5	7	3	7	54	200	65	25	22
8	18	13	15		7	3	8	65	221	60	24	20
9	18	12	12		8	6	6	59	232	58	24	18
10	16	11	10		8	6	8	43	232	55	23	17
11	16	13	11		8	3	8	38	224	52	24	17
12	16	18	12		8	3	3	25	229	50	22	16
13	16	16	13		8	3	6	23	267	47	22	16
14	16	15	10		7	6	6	21	252	46	22	16
15	15	13	7	6	6	6	7	21	210	45	23	16
16	14	13	4		6	6	8	21	180	43	23	16
17	14	10	5		6	6	7	59	166	41	24	15
18	14	9	6		6	6	6	59	163	37	30	15
19	14	8	7		6	8	6	71	156	36	28	14
20	14	10	8		6	8	6	92	158	36	27	14
21	14	12	8		6	8	4	85	150	40	30	14
22	14	15	7		6	6	8	116	139	37	33	14
23	14	11	7		6	3	8	169	135	36	33	14
24	15	15	6		6	3	8	142	131	35	31	14
25	15	9	7		6	6	8	188	125	34	32	14
26	17	17	7	7	6	3	8	208	115	32	31	13
27	21	20	7		6	7	8	219	104	33	28	13
28	21	23	7		6	6	8	230	97	36	27	14
29	15	15	7		-------	3	8	230	95	37	30	14
30	15	12	7		-------	3	8	188	97	30	29	14
31	17	-------	6		-------	8	-------	178	-------	28	26	-------

NOTE.—Stage-discharge relation affected by ice Nov. 9–11, 13, 17–21, Dec. 9–21, 23–25, 29, Jan. 4 to Feb. 5, 14, 19–28, Apr. 7, 17; discharge based on temperature and gage-height records, two discharge measurements, and observer's notes. No gage-height record July 9–12, Aug. 13–16, and Sept. 29–30; discharge interpolated. Braced figures show mean discharge for periods indicated.

Monthly discharge of Fraser River near Arrow, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	21	14	16.2	996
November	23	8	15.0	893
December	15	4	9.2	566
January			6.2	381
February	8	6	6.5	361
March	8	3	5.3	326
April	8	3	6.5	387
May	230	14	89.5	5,500
June	267	95	170	10,100
July	90	28	48.3	2,970
August	33	22	27.5	1,690
September	26	13	17.2	1,020
The year	267	3	34.8	25,200

WILLIAMS FORK NEAR PARSHALL, COLO.

LOCATION.—About sec. 36, T. 1 N., R. 79 W., at private bridge at Field ranch, 4 miles above mouth of river, and 4 miles south of Parshall, Grand County. Nearest tributary, Battle Creek, enters from west 2 miles below station.

DRAINAGE AREA.—185 square miles (measured on Forest Service atlas).

RECORDS AVAILABLE.—July 25, 1904, to September 30, 1922.

GAGE.—Bristol float type water-stage recorder at left end of bridge installed October 18, 1919, and referred to vertical staff on downstream side of bridge pier; inspected by F. A. Field.

DISCHARGE MEASUREMENTS.—Made from two-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders; shifts. Control is gravel bar 50 feet downstream; slightly shifting at long intervals. Water flows through small overflow channels at and above stage of 4.1 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.2 feet at 3 a. m. June 14 (discharge, 820 second-feet); minimum discharge occurred during winter.

1904–1922: Maximum stage recorded, 6.0 feet at 9.45 a. m. June 14, 1918 (discharge, 2,520 second-feet); minimum stage, 2.1 feet on November 7, 1919 (discharge, 15 second-feet).

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Court decrees for diversions of 1,416 second-feet from Williams Fork, all above station. Of this amount 700 second-feet are to be diverted to the eastern slope, but this diversion has not been made.

REGULATION.—Diurnal fluctuation during spring, caused by alternate melting and freezing of mountain snow.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice during winter. Rating curve well defined. Operation of water-stage recorder satisfactory except period December 9 to April 18, when staff gage was read to hundredths twice daily. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspection of recorder graph and from two daily gage height readings. Records excellent except for periods affected by ice, for which they are fair.

Discharge measurements of Williams Fork near Parshall, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 20	Hodges and McCallister	2.60	61	Apr. 25	Robert Follansbee	2.90	106
Feb. 9	J. C. McCallister	* 2.63	46	May 27	do	3.90	575
				July 6	M. B. Arthur	3.43	274

* Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Williams Fork near Parshall, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	81	72	51		38	51	155	548	316	128	89
2	86	81	63	50			52	142	548	285	173	84
3	86	81	63	45	34		63	167	540	260	124	82
4	84	81	66				74	176	472	252	113	77
5	82	82	70			38	77	210	508	248	109	68
6	81	81	58				88	300	564	290	100	66
7	95	76	58				81	316	628	270	89	66
8	100	71	64		36	40	71	290	700	220	84	64
9	95	81	65			51	71	290	740	206	72	57
10	88	79	66	43		61	63	240	740	236	69	54
11	84	79	69			45	63	196	700	313	74	54
12	79	69	77			50	61	167	700	192	69	55
13	82	74	71		40	44	52	152	740	176	71	54
14	82	72	66			48	42	148	740	158	77	50
15	79	64	55			39	68	142	740	138	88	55
16	77	60	51		40	41	54	132	660	138	86	51
17	79	64	47		40	42	54	155	644	135	91	54
18	77	64	46	32	38	50	57	232	628	126	135	52
19	77	61	50		38	45	58	248	604	113	120	51
20	79	58	58		36	45	48	280	612	115	113	51
21	79	58	57		35	41	63	340	596	120	105	51
22	77	66	57		37	50	96	295	580	117	104	51
23	77	71	58		37	64	113	346	524	102	100	50
24	82	71	52		41	60	120	418	524	100	95	52
25	91	77	40		38	64	115	516	465	89	100	52
26	91	63	54	35	38	54	113	564	472	86	82	48
27	88	60	57		39	60	111	644	430	86	79	52
28	93	69	58		37	54	95	628	382	98	81	64
29	89	71	55		-------	47	115	652	358	132	76	66
30	81	76	55		-------	45	138	660	370	100	93	61
31	76	-------	54		-------	39	-------	596	-------	95	86	-------

NOTE.—Stage-discharge relation affected by ice Dec. 5–11, 16–19, 24–26, Jan. 4 to Feb. 18, Mar. 2–7; discharge based on temperature and gage-height record, two discharge measurements, and observer's notes. Braced figures show mean discharge for periods indicated.

Monthly discharge of Williams Fork near Parshall, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	100	76	83.7	5,150
November	82	58	71.4	4,250
December	77	46	59.4	3,650
January			38.9	2,390
February			37.3	2,070
March	64		46.6	2,870
April	138	42	77.6	4,620
May	660	132	316	19,400
June	740	368	582	34,600
July	316	86	171	10,500
August	173	69	96.3	5,920
September	89	48	59.4	3,530
The year	740		137	99,000

TROUBLESOME CREEK NEAR TROUBLESOME, COLO.

LOCATION.—In sec. 12, T. 1 N., R. 80 W., at highway bridge 1 mile north of Troublesome, Grand County. No tributary between station and mouth, 1½ miles below.

DRAINAGE AREA.—172 square miles (measured on base map of Colorado, scale 1: 500,000).

RECORDS AVAILABLE.—April 26 to September 30, 1922. From July 22, 1904, to October 31, 1905, station maintained at practically same site.

GAGE.—Vertical staff fastened to piling near downstream side of left abutment; read by A. E. Ladwig.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading nearby.

CHANNEL AND CONTROL.—Bed composed of mud and gravel, probably shifting; control at gravel bar 75 feet downstream, which was permanent during year.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.70 feet at 6.30 a. m. May 26 and 27 (discharge, 350 second-feet); minimum stage, 1.28 feet at 5.30 p. m. July 20 (discharge, 1 second-foot).

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Court decrees for diversion of 470 second-feet from Troublesome Creek, all above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of Troublesome Creek near Troublesome, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Apr. 26	Robert Follansbee	2.11	116
May 27	do	2.61	300
June 19	do	1.76	48.6

Daily discharge, in second-feet, of Troublesome Creek near Troublesome, Colo., for the period April 26 to September 30, 1922

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		158	230	11	25	30	16		140	85	2	36	18
2		152	214	11	43	26	17		140	74	2	36	17
3		167	198	9	38	25	18		198	68	2	38	16
4		174	170	12	36	23	19		226	53	1	38	16
5		178	155	7	36	20	20		226	44	1	36	16
6		238	149	7	34	18	21		246	23	1	39	15
7		275	152	10	33	18	22		238	20	3	31	16
8		260	149	5	34	19	23		260	19	5	28	16
9		260	146	4	34	18	24		280	15	4	26	16
10		230	140	6	33	16	25		310	15	2	26	16
11		206	128	7	43	16	26	115	335	10	1	25	16
12		186	111	4	38	17	27	115	325	5	1	23	15
13		167	100	3	34	16	28	118	320	4	8	19	16
14		152	100	2	36	18	29	132	310	7	19	18	16
15		138	89	2	33	17	30	149	290	18	17	26	18
							31		285		19	23	

Monthly discharge of Troublesome Creek near Troublesome, Colo., for the period April 26 to September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 26–30	149	115	126	1,250
May	335	138	228	14,000
June	230	4	89.7	5,340
July	19	1	6.1	375
August	43	18	32.2	1,980
September	30	15	18.0	1,070
The period				24,000

BLUE RIVER AT DILLON, COLO.

LOCATION.—In sec. 18, T. 5 S., R. 77 W., at highway bridge on edge of Dillon, Summit County. Nearest tributaries, Snake River and Tenmile Creek, enter a short distance below.

DRAINAGE AREA.—129 square miles (revised).

RECORDS AVAILABLE.—October 15, 1910, to September 30, 1922.

GAGE.—Gurley water-stage recorder installed April 21, 1920, referred to vertical staff on right abutment of bridge, inspected by Forest Service ranger.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of compact gravel upon which lodges débris from hydraulic dredges near Breckenridge. Control is riffle 50 feet downstream; shifts at intervals. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 2.9 feet at 6 a. m. June 9 (discharge, 486 second-feet); minimum discharge occurred during winter.

1911–1922: Maximum stage recorded, 4.35 feet June 2, 1914 (discharge, 1,180 second-feet); minimum discharge, 14 second-feet on January 30 and February 9, 1915.

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Court decrees for diversion of 2.3 second-feet for irrigation from Blue River above station and 63 second-feet below; also placer decrees for diversion of 118 second-feet near Breckenbridge. There is a small unadjudicated diversion from the headwaters of the Blue, across Boreas Pass to Tarryall Creek.

REGULATION.—Diurnal fluctuation during spring, caused by alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspection of recorder graph. Records excellent, except for periods of missing gage heights, for which they are fair.

Discharge measurements of Blue River at Dillon, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 18	J. B. Spiegel	1.43	68	June 19	Robert Follansbee	2.58	343
May 1	Robert Follansbee	1.58	89	Sept. 13	M. B. Arthur	1.40	70
26	do	2.61	372				

Daily discharge, in second-feet, of Blue River at Dillon, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	77	61	46	91	341	239	146	88
2	76	61	50	103	305	236	184	86
3	77	61	54	109	305	218	209	83
4	76	61	60	114	298	204	164	83
5	75	61	62	127	287	201	151	82
6	75	61	65	151	320	198	138	82
7	75	61	56	189	361	198	131	81
8	75	60	51	195	422	182	121	78
9	81	57	50	186	460	172	114	76
10	77	54	49	174	443	198	111	72
11	77	54	45	146	404	206	116	71
12	77	55	46	131	409	172	109	69
13	75	54	46	123	417	160	104	67
14	72	54	48	120	447	140	102	67
15	71	54	48	116	422	136	103	66
16	71	54	49	114	374	374	103	65
17	74	------	49	109	341	134	103	64
18	71	------	49	118	336	127	103	64
19	65	------	49	146	345	121	103	63
20	65	------	48	162	345	118	104	62
21	65	------	51	176	336	118	111	62
22	65	------	56	204	336	120	108	61
23	63	------	62	212	320	116	109	61
24	64	------	68	251	312	108	106	60
25	64	------	70	298	294	103	102	60
26	63	------	72	353	284	98	97	60
27	61	------	72	400	280	98	92	60
28	61	------	71	387	258	103	90	60
29	61	------	76	396	242	120	87	60
30	61	------	83	430	245	164	86	61
31	61	------	------	400	------	140	91	------

NOTE.—No gage-height record Apr. 1–7, 23, and Sept. 18–20; discharge interpolated. No record Nov. 17 to Mar. 31.

Monthly discharge of Blue River at Dillon, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	81	61	70.0	4,300
November 1-16	61	54	57.7	1,830
April	83	45	56.7	3,370
May	430	91	201	12,400
June	460	242	343	20,400
July	239	98	154	9,470
August	209	86	116	7,130
September	88	60	69.1	4,110

EAGLE RIVER AT REDCLIFF, COLO.

LOCATION.—In sec. 29, T. 6 S., R. 80 W., at footbridge in Redcliff, Eagle County. Nearest tributary, Turkey Creek, enters 100 yards below station; Homestake Creek enters 1 mile below.

DRAINAGE AREA.—74 square miles (measured on topographic map).

RECORDS AVAILABLE.—January 8, 1911, to September 30, 1922.

GAGE.—Chain gage on downstream side of footbridge; read by forest ranger. Staff gage in same section and referred to same datum, read during high water.

DISCHARGE MEASUREMENTS.—Made from highway bridge 300 yards above, station or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders and is very rough. Control short distance below gage; shifting between narrow limits. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.78 feet at 6.40 p. m. May 28 (discharge, 412 second-feet); minimum stage 0.30 foot on December 20, 21, and 23 (discharge, 6 second-feet).

1911–1922: Maximum stage recorded, 4.0 feet June 5, 1912 (discharge 1,010 second-feet); minimum stage, 0.01 foot at 7 a. m. October 15, 1917 (discharge, 1 second-foot).

ICE.—Stage-discharge relation not affected by ice except for occasional short periods.

DIVERSIONS.—Court decrees for diversion of 6 second-feet from Eagle River above station, and also a decree for diversion to the Arkansas basin of 18.5 second-feet from Piney Creek, a tributary. During 1922, 1,590 acre-feet were diverted.

REGULATION.—Diurnal fluctuation during spring, caused by alternate melting and freezing of mountain snow. Filling of Pando ice pond in fall reduces flow for a few days.

ACCURACY.—Stage-discharge relation practically permanent; slightly affected by ice during winter. Rating curve well defined. Gage read to quarter tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of Eagle River at Redcliff, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Jan. 26	T. J. Watkins	0.62	15.7	June 18	Robert Follansbee	1.99	161
May 25	Robert Follansbee	2.47	296	Sept. 12	M. B. Arthur	.78	16.5

Daily discharge, in second-feet, of Eagle River at Redcliff, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	22	19	15	12	12	15	110	272	88	48	25
2	19	22	19	15	12	14	17	104	240	85	60	24
3	19	22	19	15	12	15	22	104	240	78	54	24
4	19	22	17	15	12	15	22	117	224	74	40	24
5	19	22	19	15	12	12	26	110	224	72	31	24
6	10	19	19	15	12	14	26	145	256	72	31	22
7	9	19	19	15	12	15	26	167	256	70	32	20
8	10	19	19	15	12	12	26	158	256	62	27	19
9	12	20	19	15	12	12	26	158	256	70	26	19
10	11	19	19	15	12	14	26	145	256	83	26	19
11	18	19	19	15	12	15	26	150	224	65	27	19
12	19	19	19	15	12	15	26	131	224	57	24	18
13	19	19	19	15	12	15	26	118	224	53	24	17
14	20	19	17	15	12	15	26	105	224	49	23	17
15	22	19	19	15	14	15	25	92	196	48	24	16
16	22	19	16	15	15	17	26	112	154	43	58	15
17	23	19	14	15	12	17	26	136	154	39	69	15
18	24	19	12	15	15	14	30	145	154	40	53	15
19	22	19	10	14	15	15	30	145	154	38	43	15
20	22	19	7	12	16	15	26	150	145	38	30	15
21	22	19	6	12	14	17	30	150	142	50	27	15
22	22	19	7	12	15	19	40	150	135	42	30	15
23	22	19	6	12	12	22	50	167	128	38	29	16
24	23	19	8	12	14	22	68	189	123	33	28	15
25	22	19	10	12	15	22	68	286	115	29	28	17
26	22	19	10	12	14	19	68	324	109	28	24	16
27	22	19	12	12	15	18	74	361	104	26	24	17
28	22	19	12	12	12	17	74	400	95	31	22	17
29	22	19	14	12	-------	16	68	380	92	51	22	15
30	22	19	14	12	-------	15	80	361	90	34	24	16
31	22	-------	14	12	-------	15	-------	324	-------	39	24	-------

NOTE.—Stage-discharge relation affected by ice Oct. 26 to Nov. 1, Nov. 15, 27, Dec. 10, 17–19, and 23–31; discharge based on temperature and gage height records and observer's notes. No gage-height record Mar. 27–29, Apr. 13, May 13, 14, and 29; discharge interpolated.

Monthly discharge of Eagle River at Redcliff, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	24	9	19.4	1,190
November	22	19	19.5	1,160
December	19	6	14.6	898
January	15	12	13.8	848
February	16	12	13.1	728
March	22	12	15.8	972
April	80	15	37.3	2,220
May	400	92	184	11,300
June	272	90	182	10,800
July	88	26	52.4	3,220
August	69	22	33.3	2,050
September	25	15	18.0	1,070
The year	400	6	50.4	36,500

EAGLE RIVER AT EAGLE, COLO.

LOCATION.—In sec. 33, T. 4 S., R. 84 W., at left bank 500 feet below highway bridge at Eagle, Eagle County. Nearest tributary, Brush Creek, enters three-quarters of a mile below station.

DRAINAGE AREA.—650 square miles (revised; measured on map of Colorado, scale 1 : 500,000).

RECORDS AVAILABLE.—January 17, 1911, to September 30, 1922. March 12, 1905, to February 10, 1907, station was maintained short distance below mouth of Brush Creek.

GAGE.—Stevens water-stage recorder installed April 5, 1919; referred to inclined gage; inspected by Forest Service ranger.

DISCHARGE MEASUREMENTS.—Made from private bridge half a mile downstream or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders. Control at rapids in which gage intake is located; somewhat shifting. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder 4.4 feet at 5 a. m. May 30 (discharge, 3,880 second-feet); minimum discharge occurred during winter.

1911–1922: Maximum discharge recorded, 6,760 second-feet June 3, 1914; minimum discharge occurred during winter.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Between Eagle and Redcliff, court decrees for diversions of 80 second-feet, and below Eagle for 22 second-feet.

REGULATION.—Diurnal fluctuation during spring caused by alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice during winter. Rating curve well defined. Operation of water-stage recorder satisfactory except for periods as explained in footnote to table of daily discharge. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspection of recorder graph. Records excellent except for days of missing gage heights and periods affected by ice, for which they are fair.

Discharge measurements of Eagle River at Eagle, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Jan. 25	T. J. Watkins	* 0.89	103	May 24	Robert Follansbee	3.48	2,260
Mar. 18	do	*.90	238	June 17	do	3.23	1,900
Apr. 29	Robert Follansbee	1.61	518	Sept. 11	M. B. Arthur	1.05	221

* Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Eagle River at Eagle, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	200	175	144	130		115	144	721	2,290	1,200	610	364
2	209	170	142	132		147	152	770	2,220	1,110	735	380
3	209	164	132	137		142	164	805	2,360	1,030	791	360
4	203	164	110	130	108	130	189	848	2,140	1,020	679	340
5	197	162	135	117			223	892	2,290	1,000	520	321
6	194	154	159	112		116	226	1,220	2,760	968	452	302
7	192	147		115	110		194	1,580	2,840	945	404	283
8	194	147	132	132	135		200	1,510	3,470	848	369	264
9	186	140		140	144		216	1,400	3,470	855	343	245
10	183	137			132		192	1,170	3,280	1,050	332	226
11	180	144			123	153	172	975	3,020	878	338	223
12	175	144			121		189	855	3,020	763	300	212
13	170	147	152	120	119		175	784	3,020	714	274	203
14	167	159			121		162	721	2,520	672	282	194
15	164	159			119		175	742	2,080	686	282	189
16	159	157			121	186	180	728	1,950	700	286	180
17	159	152			126		164	784	1,950	650	380	177
18	159	147			128	180	154	1,130	2,140	630	610	177
19	154	142			121	183	152	1,490	2,140	630	513	172
20	149	162	134		135	186	162	1,540	2,140	600	470	167
21	147	149				223	177	1,880	2,080	580	422	162
22	144	144				270	233	1,600	2,010	552	410	157
23	144	142				270	296	1,760	1,760	506	392	152
24	149	140	132	104		255	386	2,290	1,820	476	343	149
25	175	147	144		108	192	446	2,760	1,720	440	322	149
26	167	142	144			180	482	3,190	1,580	392	300	152
27	170	132	142			180	464	3,470	1,460	375	282	154
28	172	130	135			154	500	3,570	1,270	386	282	154
29	172	137	132		-------	149	428	3,570	1,280	470	262	159
30	175	142	130		-------	144	578	3,470	1,320	470	291	157
31	172	-------	137		-------	132	-------	2,930	-------	446	314	-------

NOTE.—Stage-discharge relation affected by ice Nov. 17, 18, Dec. 7–23, Jan. 10 to Feb. 6, Feb. 21–28, Mar. 5–17; discharge based on temperature and gage-height record and two discharge measurements. No gage height record June 12, July 17–21, and Sept. 3–9; discharge based on comparison with flow of Roaring Fork at Glenwood Springs. Braced figures show mean discharge for periods indicated.

Monthly discharge of Eagle River at Eagle, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	209	144	174	10,700
November	175	130	149	8,870
December	-------	-------	138	8,480
January	-------	-------	115	7,070
February	144	-------	117	6,500
March	270	-------	167	10,300
April	578	144	252	15,000
May	3,570	721	1,650	101,000
June	3,470	1,270	2,250	134,000
July	1,200	375	711	43,700
August	791	262	406	25,000
September	380	149	217	12,900
The year	3,570	-------	530	384,000

ROARING FORK AT GLENWOOD SPRINGS, COLO.

LOCATION.—In sec. 9, T. 6 S., R. 89 W., 1,500 feet above mouth of river in Glenwood Springs, Garfield County.

DRAINAGE AREA.—1,460 square miles (revised; measured on map of Colorado, scale 1:500,000).

RECORDS AVAILABLE.—April 6, 1906, to September 30, 1909; September 21, 1910, to September 30, 1922.

GAGE.—Gurley water-stage recorder installed October 27, 1917, referred to inclined staff on left bank 800 feet above highway bridge; inspected by United States Forest Service employee and C. H. Oberly.

DISCHARGE MEASUREMENTS.—Made from single-span highway bridge.

CHANNEL AND CONTROL.—Bed composed of boulders and coarse gravel; shifting at long intervals. No well-defined control. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge, estimated 9,000 second-feet, on May 28 and June 9; minimum discharge occurred during winter.

1906–1909; 1910–22: Maximum discharge, 17,600 second-feet June 14, 1918, and June 14, 1921; minimum discharge, 225 second-feet on December 16, 1906.

ICE.—Stage-discharge relation not seriously affected by ice except for short periods.

DIVERSIONS.—Water diverted above the station for the irrigation of 8,100 acres from Roaring Fork and for 25,000 acres from tributaries.

REGULATION.—Diurnal fluctuation during spring, caused by alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation shifted slightly; affected by ice. Two well-defined rating curves used October 1 to February 28 and March 1 to September 30. Operation of water-stage recorder satisfactory except for periods as explained in footnote to table of daily discharge. Daily discharge ascertained by applying to rating tables mean daily gage height determined by inspection of recorder graph. Records good except for periods of missing gage heights and periods when affected by ice, for which they are fair.

Discharge measurements of Roaring Fork at Glenwood Springs, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Jan. 24	T. J. Watkins	[a] 0.95	417	Mar. 19	T. J. Watkins	0.92	509
Feb. 4	J. B. Spiegel	[a] .99	372	Apr. 28	Robert Follansbee	1.96	1,420

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Roaring Fork at Glenwood Springs, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	696	626	588	440	375	385	540	2,000	3,400	3,740	1,590	1,030
2	720	605	494	440	370	385	603	2,050	3,300	3,570	1,590	1,000
3	704	591	482	405	370	405	632	2,300	3,180	3,400	1,620	1,030
4	696	584	440	380	370	427	685	2,420	3,110	3,210	1,410	1,080
5	680	570	410	365	370	439	670	2,780	3,120	3,010	1,270	1,090
6	680	570	395	390	380	410	719	3,780	4,700	2,860	1,190	1,020
7	696	556	390	430	340	410	648	4,480	6,200	2,710	1,080	990
8	704	542	400	440	528	439	640	4,260	7,750	2,620	950	960
9	696	514	435	430	500	415	678	3,880	9,000	2,540	935	960
10	680	500	488	425	446	427	625	3,000	7,200	2,700	930	940
11	664	514	488	420	410	445	582	2,390	7,200	2,490	950	890
12	656	514	500	425	405	433	618	2,070	7,720	2,270	970	870
13	648	514	500	430	395	439	596	1,900	7,980	2,100	960	842
14	648	514	488	430	400	451	589	1,840	8,520	1,960	970	815
15	648	507	494	440	360	501	603	1,840	7,200	1,900	950	788

Daily discharge, in second-feet, of Roaring Fork at Glenwood Springs, Colo., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	640	440	458	440	400	540	632	1,850	5,820	1,840	1,280	779
17	626	425	385	430	395	719	603	2,100	5,820	1,710	1,270	779
18	619	400	390	415	390	632	575	2,610	5,770	1,650	1,240	762
19	598	430	400	405	405	527	561	3,350	5,710	1,590	1,250	736
20	591	494	415	380	435	561	603	3,950	5,660	1,590	1,230	719
21	577	494	425	390	476	596	694	4,500	5,600	1,590	1,210	702
22	570	482	420	400	452	685	930	5,240	5,510	1,540	1,260	694
23	570	494	400	410	390	744	1,160	5,850	5,480	1,490	1,210	685
24	591	494	395	415	375	719	1,410	6,700	5,460	1,450	1,160	685
25	640	507	370	425	370	640	1,480	7,600	5,580	1,400	1,100	685
26	626	500	390	435	380	625	1,590	8,040	5,250	1,350	1,060	685
27	626	488	415	435	375	640	1,580	8,520	5,020	1,290	1,020	694
28	640	470	435	430	370	575	1,490	9,000	4,770	1,270	990	710
29	640	476	440	420	-------	547	1,610	8,800	4,400	1,360	1,040	710
30	640	488	440	400	-------	540	1,760	6,700	4,050	1,400	1,110	702
31	626	-------	440	390	-------	520	-------	3,980	-------	1,480	1,060	-------

NOTE.—Stage-discharge relation affected by ice Nov. 16–19, Dec. 6–8, Dec. 18 to Feb. 6; discharge based on temperature and gage-height record and two discharge measurements. No gage-height record May 16–30, June 3–9, 18–23, 26–30; July 2–7, 10–14, 23–28, Aug. 3, 4, and 9–11; discharge determined from comparison with flow of Eagle River at Eagle and Colorado River at Glenwood Springs.

Monthly discharge of Roaring Fork at Glenwood Springs, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	720	570	646	39,700
November	626	400	510	30,300
December	588	370	439	27,000
January	440	365	416	25,600
February	528	340	401	22,300
March	744	385	523	32,200
April	1,760	540	870	51,800
May	9,000	1,840	4,190	258,000
June	9,000	3,110	5,650	336,000
July	3,740	1,270	2,100	129,000
August	1,620	930	1,160	71,300
September	1,090	685	834	49,600
The year	9,000	340	1,480	1,070,000

PARACHUTE CREEK AT GRAND VALLEY, COLO.

LOCATION.—In NW. ¼ sec. 12, T. 7 S., R. 96 W., at Aplin ranch, half a mile northwest of Grand Valley, Garfield County. No tributary between station and mouth, 1 mile below.

DRAINAGE AREA.—196 square miles (measured on map of Colorado, scale 1:500,000).

RECORDS AVAILABLE.—April 7, 1921, to September 30, 1922.

GAGE.—Vertical staff attached to side of left abutment of private bridge; read by R. H. Aplin.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of compact silt on shale rock. Control at rapids 200 feet downstream; slightly shifting during high water. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 2.9 feet May 20 and 21 (discharge, 795 second-feet); minimum stage recorded, 0.0 during parts of July, August, and September (discharge, 6 second-feet).

1921–1922: Maximum and minimum discharge, those of 1922.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Court decrees for diversion of 71 second-feet above station.

REGULATION.—Diurnal fluctuation during spring due to alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation shifted slightly. Two well defined rating curves used from October 1 to May 11 and May 12 to September 30. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating tables. Records fair.

Discharge measurements of Parachute Creek at Grand Valley, Colo., during the year ending September 30, 1922

[Made by F. C. Snyder[a]]

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 9	0.25	12.1	May 8	2.60	627	July 16	0.16	13.8
Mar. 13	.34	17.5	June 6	1.09	140	Aug. 16	.06	9.3
Apr. 5	.70	47.6						

[a] State hydrographer.

Daily discharge, in second-feet, of Parachute Creek at Grand Valley, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	15	28	26	352	250	36	22	6
2	16	15	20	28	352	250	36	47	6
3	16	15	18	30	388	221	36	36	6
4	16	15	18	39	406	207	36	28	6
5	16	15	18	49	499	172	36	25	6
6	15	15	18	39	615	155	32	22	6
7	15	15	16	35	700	143	28	22	6
8	15	15	15	39	745	121	28	19	6
9	15	15	15	44	790	121	28	16	6
10	15	15	15	39	745	110	28	16	6
11	14	14	15	37	537	110	27	22	6
12	13	13	15	37	418	90	25	16	6
13	13	13	15	35	436	90	26	16	6
14	13	13	22	37	382	80	22	11	6
15	13	13	30	39	346	80	22	8	6
16	13	13	39	28	382	80	22	14	6
17	13	13	47	28	436	70	17	50	6
18	13	13	30	28	575	70	12	32	6
19	13	13	24	32	705	61	11	16	6
20	13	13	22	39	795	61	11	6	6
21	14	13	26	47	795	61	8	6	6
22	15	13	32	81	660	54	6	6	6
23	15	13	39	100	575	47	6	6	6
24	15	13	47	146	575	47	6	6	6
25	15	13	39	171	535	36	6	6	6
26	15	13	32	197	455	36	6	6	6
27	15	13	47	197	418	36	6	6	6
28	15	13	30	225	400	36	6	6	6
29	15	13	28	286	329	36	6	6	6
30	15	13	30	318	296	36	6	6	6
31	15	------	28	------	280	------	6	6	------

Monthly discharge of Parachute Creek at Grand Valley, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	16	13	14.5	892
November	15	13	13.7	815
March	47	15	26.4	1,620
April	318	26	83.2	4,950
May	795	280	514	31,600
June	250	36	98.9	5,880
July	36	6	18.8	1,160
August	50	6	16.5	1,010
September	6	6	6.0	357

ROAN CREEK NEAR DE BEQUE, COLO.

LOCATION.—On line between secs. 10 and 15, T. 7 S., R. 98 W., at highway bridge 11 miles north of De Beque, Mesa County. Nearest tributary, Kimball Creek, enters half a mile above.

DRAINAGE AREA.—210 square miles (measured on map of Colorado; scale 1 : 500,000).

RECORDS AVAILABLE.—April 8, 1921, to September 30, 1922.

GAGE.—Chain gage attached to downstream side of bridge; read by Mrs. W. L. Hurt and J. W. Lunsford.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of compact mud and gravel; shifting during high water. No well-defined control. Banks not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year; 4.45 feet at 7.30 p. m. May 21 (discharge, 1,110 second-feet); minimum stage, 1.67 feet at 7.30 p. m. August 4 (discharge, 8 second-feet).

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Court decrees for diversion from Roan Creek of 28 second-feet above station and 70 second-feet below, and for 62 second-feet from tributaries entering above.

REGULATION.—Diurnal fluctuation during spring from alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation not permanent. Four fairly well defined rating curves used October 1 to November 30, March 1 to May 16, May 17 to July 5, and July 6 to September 30. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating tables except for period May 5 to 16, when discharge was determined by shifting-control method and comparison with record of flow of Parachute Creek. Records fair.

Discharge measurements of Roan Creek near De Beque, Colo., during the year ending September 30, 1922

[Made by F. C. Snyder[a]]

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 9	2.45	28.9	May 17	3.66	686	July 16	2.09	48.1
Mar. 21	2.53	55	June 6	2.94	334	Aug. 15	1.95	32.7
Apr. 25	3.19	168	July 6	2.33	94			

[a] State hydrographer.

Daily discharge, in second-feet, of Roan Creek near De Beque, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	28	26	74	465	454	44	17	36
2	31	28	26	89	510	406	58	17	36
3	28	27	26	74	510	360	58	17	49
4	28	26	34	89	610	360	44	10	66
5	26	26	34	89	710	315	44	26	49
6	26	26	26	89	910	272	49	36	36
7	24	26	26	89	960	230	86	36	36
8	26	26	26	89	910	189	66	26	26
9	26	25	19	89	1,010	189	66	26	36
10	28	26	26	89	1,010	189	49	26	26
11	30	26	34	89	810	189	49	26	26
12	29	24	34	89	710	189	49	26	26
13	28	28	42	74	660	153	49	26	26
14	31	26	61	74	660	122	66	26	26
15	31	24	74	74	660	122	49	26	36
16	28	26	106	74	610	96	49	26	36
17	28	22	172	74	860	75	49	36	36
18	29	23	51	74	970	58	36	36	36
19	28	23	61	89	970	58	26	26	36
20	28	25	61	89	1,080	44	26	26	36
21	28	25	89	89	1,080	44	26	36	36
22	28	23	89	125	1,080	51	36	49	36
23	28	23	89	125	1,020	51	36	49	36
24	35	24	89	172	860	32	26	49	36
25	38	26	89	172	860	32	26	49	36
26	38	26	125	204	805	32	26	49	26
27	33	25	106	204	650	22	26	36	26
28	33	23	89	244	650	22	26	49	36
29	33	20	74	288	600	44	26	36	36
30	33	20	74	376	600	44	17	36	36
31	30	------	74	------	550	------	26	36	------

Monthly discharge of Roan Creek near De Beque, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	38	24	29.7	1,830
November	28	20	24.9	1,480
March	172	19	63.0	3,870
April	376	74	122	7,260
May	1,080	465	785	48,300
June	454	22	148	8,810
July	86	17	42.2	2,590
August	49	10	32.0	1,970
September	66	26	35.2	2,090

TAYLOR RIVER AT ALMONT, COLO.

LOCATION.—In sec. 22, T. 51 N., R. 1 E., at highway bridge at Almont, Gunnison County, 300 feet above junction of Taylor and East rivers.

DRAINAGE AREA.—440 square miles (revised; measured on map of Colorado, scale 1 : 500,000).

RECORDS AVAILABLE.—June 27, 1910, to September 30, 1922.

GAGE.—Bristol float type water-stage recorder installed April 16, 1922, on downstream end of center pier; inspected by J. W. Brittain.

DISCHARGE MEASUREMENTS.—Made from two-span bridge.

CHANNEL AND CONTROL.—Bed composed of small boulders and coarse gravel; slightly shifting at long intervals. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.15 feet at 7 a. m. May 30 (discharge, 2,420 second-feet); minimum discharge occurred during winter.

1910–1922: Maximum stage recorded, 5.0 feet on June 9, 1920 (discharge, 3,760 second-feet); minimum stage, 1.2 feet several days during August, 1913 (discharge, 50 second-feet).

ICE.—Stage-discharge relation affected by ice during winter.

DIVERSIONS.—No court decrees for diversions from Taylor River.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent; affected by ice during winter. Rating curve well defined. Gage read to hundredths twice daily from October 1 to April 18. Operation of water-stage recorder satisfactory April 19 to September 30. Daily discharge ascertained by applying to rating table mean daily gage height determined from two daily gage height readings or inspection of recorder graph. Records excellent except for periods affected by ice, for which they are fair.

Discharge measurements of Taylor River at Almont, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 23	J. B. Spiegel	1.99	187	May 22	Robert Follansbee	3.15	1,010
Dec. 9	T. J. Watkins	[a] 1.63	78	July. 9	Baily and Elliott	2.64	576
Feb. 1	do	[a] 2.68	155	13	M. B. Arthur	2.56	494
Mar. 15	do	1.92	158	Sept. 7	do	2.04	200
Apr. 16	do	1.85	138				

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Taylor River at Almont, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	163	185				153	153	565	1,630	915	450	270
2	163	185			153	153	153	605	1,560	825	413	270
3	159	185	98	149		153	153	673	1,700	780	375	248
4	156	185					179	825	1,700	735	350	256
5	179	182			140		179	1,030	1,700	735	325	234
6	205	179					153	1,230	1,930	735	308	217
7	205	179					169	1,290	2,010	690	266	209
8	205	153	80			153	153	1,150	2,170	605	243	205
9	205	148		111			153	942	2,170	565	248	201
10	205	137					131	825	1,930	825	256	189
11	205	126					116	762	1,930	648	261	185
12	205	124					142	589	1,930	565	256	185
13	205	116				153	137	589	1,930	486	252	185
14	205	116			153	153	148	605	1,850	457	281	185
15	205	116				153	142	648	1,700	430	320	185
16	205	116				153	140	573	1,490	413	308	185
17	205					153	145	690	1,360	394	394	185
18	201	97	93			153	131	906	1,490	394	387	175
19	185					153	142	960	1,420	394	368	163
20	182					153	159	980	1,420	413	350	159
21	169			153		145	169	1,120	1,290	406	320	153
22	169				159	137	225	1,120	1,290	387	314	153
23	179	104				148	252	1,290	1,170	335	276	153
24	185					166	298	1,560	1,170	325	276	153
25	185					166	320	1,780	1,120	292	266	156
26	185				153	153	338	2,010	1,060	281	248	169
27	185				153	153	314	2,170	960	298	261	163
28	185	114	127		153	153	350	2,170	915	331	276	175
29	185				-------	153	420	2,170	960	387	276	179
30	185				-------	153	503	2,170	960	387	276	169
31	185	-------			-------	153	-------	1,930	-------	450	270	-------

NOTE.—Stage-discharge relation affected by ice Nov. 17 to Feb. 25, Mar. 4–12; discharge based on temperature, gage-height record, and two discharge measurements. Braced figures show mean discharge for periods indicated.

Monthly discharge of Taylor River at Almont, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	205	156	189	11,600
November	185	----------	130	7,740
December	----------	----------	98.3	6,040
January	----------	----------	144	8,850
February	----------	----------	152	8,440
March	166	----------	153	9,410
April	503	116	206	12,300
May	2,170	565	1,160	71,300
June	2,170	915	1,530	91,000
July	915	281	512	31,500
August	450	243	305	18,800
September	270	153	190	11,300
The year	2,170	----------	398	288,000

GUNNISON RIVER NEAR GUNNISON, COLO.

LOCATION.—In sec. 3, T. 49 N., R. 1 W., at highway bridge 2 miles southwest of Gunnison, Gunnison County. Nearest tributary, Tomichi Creek, enters 1 mile below.

DRAINAGE AREA.—1,010 square miles (measured on map in Hayden's atlas).

RECORDS AVAILABLE.—November 27, 1910, to November 30, 1914; April 27, 1916, to September 30, 1922.

GAGE.—Chain gage on downstream side of bridge; datum lowered 1.00 foot October 15, 1918; read by C. W. Chinery.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders. Control at well-defined rapids below bridge; somewhat shifting. Banks not subject to overflow except during extreme high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.4 feet at 7 a. m. May 30 (discharge, 5,200 second-feet); minimum discharge occurred during winter.

1910–1914; 1916–1922: Maximum discharge, 11,400 second-feet June 13, 1918; minimum discharge, 126 second-feet on January 2, 1919.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Court decrees for diversion of 274 second-feet of water from Gunnison River between this station and forks at Almont.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Two fairly well defined rating curves used October 1 to May 30 and May 31 to September 30. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating tables except period April 1 to May 30 when shifting-control method was used. Records good except for period affected by ice and period of shifting control for which they are fair.

Discharge measurements of Gunnison River near Gunnison, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 23	J. B. Spiegel	1.09	300	May 22	Robert Follansbee	3.18	2,750
Dec. 9	T. J. Watkins	[a] 1.04	188	June 11	do	3.91	4,010
Jan. 31	do	[a] 2.26	337	July 15	M. B. Arthur	1.94	774
Mar. 16	do	[a] 1.41	217	Sept. 8	do	1.38	358
Apr. 12	do	1.24	346				

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Gunnison River near Gunnison, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	370	310					270	1,470	3,750	1,820	650	360
2	370	322		285			270	1,610	3,150	1,660	740	360
3	370	310			295	262	334	1,680	2,950	1,520	695	360
4	358	300					412	1,840	3,350	1,370	570	425
5	370	310		202			412	2,420	3,550	1,300	570	425
6	358	310	218				382	2,950	3,750	1,300	532	392
7	370	300					370	3,330	3,750	1,240	495	360
8	370	310					382	3,140	4,350	1,050	495	354
9	370	310					382	2,420	4,350	1,050	460	360
10	370	300				250	370	2,250	3,350	1,240	532	344
11	358	310		265	304		382	1,760	3,550	995	495	310
12	322	310					352	1,610	3,350	995	460	300
13	310	322					334	1,610	3,550	940	495	290
14	310	310					295	1,470	3,550	788	532	280
15	322	300					322	1,610	3,350	740	570	260
16	310	310	235			225	328	1,780	2,950	695	532	260
17	322						328	1,780	2,760	740	532	255
18	310						316	2,600	2,760	695	570	255
19	370	236					328	2,600	2,760	650	570	250
20	322						376	2,780	2,760	695	532	236
21	310				310	240	388	2,780	2,580	650	532	227
22	310						521	2,780	2,580	695	532	213
23	310	260		279			594	3,160	2,580	570	495	208
24	310						770	3,550	2,580	532	460	208
25	310						820	3,950	2,400	532	425	208
26	300		260				920	4,160	2,400	495	392	217
27	285				297	267	820	4,360	2,230	460	392	227
28	310	259					870	4,580	2,060	460	360	227
29	310				-------		973	4,780	1,820	532	360	222
30	300				-------		1,200	4,780	1,820	570	392	227
31	300	-------			-------		-------	3,950	-------	570	392	-------

NOTE.—Stage-discharge relation affected by ice Nov. 17 to Mar. 31; discharge based on temperature and gage-height records, three discharge measurements, and observer's notes. Braced figures show mean discharge for periods indicated.

Monthly discharge of Gunnison River near Gunnison, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	370	300	332	20,400
November	322	----------	283	16,800
December	----------	----------	238	14,600
January	----------	----------	268	16,500
February	----------	----------	304	16,900
March	----------	----------	250	15,400
April	1,200	270	494	29,400
May	4,780	1,470	2,760	170,000
June	4,350	1,820	3,020	180,000
July	1,820	460	889	54,700
August	740	360	508	31,200
September	425	208	287	17,100
The year	4,780	----------	805	583,000

GUNNISON RIVER NEAR GRAND JUNCTION, COLO.

LOCATION.—In NW. ¼ sec. 35, T. 1 S., R. 1 W., half a mile below the Redlands Co.'s canal and 2 miles above mouth of river and Grand Junction, Mesa County; below all tributaries.

DRAINAGE AREA.—8,020 square miles (revised; measured on map of Colorado; scale 1 : 500,000).

RECORDS AVAILABLE.—April 1, 1917, to September 30, 1922. From October 19, 1894, to December 21, 1895, and May 2, 1897, to September 30, 1899, station maintained near mouth.

GAGE.—Vertical staff at left bank a quarter of a mile below canal intake; read by employee of Redlands Co.

DISCHARGE MEASUREMENTS.—Made from car and cable at gage section.

CHANNEL AND CONTROL.—Bed composed of compact gravel; permanent. Control at rapids 500 feet downstream; practically permanent. Banks high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year at river station, 11.3 feet at 5 p. m. May 7 (discharge, 22,000 second-feet); minimum discharge, 8 second-feet from September 18–30.

1917–1922: Maximum stage recorded, 14.95 feet at 8 a. m. and noon May 23, 1920 (discharge, 35,300 second-feet); minimum discharge, that of September 18–30, 1922.

ICE.—Stage-discharge relation affected by ice for short periods.

DIVERSIONS.—Below all diversions from Gunnison River. Most of water diverted through Redlands Canal is for pumping and is returned to Colorado River below Gunnison River.

COMBINED FLOW.—Combined flow of Gunnison River and Redlands power canal represents flow of Gunnison River which enters Colorado River, less about 25 second-feet which is used during irrigation season.

ACCURACY.—Stage-discharge relation permanent; not affected by ice during winter. Rating curve well defined. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records excellent.

COOPERATION.—Daily gage-height record for station on river and complete records for power canal furnished by Redlands Co.

Discharge measurements of Gunnison River near Grand Junction, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Jan. 27	F. C. Snyder [a]	2.55	858	May 29	F. C. Snyder	10.56	19,200
Mar. 27	do	3.40	1,730	Aug. 7	do	1.48	257
Apr. 6	J. H. Baily [a]	3.90	2,510	Sept. 25	do	.51	8 [b]
May 12	F. C. Snyder	6.98	8,010				

[a] State hydrographer. [b] Estimated.

Daily discharge, in second-feet, of Gunnison River near Grand Junction, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	370	1,350	1,460	1,300	830	1,100	1,100	12,200	14,900	4,960	2,500	119
2	469	1,460	1,460	1,350	830	1,100	1,010	12,200	12,500	4,440	1,300	106
3	522	1,400	1,370	1,400	830	965	1,250	12,900	11,500	4,270	495	92
4	522	1,250	1,350	1,400	830	920	1,300	14,200	10,900	3,350	418	106
5	522	1,150	1,300	1,460	830	920	1,800	14,900	10,900	2,780	302	106
6	469	1,150	1,150	1,400	830	920	2,240	19,000	11,500	2,500	302	50
7	469	965	728	1,400	830	875	1,680	21,700	12,500	2,500	260	50
8	522	1,250	983	1,400	830	830	1,400	20,700	12,900	2,500	260	50
9	580	1,300	1,060	1,350	848	830	1,250	18,300	14,500	1,620	185	50
10	522	1,060	1,060	1,100	875	875	1,560	14,200	13,900	1,510	119	50
11	550	1,250	1,060	1,120	830	875	1,250	10,300	12,900	1,510	119	50
12	580	1,250	1,060	1,100	790	920	1,010	8,260	11,500	1,400	119	50
13	580	1,200	1,060	1,100	750	1,010	920	7,000	11,500	1,300	119	20
14	580	1,200	1,060	1,060	642	1,010	875	6,540	11,900	550	119	20
15	580	1,150	1,080	938	750	1,060	790	7,000	11,500	550	151	20
16	580	1,150	1,060	830	830	1,100	1,150	7,000	10,300	495	185	20
17	580	1,250	1,060	830	830	1,150	1,200	7,740	8,530	469	302	14
18	580	1,280	1,100	712	875	1,300	1,300	10,600	8,000	394	302	8
19	610	965	1,100	735	920	1,350	830	13,500	8,800	260	302	8
20	610	1,150	1,400	712	920	1,200	675	14,200	8,530	260	347	8
21	550	1,220	1,430	690	920	1,200	675	15,600	8,000	260	712	8
22	469	1,250	1,250	675	1,100	1,100	2,500	14,900	7,490	260	1,400	8
23	469	1,350	1,350	623	1,200	1,250	3,950	15,600	7,490	260	1,100	8
24	443	1,350	1,250	610	1,220	1,400	4,110	17,600	7,000	260	830	8
25	370	1,420	1,250	662	1,250	1,800	4,960	18,300	7,240	260	550	8
26	675	1,480	1,250	750	1,300	1,860	5,320	18,300	5,700	260	469	8
27	965	1,540	1,270	790	1,200	1,860	6,100	19,000	5,700	260	221	8
28	1,060	1,460	1,350	830	1,150	1,740	6,540	19,300	5,140	302	185	8
29	1,060	1,350	1,350	830	-------	1,800	7,490	19,600	4,440	347	119	8
30	965	1,300	1,400	814	-------	1,250	11,500	18,700	4,270	1,060	119	8
31	965	-------	1,350	830	-------	1,150	-------	17,600	-------	1,100	119	-------

Monthly discharge of Gunnison River near Grand Junction, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,060	370	606	37,300
November	1,540	965	1,260	75,000
December	1,460	728	1,210	74,400
January	1,460	610	994	61,100
February	1,300	642	923	51,300
March	1,860	830	1,180	72,600
April	11,500	675	2,590	154,000
May	21,700	6,540	14,400	885,000
June	14,900	4,270	9,730	579,000
July	4,960	260	1,360	83,600
August	2,500	119	453	27,900
September	119	8	35.9	2,140
The year	21,700	8	2,910	2,100,000

Combined daily discharge, in second-feet, of Gunnison River and Redlands Canal near Grand Junction, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	860	1,350	1,460	1,300	830	1,100	1,410	12,700	15,400	5,470	2,980	559
2	954	1,460	1,460	1,350	830	1,100	1,320	12,700	13,000	4,950	1,790	546
3	1,010	1,560	1,370	1,400	830	965	1,560	13,400	12,000	4,780	970	532
4	988	1,250	1,350	1,400	830	920	1,620	14,700	11,400	3,840	878	546
5	992	1,150	1,300	1,460	830	920	2,170	15,400	11,400	3,280	782	546
6	953	1,150	1,150	1,400	830	920	2,610	19,500	12,000	3,010	802	515
7	951	1,120	953	1,400	830	875	2,030	22,200	13,000	3,000	750	520
8	1,000	1,250	1,100	1,400	830	830	1,730	21,200	13,400	3,010	760	530
9	1,060	1,300	1,060	1,350	848	830	1,580	18,800	15,000	2,130	683	520
10	1,000	1,220	1,060	1,100	875	875	1,900	14,700	14,400	2,020	619	520
11	1,010	1,250	1,060	1,120	830	875	1,590	10,800	13,400	2,020	617	510
12	1,040	1,250	1,060	1,100	790	920	1,340	8,720	12,000	1,910	619	510
13	1,040	1,200	1,060	1,100	750	1,010	1,280	7,460	12,000	1,810	619	480
14	1,040	1,260	1,060	1,060	642	1,010	1,250	7,000	12,400	1,060	619	480
15	1,040	1,210	1,080	988	750	1,060	1,170	7,460	12,000	1,050	651	480
16	1,040	1,190	1,060	830	830	1,100	1,550	7,480	10,800	1,000	685	480
17	1,040	1,250	1,060	830	830	1,150	1,590	8,240	9,040	979	802	474
18	1,040	1,320	1,100	712	875	1,300	1,690	11,100	8,510	894	802	468
19	1,070	965	1,100	735	920	1,350	1,230	14,000	9,310	770	802	476
20	1,060	1,150	1,400	712	920	1,200	1,090	14,700	9,040	770	847	478
21	1,000	1,220	1,430	690	920	1,200	1,120	16,100	8,510	770	1,190	473
22	919	1,250	1,250	675	1,100	1,100	2,950	15,400	8,000	770	1,840	458
23	919	1,320	1,350	623	1,200	1,250	4,410	16,100	8,000	770	1,540	448
24	893	1,350	1,250	610	1,220	1,400	4,560	18,100	7,510	770	1,270	448
25	820	1,420	1,250	662	1,250	1,800	5,420	18,800	7,750	770	990	449
26	1,120	1,480	1,250	750	1,300	1,860	5,780	18,800	6,210	690	909	468
27	1,420	1,540	1,270	790	1,200	1,860	6,560	19,500	6,210	738	661	468
28	1,510	1,460	1,350	830	1,150	1,740	6,990	19,800	5,670	782	625	478
29	1,510	1,350	1,350	830	-------	1,940	7,950	20,100	4,940	822	559	468
30	1,420	1,300	1,400	814	-------	1,510	12,000	19,200	4,760	1,560	559	468
31	1,400	-------	1,350	830	-------	1,470	-------	18,100	--------	1,580	559	-------

Combined monthly discharge of Gunnison River and Redlands Canal near Grand Junction, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,510	820	1,070	65,800
November	1,560	965	1,290	76,800
December	1,460	953	1,220	75,000
January	1,460	610	994	61,100
February	1,300	642	923	51,300
March	1,940	830	1,210	74,400
April	12,000	1,090	2,980	177,000
May	22,200	7,000	14,900	916,000
June	15,400	4,760	10,200	607,000
July	5,470	690	1,860	114,000
August	2,980	559	928	57,100
September	559	448	493	29,300
The year	22,200	448	3,190	2,360,000

EAST RIVER AT ALMONT, COLO.

LOCATION.—In sec. 22, T. 51 N., R. 1 E., at highway bridge at Almont, Gunnison County, 100 feet above junction of East and Taylor rivers.

DRAINAGE AREA.—295 square miles (measured on Forest Service atlas).

RECORDS AVAILABLE.—July 27, 1910, to April 30, 1922, when station was discontinued. From April 15 to October 8, 1905, a station was maintained at this point, gage being referred to different datum.

GAGE.—Vertical staff on downstream side of right abutment; read by J. W. Brittain.

DISCHARGE MEASUREMENTS.—Made from two-span bridge.

CHANNEL AND CONTROL.—Channel composed of small boulders and coarse gravel. Control shifting.

EXTREMES OF DISCHARGE.—Maximum stage for the period October 1, 1921, to April 30, 1922, 1.95 feet on April 30 (discharge, 650 second-feet); minimum stage occurred during ice-affected period.

1910–1921: Maximum stage, 6.6 feet June 15, 1921 (discharge not computed); minimum stage, 0.30 foot August 13, 1913 (discharge, 19 second-feet).

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Court decrees for diversion of 78 second-feet from East River.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent; affected by ice. Rating curve well defined. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage-height to rating table. Records good except for period affected by ice, for which they are fair.

Discharge measurements of East River at Almont, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 23	J. B. Spiegel	0.88	99
Dec. 9	T. J. Watkins	[a].99	58
Feb. 1	do	[a]1.73	66

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of East River at Almont, Colo., for the period October 1, 1921, to April 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	116	100					73
2	116	100					73
3	114	100					74
4	112	100					85
5	112	98					97
			58	62	64		
6	110	97					88
7	108	96					90
8	104	94					96
9	100	91				64	100
10	100	85					94
11	100	84					91
12	100	83					97
13	100	81					91
14	100	81					90
15	100	81					97
			63		70		
16	100	81					94
17	100	81				69	85
18	100	81				69	85
19	100	81				69	85
20	100	75				69	94
				65			
21	100	75				72	120
22	100	75				69	157
23	100	75				73	196
24	100	75				75	242
25	100	75			65	77	303
			65				
26	100	75				79	394
27	100	75				79	380
28	100	75				75	429
29	100	70				75	510
30	100	70			--------	74	650
31	100	--------			--------	73	--------

NOTE.—Stage-discharge relation affected by ice Nov. 29 to Mar. 16; discharge based on temperature and gage-height records, and two discharge measurements. Braced figures show mean discharge for periods indicated.

Monthly discharge of East River at Almont, Colo., for the period October 1, 1921, to April 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	116	100	103	6,330
November	100	70	83.7	4,980
December			62.1	3,820
January			64.0	3,940
February			66.4	3,690
March	79		68.4	4,210
April	650	73	172	10,200

TOMICHI CREEK AT SARGENTS, COLO.

LOCATION.—In NW. ¼ sec. 28, T. 48 N., R. 5 E., at railroad bridge three-quarters of a mile west of Sargents, Saguache County. Nearest tributary, Marshall Creek, enters a quarter of a mile above.

DRAINAGE AREA.—165 square miles (measured on map in Hayden's atlas).

RECORDS AVAILABLE.—May 12, 1917, to September 30, 1922, when station was discontinued.

GAGE.—Stevens water-stage recorder; inspected by H. R. Aikin.

DISCHARGE MEASUREMENTS.—Made from highway bridge 1,000 feet downstream or by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel. Control 30 feet downstream at small rapids of compact gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum discharge during year 305 second-feet, estimated, on May 28; minimum discharge occurred during winter.

1917–1922: Maximum stage, 4.05 feet on June 9, 1921 (discharge, 792 second-feet); minimum discharge, 6 second-feet on December 16, 1920.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—A few small ditches divert water for irrigation above Sargents.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Rating curve well defined. Operation of water-stage recorder was satisfactory except for periods indicated in footnote to table of daily discharge. Daily discharge ascertained by applying to rating tables mean daily gage height determined by inspection of recorder graph. Records good except for periods of missing gage-heights, for which they are fair.

Discharge measurements of Tomichi Creek at Sargents, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 25	J. B. Spiegel	2.29	44.9	June 14	Robert Follansbee	2.95	163
Dec. 10	T. J. Watkins	[a] 2.60	20.6	July 11	M. B. Arthur	2.19	44.4
Jan. 30	do	[a] 3.40	26.3	Sept. 6	do	1.84	20.0
May 21	Robert Follansbee	3.20	226				

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Tomichi Creek at Sargents, Colo., for the year ending September 30, 1922

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1			230	63	56	22	16		141	129	32	27	14
2			195	57	45	22	17		155	125	31	28	14
3		150	200	54	39	24	18		186	114	33	25	14
4			206	50	35	27	19		196	109	34	28	14
5			217	48	29	25	20		214	100	32	30	13
6			220	47	29	20	21	37	231	90	33	28	13
7	38		209	45	28	19	22		225	88	35	32	13
8		194	214	42	26	19	23		240	90	32	29	12
9			209	39	26	19	24		243	90	31	28	12
10			198	43	27	16	25	45	243	90	29	27	12
11		178	190	43	29	16	26		246	83	26	23	12
12		158	180	38	27	15	27		250	71	28	23	11
13		151	171	35	26	15	28		305	65	34	23	10
14	38	151	153	34	27	15	29		270	66	32	23	10
15		153	135	32	26	15	30		290	65	34	23	10
							31		270		47	22	

NOTE.—No gage-height record May 1–10, May 26 to June 3, Aug. 30 to Sept. 5, and Sept. 13–24; discharge based on comparison with flow of Cottonwood Creek near Buena Vista and East Fork of Arkansas River near Leadville.

Monthly discharge of Tomichi Creek at Sargents, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October			38	2,340
May	305		201	12,400
June	230	65	143	8,510
July	63	26	38.5	2,370
August	56	22	28.8	1,770
September	27	10	15.8	940

NOTE.—Mean discharge for October obtained by averaging five daily discharges.

LAKE FORK AT LAKE CITY, COLO.

LOCATION.—In sec. 34, T. 44 N., R. 4 W., at private bridge one-third mile above Henson Creek, in Lake City, Hinsdale County.

DRAINAGE AREA.—126 square miles (measured on topographic map).

RECORDS AVAILABLE.—April 21, 1918, to September 30, 1922.

GAGE.—Vertical staff fastened to downstream side of right abutment of bridge; read by Eugene Otis.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Bed of stream composed of coarse gravel well compacted. Control at small rapids 250 feet downstream; shifting during extreme high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 2.62 feet at 7 a. m. and 6 p. m. June 8 and 7 a. m. June 11 (discharge, 1,000 second-feet); minimum discharge occurred during winter.

1918–1922: Maximum discharge recorded, 1,560 second-feet on June 12 and 15, 1921; minimum stage, 0.57 foot on March 20, 1919 (discharge, 10 second-feet).

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Practically none which do not return to stream above station. Court decrees for diversion of 22 second-feet below station.

REGULATION.—Flow regulated by Lake San Cristobal, located 4 miles upstream; area 1 square mile. During low water, operation of power plant located 1 mile upstream, may influence discharge slightly.

ACCURACY.—Stage-discharge relation not permanent; affected by ice. Three fairly well-defined rating curves used October 1 to January 3, March 26 to August 31, and September 1–30. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating tables except periods March 26 to April 13 and July 26 to August 31, when shifting-control method was used.

Discharge measurements of Lake Fork at Lake City, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 22	J. B. Spiegel	1.07	32.6	July 19	M. B. Arthur	1.58	161
Apr. 18	T. J. Watkins	.86	26.7	Sept. 9	do	.76	25.8
June 9	Robert Follansbee	2.58	946				

Daily discharge, in second-feet, of Lake Fork at Lake City, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	25	21	14			19	162	613	535	154	60
2	49	25	23	14			19	180	474	518	154	60
3	47	30	23	14	12		22	208	442	474	137	60
4	47	25	23				35	220	526	450	125	62
5	47	25	23				44	249	646	434	123	58
6	47	25	25				66	368	755	434	114	48
7	49	25	25				75	482	807	396	110	41
8	47	25	25			13	64	474	1,000	329	108	38
9	45	25	25				54	382	970	302	93	30
10	42	25	30	14			38	307	970	285	93	27
11	42	25	31		14		29	240	970	267	91	22
12	42	25	30				30	197	940	244	93	22
13	40	23	29				31	193	955	228	91	22
14	40	22	24				25	167	970	212	89	22
15	40	21	22				22	170	910	204	101	22
16	38	21	21				21	174	794	190	99	22
17	37	17	24				21	170	755	174	91	22
18	37	20	26	12			27	212	781	160	91	24
19	37	24	26				34	276	768	154	91	23
20	35	23	21				40	290	781	150	91	20
21	35	22	16			15	54	318	768	154	89	20
22	33	21	13		13		58	334	755	144	81	25
23	33	21	13				81	368	703	140	79	44
24	35	22	21				105	442	679	130	71	44
25	37	21	22				132	535	613	120	68	44
26	35	22	23	14		15	125	657	591	118	62	41
27	36	23	18			15	114	679	591	114	60	30
28	33	21	17			14	108	690	591	114	58	27
29	32	21	18		-------	15	114	703	571	114	60	24
30	27	21	16		-------	15	132	755	535	114	58	24
31	24	-------	14		-------	18	-------	755	-------	128	58	-------

NOTE.—Stage-discharge relation affected by ice Jan. 4 to Mar. 25; discharge based on temperature and gage-height records and observer's notes. Braced figures show mean discharge for periods indicated.

Monthly discharge of Lake Fork at Lake City, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	50	24	39.3	2,420
November	30	17	23.0	1,370
December	31	13	22.2	1,360
January			13.7	842
February			13.2	733
March			14.1	867
April	132	19	58.0	3,450
May	755	162	366	22,500
June	1,000	442	741	44,100
July	535	114	243	14,900
August	154	58	93.0	5,720
September	62	20	34.3	2,040
The year	1,000		139	100,000

LEROUX CREEK NEAR LAZEAR, COLO.

LOCATION.—In sec. 33, T. 13 S., R. 93 W., at highway bridge, 8 miles north of Lazear, Delta County. No important tributary within several miles.

DRAINAGE AREA.—52 square miles (measured on Forest Service atlas).

RECORDS AVAILABLE.—May 15, 1917, to September 30, 1922.

GAGE.—Stevens water-stage recorder, referred to vertical staff fastened to face on left bridge abutment; inspected by G. H. Henderson.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders; very rough. Control 50 feet downstream; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.85 feet at 6.30 p. m. May 27 (discharge, 1,360 second-feet); minimum stage, creek practically dry during winter.

1917–1922: Maximum discharge, 1,420 second-feet June 17, 1917, and May 29, 1921; minimum stage, creek practically dry during winter.

ICE.—No data. Practically entire flow of stream is stored in reservoirs during winter.

DIVERSIONS.—Court decrees for diversion of 55 second-feet above station, of which 33 second-feet are for diversion out of the drainage basin. Adjudicated decrees for 290 second-feet, below station.

REGULATION.—Diurnal fluctuation during spring caused by alternate melting and freezing of mountain snow. Flow in nonirrigating season stored in reservoirs on headwaters. Decrees for such storage amount to 606 acre-feet.

COOPERATION.—Complete records furnished by State engineer.

Daily discharge, in second-feet, of Leroux Creek near Lazear, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	4.7	4.5	------	318	537	74	21	11
2	8.6	4.4	------	376	537	63	16	12
3	5.0	3.0	------	441	512	44	12	13
4	3.5	3.0	------	464	562	39	9.2	25
5	3.3	3.0	------	664	562	42	8.8	22
6	3.5	3.0	------	799	537	35	8	14
7	3.5	3.0	------	638	488	41	10	8.0
8	3.3	3.0	------	488	488	40	10	5.6
9	2.8	3.0	------	283	441	43	7.7	12.0
10	2.6	3.0	------	196	346	45	8	4.0
11	3.5	3.0	------	119	251	47	11	1.2
12	4.4	3.0	------	89	236	40	8	1.2
13	3.3	3.0	------	84	251	38	16	1.6
14	3.3	1.2	------	98	236	33	21	.8
15	3.3	1.2	------	105	163	32	21	.8
16	3.2	3.0	12	127	135	36	21	.8
17	3.0	2.0	12	222	127	40	22	.6
18	2.9	2.0	11	376	135	40	14	1.1
19	2.9	2.0	10	397	127	38	16	1.0
20	2.9	2.0	11	441	119	38	17	.7
21	2.9	2.0	30	397	112	40	16	.7
22	2.9	2.0	67	537	105	37	14	.6
23	2.8	2.0	105	744	98	32	14	.6
24	3.0	2.0	144	856	92	27	14	.5
25	4.4	2.0	163	717	82	25	14	.5
26	4.4	2.0	144	717	75	23	7.7	.5
27	3.7	2.0	119	856	73	30	7.1	.5
28	3.2	2.0	144	744	74	29	4.8	.4
29	2.8	2.0	173	799	77	38	10	.3
30	3.0	2.0	318	690	89	33	12	.7
31	4.4	------	------	612	------	27	12	------

Monthly discharge of Leroux Creek near Lazear, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8.6	2.6	3.58	220
November	4.5	1.2	2.51	149
April 16-30	------	------	97.5	2,900
May	856	84	464	28,500
June	562	73	256	15,200
July	74	23	38.4	2,360
August	22	4.8	13	799
September	25	.3	4.72	281

SURFACE CREEK AT CEDAREDGE, COLO.

LOCATION.—About sec. 29, T. 13 S., R. 94 W., at Cedaredge, Delta County. Nearest tributary, Mill Creek, enters 4 miles above.

DRAINAGE AREA.—43 square miles (measured on Forest Service atlas).

RECORDS AVAILABLE.—May 16, 1917, to September 30, 1922.

GAGE.—Stevens water-stage recorder referred to vertical staff fastened to concrete abutment of footbridge 400 feet upstream from highway bridge in Cedaredge; inspected by J. C. Rock.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage section.

CHANNEL AND CONTROL.—Bed composed of small boulders filled in behind control which is old concrete weir, located 12 feet downstream. At high stages water flows through overflow channel which may shift somewhat.

EXTREMES OF DISCHARGE.—Maximum discharge during year 660 second-feet at midnight May 5; minimum discharge during winter when creek was practically dry.

1917–1922: Maximum stage, 1.8 feet at 7 a. m. May 24, 1920 (discharge, 715 second-feet); minimum stage during winter is practically zero.

ICE.—No data. Flow very small as most of it is stored during winter.

DIVERSIONS.—Adjudicated decrees for diversion of 142 second-feet above station, of which 67 second-feet are for diversion out of the drainage basin. Adjudicated decrees for 272 second-feet, below station.

REGULATION.—Alternate melting and freezing of snow in mountains caused diurnal fluctuation during spring of year. Adjudicated decrees for storage of 8,140 acre-feet on headwaters. The storage and release of this water changes the natural flow.

COOPERATION.—Complete records furnished by State engineer.

Daily discharge, in second-feet, of Surface Creek at Cedaredge, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	11	0.6		182	245	77	10	26
2	12	.6		300	245	74	27	32
3	10	1.0		330	240	68	22	20
4	8.4	1.4		400	240	60	29	25
5	10	1.8		450	270	88	23	25
6	11	.6		540	290	60	23	25
7	11	.5		520	270	68	20	22
8	8.4	1.0		400	270	65	17	21
9	7.2	1.4		240	230	60	17	18
10	5.2	2.2		150	180	60	26	17
11	5.2	2.2		100	160	62	20	17
12	4.6	1.0		72	160	43	27	15
13	5.2	.6		72	140	35	34	13
14	7.2	.6		72	114	77	35	9.4
15	18	.6		72	100	58	34	9.4
16	3	.6		84	77	41	51	8.3
17	2.2	.6		130	77	37	46	7.2
18	2.6	1.4		210	68	50	37	5.6
19	2.6	2.2		220	77	57	38	5.0
20	3.0	3.0		230	77	45	33	6.7
21	3.0	1.2		270	77	45	32	11
22	3.4	1.0		290	77	37	27	15
23	2.2	.7		320	77	27	22	20
24	.5	.4		310	77	16	22	18
25	.6	.3		310	77	18	22	14
26	.6	.2		340	68	35	40	14
27	1.0	.2	62	320	60	39	42	14
28	1.0	.2	82	290	66	27	26	15
29	1.0	.2	106	290	66	23	26	14
30	.6	.2	166	290	88	8.8	39	12
31	.6			280		6.7	37	

Monthly discharge of Surface Creek at Cedaredge, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	18	0.5	5.24	322
November	3.0	.2	.95	56.5
May	540	72	261	16,000
June	290	60	142	8,450
July	88	6.7	47.3	2,910
August	51	10	29.2	1,800
September	32	5	15.8	940

UNCOMPAHGRE RIVER AT OURAY, COLO.

LOCATION.—River: In sec. 31, T. 44 N., R. 7 W., in box canyon a short distance upstream from highway bridge half a mile south of Ouray, Ouray County. Nearest tributary, Canyon Creek, enters 150 feet below; nearest tributary above is Bear Creek.

Power-house flume: In tailrace of power-house flume in Ouray about 100 feet upstream from entrance to river. Water diverted from Uncompahgre River above river station.

DRAINAGE AREA.—44 square miles (measured on topographic map).

RECORDS AVAILABLE.—January 25, 1911, to September 30, 1922, for river station and February 25, 1916, to September 30, 1922, for power-house flume. From January 7 to March 17, 1908, records were kept at dam of Ouray Electric Light & Power Co., 1 mile south of present station.

GAGE.—River: Stevens water-stage recorder referred to vertical staff attached to rock cliff at left side of stream 150 feet above mouth of Canyon Creek: inspected by F. A. Rice.

Power-house flume: Vertical staff fastened to side of wooden flume just below power house.

DISCHARGE MEASUREMENTS.—River: Made from footbridge at gage or by wading.

Flume: Made from footbridge just below gage.

CHANNEL AND CONTROL.—River: Bed composed of small boulders. Control short distance downstream, shifting at intervals; station is in box canyon with high vertical walls.

Flume: Control is plank nailed across bottom of flume at lower end.

EXTREMES OF DISCHARGE.—River: Maximum stage during year from water-stage recorder, 3.6 feet at 10 p. m. June 13 (discharge, 840 second-feet); minimum stage, 0.28 foot at 10 a. m. December 25 (discharge, 0.5 second-foot).

1911–1922: Maximum stage recorded, 6.0 feet at 8 a. m. October 5, 1911 (discharge, 1,980 second-feet); minimum discharge, no flow February 2, 3, and 29, 1912.

ICE.—Stage-discharge relation not affected by ice, as warm springs keep streams open.

DIVERSIONS.—No diversion above station other than pipe line whose flow is included in these records.

REGULATION.—Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

ACCURACY.—River: Stage-discharge relation practically permanent. Rating curve fairly well defined. Operation of water-stage recorder satisfactory except for periods as explained in footnote to table of daily discharge. Daily discharge ascertained by applying to rating table mean daily gage-height determined by inspection of recorder graph. Records good.

Flume: Daily discharge from December 1 to April 30; July 22 to 28; and August 22 to September 13, determined from study of river charts and one daily gage height. Records good. Daily discharge for remainder of year obtained by applying poorly defined rating table to daily gage height. Records fair. Records of combined discharge or river and flume good except those for October and November, which are only fair, as the quantity diverted by the flume during the period is a large percentage of the total discharge.

Discharge measurements of Uncompahgre River at Ouray, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 14	T. J. Watkins	0.82	25.4
Feb. 26	do	.48	11.3
July 16	M. B. Arthur	1.46	106

Discharge measurements of power-house flume at Ouray, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Feb. 26	T. J. Watkins	1.10	3.5
June 12	Robert Follansbee	1.05	[a] 4.5

[a] Estimated.

Combined daily discharge, in second-feet, of Uncompahgre River and power-house flume at Ouray, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	21	21	17	15	16	19	165	230	360	76	40
2	28	24	23	20	16	13	19	179	201	279	56	33
3	26	23	15	20	16	15	21	201	224	273	60	33
4	27	24	22	18	17	15	34	207	282	273	54	34
5	28	22	21	13	18	17	29	289	391	246	51	33
6	29	18	22	15	16	15	22	380	475	227	53	35
7	29	18	22	19	18	15	20	346	514	209	51	32
8	28	18	20	16	18	18	19	274	611	199	50	39
9	27	18	20	14	19	17	20	189	615	175	48	33
10	26	18	19	15	18	15	21	131	575	160	52	34
11	26	18	20	14	17	16	20	99	514	151	49	36
12	27	18	23	14	18	16	21	75	559	147	56	35
13	27	15	23	14	16	16	18	109	607	140	49	31
14	26	12	23	14	16	17	21	114	571	129	64	28
15	25	12	22	17	15	19	24	115	461	124	47	28
16	26	10	22	14	17	17	24	100	444	116	59	28
17	26	11	17	16	18	24	20	129	469	99	69	28
18	25	12	21	22	17	23	20	182	514	99	90	28
19	25	13	22	20	15	16	23	222	521	99	65	28
20	25	14	22	21	16	19	35	240	486	95	55	28
21	25	14	21	19	16	21	62	237	465	82	49	27
22	24	14	21	28	15	28	84	232	475	73	50	28
23	24	14	20	27	15	28	97	300	475	76	49	28
24	28	13	16	25	15	22	99	371	427	76	44	27
25	22	14	21	20	15	22	97	413	357	64	40	26
26	24	13	21	20	15	23	95	423	363	66	38	26
27	23	12	21	20	15	22	101	465	371	71	38	28
28	23	14	20	19	16	19	99	475	297	68	38	29
29	32	12	20	18	-------	19	114	486	276	80	36	26
30	34	16	20	16	-------	19	158	458	300	82	36	26
31	21	-------	20	15	-------	18	-------	477	-------	83	40	-------

NOTE.—No gage-height record for river Nov. 17–20, Jan. 22–27, Feb. 2–3; discharge interpolated.

Combined monthly discharge of Uncompahgre River and power-house flume at Ouray, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	34	21	26.3	1,620
November	24	10	15.8	940
December	23	15	20.7	1,270
January	28	13	18.1	1,110
February	19	15	16.4	911
March	28	13	18.7	1,150
April	158	18	48.5	2,890
May	486	75	261	16,000
June	615	201	436	25,900
July	360	64	143	8,790
August	90	36	52.0	3,200
September	40	26	30.5	1,810
The year	615	10	90.6	65,600

UNCOMPAHGRE RIVER BELOW OURAY, COLO.

LOCATION.—In sec. 30, T. 44 N., R. 7 W., near lowest bridge in Ouray, Ouray County, a third of a mile below railroad station. Below all tributaries in Ouray.

DRAINAGE AREA.—76 square miles (measured on topographic map).

RECORDS AVAILABLE.—May 12, 1913, to September 30, 1922.

GAGE.—Gurley water-stage recorder installed March 28, 1917, referred to vertical staff attached to rock cliff 500 feet above bridge, used since March 22, 1916; inspected by F. A. Rice. Original gage, vertical staff attached to downstream side of right bridge abutment, was used prior to March 22, 1916.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders. Control is broken rock ledge 50 feet downstream on which mill tailings are alternately deposited and scoured out. Banks not subject to overflow except at extreme high-water stage of 6.5 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.8 feet at 10 a. m. June 8 (discharge, 1,450 second-feet); minimum stage, 1.44 feet at 8 a. m. March 18 (discharge, 10 second-feet).

1913–1922: Maximum discharge, 2,530 second-feet at 1 a. m. June 14, 1918; minimum discharge, 10 second-feet on February 5 and 6, 1915, and March 18, 1922.

ICE.—Stage-discharge relation not affected by ice; warm springs keep river open.

DIVERSIONS.—All diversions returned to river above station except one of 5.2 second-feet from Oak Creek.

REGULATION.—Diurnal fluctuation during spring caused by alternate melting and freezing of mountain snow. No artificial regulation.

ACCURACY.—Stage-discharge relation not permanent. Two fairly well defined rating curves used October 1 to April 19 and April 20 to September 30. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage height determined by inspection of recorder graph. Records good.

Discharge measurements of Uncompahgre River below Ouray, Colo., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 14	T. J. Watkins	1.86	44.7	June 12	Robert Follansbee	4.24	1,100
Feb. 26	do	1.65	23.9	July 16	M. B. Arthur	2.56	219
June 12	Robert Follansbee	3.75	837				

Daily discharge, in second-feet, of Uncompahgre River below Ouray, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	50	38	35	27	23	28	261	502	705	184	81
2	60	48	35	35	28	22	28	296	466	585	166	78
3	53	44	32	34	28	25	36	310	494	561	155	76
3	50	44	35	33	28	26	56	320	561	538	151	75
5	50	43	40	26	26	26	53	507	655	512	146	68
6	49	42	40	39	26	21	40	640	720	471	149	63
7	49	42	38	42	27	22	39	520	824	427	140	61
8	53	40	37	40	27	23	40	448	1,030	423	132	60
9	50	36	40	38	26	22	42	363	1,090	407	124	57
10	48	35	36	36	24	22	36	267	944	367	132	56
11	48	36	38	34	26	23	36	223	824	359	153	54
12	49	36	40	32	22	24	36	218	884	352	140	54
13	48	42	42	30	23	24	35	223	1,030	341	140	49
14	48	38	40	26	24	27	37	223	1,060	302	134	51
15	43	37	40	26	22	31	40	223	854	264	130	51
16	43	33	37	25	23	25	38	216	854	244	140	48
17	42	33	29	26	23	28	33	273	854	218	161	48
18	42	27	39	24	23	16	35	375	1,000	216	168	47
19	40	32	38	24	26	26	39	403	1,000	218	136	47
20	40	40	37	25	27	32	66	435	974	213	126	46
21	39	46	36	28	28	36	111	458	932	213	120	45
22	38	42	35	39	24	43	116	462	980	196	103	45
23	37	40	30	38	25	45	126	561	968	186	100	43
24	46	39	30	36	25	37	132	645	836	175	96	42
25	45	42	36	28	25	35	132	670	720	164	88	43
26	59	36	35	27	25	37	138	720	731	157	83	48
27	52	38	36	28	23	34	126	720	748	157	80	46
28	46	40	36	28	23	30	134	705	655	157	84	46
29	56	40	34	27	-------	29	175	690	635	186	86	43
30	64	39	36	26	-------	28	226	690	715	175	88	43
31	58	-------	36	26	-------	28	-------	610	-------	186	78	-------

NOTE.—No gage-height record Jan. 8-13 and July 14; discharge interpolated. Shifting-control method used Apr. 20 to May 1 and May 19 to July 1.

Monthly discharge of Uncompahgre River below Ouray, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	65	37	48.7	2,990
November	50	27	39.3	2,340
December	42	29	36.5	2,240
January	42	24	31.0	1,910
February	28	22	25.1	1,390
March	45	16	28.1	1,730
April	226	28	73.6	4,380
May	720	216	441	27,100
June	1,090	466	818	48,700
July	705	157	312	19,200
August	184	78	126	7,750
September	81	42	53.8	3,200
The year	1,090	16	170	123,000

UNCOMPAHGRE RIVER NEAR COLONA, COLO.

LOCATION.—In sec. 5, T. 46 N., R. 8 W., just below highway bridge 4 miles south of Colona, Ouray County. Nearest tributary, Billy Creek, enters 1½ miles downstream.

DRAINAGE AREA.—403 square miles (measured on topographic map).

RECORDS AVAILABLE.—April 26, 1903, to June 10, 1906, April 6, 1917, to September 30, 1922.

GAGE.—Friez water-stage recorder located a short distance below highway bridge; installed June, 1921. Original gage was vertical staff half a mile east of Colona and used until station was washed out June 11, 1921.

DISCHARGE MEASUREMENTS.—Made from highway bridge.

CHANNEL AND CONTROL.—Shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.21 feet at 3.30 a. m. June 14 (discharge, 1,610 second-feet); minimum discharge occurred during winter.

ICE.—Station discontinued during winter.

DIVERSIONS.—Only a few small diversions above station.

COOPERATION.—Records of daily discharge furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Uncompahgre River near Colona, Colo., for the year ending September 30, 1922

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	122	102	680	739	1,200	415	183
2	140	120	623	660	1,120	419	176
3	124	132	676	670	1,040	385	175
4	120	165	673	738	997	370	176
5	110	182	752	827	930	340	166
6	108	134	975	895	889	330	162
7	120	120	910	970	840	320	154
8	115	120	852	1,350	790	300	146
9	115	128	755	1,340	765	281	144
10	110	112	653	1,320	732	285	137
11	108	112	558	1,280	707	330	130
12	110	120	538	1,380	635	295	120
13	108	108	560	1,440	600	312	114
14	108	100	587	1,500	555	315	114
15	105	127	560	1,360	512	306	112
16	105	147	524	1,320	502	312	112
17	105	115	570	1,280	477	345	108
18	101	112	700	1,360	423	565	105
19	99	121	733	1,410	408	410	102
20	97	162	755	1,400	404	340	100
21	97	285	792	1,340	410	321	95
22	97	392	748	1,380	400	297	92
23	95	382	835	1,330	366	276	95
24	101	408	900	1,300	316	274	92
25	120	395	925	1,200	292	245	86
26	110	443	975	1,140	270	242	85
27	122	402	1,060	1,160	275	219	91
28	110	445	1,070	1,100	317	197	86
29	131	543	1,040	1,040	370	197	81
30	140	703	1,020	1,070	377	200	81
31	140	------	900	------	385	186	------

NOTE.—Quantities changed slightly to conform to computation rules used by U. S. Geol. Survey.

Monthly discharge of Uncompahgre River near Colona, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	140	95	113	6,950
April	703	100	231	13,700
May	1,070	524	771	47,400
June	1,500	660	1,180	70,200
July	1,200	270	590	36,300
August	565	186	311	19,100
September	183	81	121	7,200

NOTE.—Monthly means computed by engineers of the U. S. Geol. Survey.

UNCOMPAHGRE RIVER AT MONTROSE, COLO.

LOCATION.—In sec. 31, T. 49 N., R. 9 W., at highway bridge one-fourth mile west of Montrose, Montrose County. Nearest important tributary, Happy Canyon Creek, enters about 2 miles below.

DRAINAGE AREA.—565 square miles.

RECORDS AVAILABLE.—April 22, 1903, to September 30, 1922.

GAGE.—Vertical staff attached to bridge; read by L. R. Allen.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifts occasionally.

EXTREMES OF DISCHARGE.—No data.

ICE.—Although ice forms along banks during winter, river is not frozen over. Observations, however, are discontinued.

DIVERSIONS.—Uncompahgre River is so over-appropriated that the United States Bureau of Reclamation has constructed a tunnel and canal to divert 1,300 second-feet from Gunnison River into the Uncompahgre basin above Uncompahgre.

COOPERATION.—Daily discharge furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Uncompahgre River at Montrose, Colo., for the year ending September 30, 1922

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	50	18	868	1,000	692	118	320
2	50	18	640	800	610	125	320
3	78	18	675	490	561	548	320
4	82	18	640	640	680	520	320
5	82	18	682	823	712	520	350
6	130	12	1,080	992	585	470	350
7	130	12	500	1,080	588	470	350
8	130	13	705	1,630	590	460	264
9	130	18	582	1,280	598	490	247
10	140	105	448	1,040	602	480	191
11	230	105	357	1,140	561	500	178
12	230	105	280	1,140	542	500	159
13	208	105	400	1,180	490	510	140
14	208	105	400	1,440	520	520	126
15	190	105	357	992	500	500	126
16	190	320	357	1,000	510	533	126
17	187	300	338	1,040	520	585	126
18	115	320	675	1,060	438	838	78
19	115	320	825	1,080	438	730	72
20	115	425	850	1,120	452	635	72
21	115	470	875	950	496	542	72
22	125	520	900	905	470	542	72
23	125	520	950	1,040	470	520	72
24	130	520	1,230	960	413	530	72
25	96	338	1,080	820	438	480	55

Daily discharge, in second-feet, of Uncompahgre River at Montrose, Colo., for the year ending September 30, 1922—Continued

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
26	96	338	995	665	460	438	55
27	90	318	1,180	627	460	358	55
28	90	422	1,230	796	460	358	111
29	40	682	1,230	648	460	125	111
30	40	830	1,200	890	118	54	145
31	40	------	1,150	------	118	191	------

NOTE.—Quantities changed slightly to conform to computation rules used by U. S. Geol. Survey. No record Nov. 1 to Mar. 31.

Monthly discharge of Uncompahgre River at Montrose, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	230	40	122	7,500
April	830	12	247	14,700
May	1,230	280	764	47,000
June	1,630	490	976	58,100
July	712	118	502	30,900
August	838	54	458	28,200
September	350	55	168	10,000

NOTE.—Monthly means computed by engineers of the U. S. Geol. Survey.

UNCOMPAHGRE RIVER NEAR DELTA, COLO.

LOCATION.—In T. 15 S., on line between Rs. 95 and 96 W., at highway bridge 2 miles south of Delta, Delta County. No tributaries below station and none for several miles above.

DRAINAGE AREA.—1,110 square miles (revised; measured on map of Colorado, scale 1 : 500,000).

RECORDS AVAILABLE.—April 29, 1903, to September 30, 1922.

GAGE.—Vertical staff; read by Miss Eva Helmick.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Bed composed of silt and gravel. Control shifts at intervals. Banks are not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 4.30 feet at 7.30 a. m. May 6 (discharge, 1,450 second-feet); minimum stage, 0.85 foot at 7.30 p. m. July 14 (discharge, 20 second-feet).

ICE.—Although ice forms along banks and slush ice frequently occurs stage-discharge relation is probably not materially affected thereby; observations, however, are discontinued during winter.

DIVERSIONS.—Ditches above station divert normal flow during irrigation season; records represent largely return seepage water.

REGULATION.—None.

COOPERATION.—Daily discharge furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Uncompahgre River near Delta Colo., for the year ending September 30, 1922

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
1	203	58	930	222	288	111	161
2	200	36	585	123	334	202	163
3	200	35	1,050	117	226	152	180
4	191	118	500	121	39	168	165
5	182	120	552	121	46	158	200
6	201	85	1,180	150	74	175	172
7	250	40	1,100	472	77	168	175
8	203	41	955	930	79	147	178
9	246	212	775	785	176	150	155
10	235	160	475	615	170	152	155
11	240	130	296	343	153	181	160
12	246	126	162	355	30	168	198
13	235	103	125	355	61	175	188
14	235	103	182	555	23	198	132
15	250	103	243	420	30	188	178
16	213	49	215	335	118	198	201
17	175	47	212	190	139	170	180
18	192	42	320	493	132	419	225
19	157	48	380	536	161	443	210
20	161	72	540	560	153	472	155
21	136	116	775	562	130	355	171
22	150	280	647	402	129	342	178
23	132	280	320	630	116	311	193
24	132	160	393	562	277	342	188
25	150	91	475	472	153	280	188
26	150	280	395	332	176	230	155
27	128	251	593	422	226	176	207
28	132	208	770	332	118	207	188
29	132	220	747	392	122	192	165
30	185	220	572	412	123	187	165
31	203	-------	325	-------	101	152	-------

NOTE.—Quantities changed slightly to conform to computation rules used by U. S. Geol. Survey. No record Nov. 1 to Mar. 31.

Monthly discharge of Uncompahgre River near Delta, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	250	128	189	11,600
April	280	35	128	7,620
May	1,180	125	542	33,300
June	930	117	411	24,500
July	334	23	135	8,300
August	472	111	225	13,800
September	225	132	178	10,600

NOTE.—Monthly means computed by engineers of the U. S. Geol. Survey.

DOLORES RIVER AT BEDROCK, COLO.

LOCATION.—In sec. 17, T. 47 N., R. 18 W., at highway bridge at Bedrock, Montrose County. Nearest perennial tributary, West Paradox Creek, enters below station.

DRAINAGE AREA.—1,910 square miles (measured on Colorado Geological Survey map, scale 1:500,000).

RECORDS AVAILABLE.—April 26, 1918, to September 30, 1922, when station was discontinued.

GAGE.—Chain gage attached to upstream side of bridge; read by G. S. Ayres.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of compact sand and silt, which shifts. Control at bend of river 500 feet downstream; shifts during high water.

ICE.—Ice forms complete cover; records discontinued during winter.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.3 feet at 5.30 p. m. May 1 (discharge, 5,460 second-feet); minimum discharge, 4 second-feet during part of August and September.

1918–1922: Maximum and minimum discharge, those of the year ending September 30, 1922.

DIVERSIONS.—Water is diverted from Dolores River and tributaries above station for the irrigation of 25,500 acres, of which 20,000 acres are in Montezuma Valley. The Montezuma Valley Irrigation Co. has an adjudicated decree for diversion of 1,300 second-feet.

REGULATION.—None.

COOPERATION.—Complete records furnished by State engineer.

Daily discharge, in second-feet, of Dolores River at Bedrock, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Mar.	May	June	July	Aug.	Sept.
1	20	102	81	105	5,390	3,170	442	32	13
2	150	102	81	93	5,250	2,330	442	25	4
3	100	114	81	93	5,110	1,930	382	16	4
4	92	114	81	88	4,830	1,550	307	50	4
5	166	102	81	99	4,760	1,630	228	54	4
6	114	102	81	99	4,900	2,030	179	50	4
7	102	102	81	88	5,040	3,050	141	36	4
8	81	102	81	88	5,180	1,750	119	25	4
9	81	102	81	88	4,970	2,760	119	25	4
10	81	102	81	93	4,340	2,810	119	25	4
11	81	102	81	93	2,810	3,050	112	16	4
12	81	81	81	----	2,700	2,430	105	13	4
13	92	81	81	----	3,360	2,430	62	16	6
14	81	81	81	----	4,830	2,480	25	16	6
15	81	62	81	----	4,690	2,590	25	13	4
16	102	72	81	----	3,550	2,030	32	16	4
17	92	62	81	----	3,050	1,710	32	16	4
18	92	81	81	----	3,290	1,470	25	16	4
19	92	81	81	----	3,880	1,710	25	16	4
20	92	62	81	----	3,880	1,590	32	13	4
21	92	72	81	----	3,880	1,630	54	46	4
22	92	54	81	----	3,940	1,470	25	67	4
23	92	46	81	----	3,620	1,230	19	46	4
24	92	32	81	----	3,940	1,330	19	19	4
25	410	114	81	----	4,270	1,260	19	13	4
26	152	81	81	----	4,140	1,110	13	13	4
27	152	102	81	----	4,000	840	16	13	4
28	139	102	81	----	4,070	740	19	8	4
29	139	102	81	----	4,200	715	16	4	4
30	102	81	81	----	3,740	621	39	4	4
31	102	----	81	----	3,550	----	28	4	----

Monthly discharge of Dolores River at Bedrock, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	410	20	111	6,820
November	114	32	86.5	5,150
December			81	4,980
March 1-11	105	88	93.4	2,040
May	5,390	2,700	4,170	256,000
June	3,170	621	1,850	110,000
July	442	13	104	6,400
August	67	4	23.4	1,440
September	13	4	4.43	264

SAN MIGUEL RIVER AT NATURITA, COLO.

LOCATION.—In T. 46 N., on line between Rs. 15 and 16 west, at highway bridge in Naturita, Montrose County. Nearest tributary, Basin Creek, enters half a mile downstream

DRAINAGE AREA.—1,080 square miles (measured on map of Colorado, scale 1:500,000).

RECORDS AVAILABLE.—April 26, 1918, to September 30, 1922.

GAGE.—Chain gage fastened to upstream side of bridge; read by Mrs. A. R. Payson.

DISCHARGE MEASUREMENTS.—Made from single-span bridge or by wading.

CHANNEL AND CONTROL.—Bed rough; composed of coarse gravel and small boulders. Control at rapids 300 feet downstream; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.85 feet at 8 a. m. May 8 (discharge, 2,760 second-feet); minimum discharge, 44 second-feet on January 6.

1918–1922: Maximum stage from high-water mark during night of May 4, 1921 (discharge, 6,000 second-feet); minimum stage recorded, 0.05 foot on August 31, 1918 (discharge, 38 second-feet).

ICE.—Stage-discharge relation slightly affected by ice.

DIVERSIONS.—Court decrees for diversion of 102 second-feet from San Migue River, of which approximately 84 second-feet are above station.

REGULATION.—Diurnal fluctuation during spring from alternate melting and freezing of mountain snow.

COOPERATION.—Complete records furnished by State engineer.

Daily discharge, in second-feet, of San Miguel River at Naturita, Colo., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109	132	116	94	60	53	148	2,540	1,400	975	621	86
2	132	132	92	79	60	50	182	2,260	1,200	872	355	86
3	116	132	88	86	70	58	251	2,160	1,120	742	300	86
4	109	124	92	119	60	79	374	2,010	1,240	742	266	102
5	97	124	92	50	60	72	487	2,210	1,240	680	222	86
6	102	140	92	44	60	72	336	2,480	1,280	621	148	72
7	102	132	97	46	60	62	251	2,590	1,280	593	138	62
8	102	124	84	46	80	62	283	2,160	1,760	512	148	62
9	102	116	84	53	100	67	318	1,860	1,810	487	159	62
10	102	116	92	50	140	72	195	1,620	1,670	462	128	62

Daily discharge, in second-feet, of San Miguel River at Naturita, Colo., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
11	102	102	132	62	150	86	208	1,320	1,670	374	159	53
12	102	92	102	50	130	62	266	1,400	1,670	374	148	53
13	116	88	109	50	130	72	208	1,440	1,670	336	138	53
14	116	88	132	50	130	72	182	1,490	1,670	336	138	53
15	124	92	132	50	130	86	251	1,320	1,400	336	138	53
16	124	92	116	50	125	72	336	1,040	1,320	266	148	53
17	124	92	97	50	125	159	222	1,120	1,200	251	208	53
18	116	92	102	50	120	182	195	1,440	1,240	266	336	46
19	116	84	132	50	120	138	182	1,580	1,320	236	300	46
20	124	102	132	60	120	148	318	1,540	1,320	236	208	53
21	132	102	116	60	120	138	711	1,810	1,240	236	182	50
22	116	116	140	60	119	195	1,080	1,760	1,240	251	159	46
23	116	116	124	60	119	300	1,540	1,810	1,240	236	138	46
24	124	109	116	60	86	300	1,670	1,960	1,200	195	138	46
25	148	116	116	60	79	266	1,540	2,160	1,080	182	119	46
26	140	109	102	60	62	266	1,670	1,960	1,010	170	86	50
27	124	102	116	60	58	266	1,960	1,960	975	182	79	53
28	116	102	124	60	58	182	2,060	2,060	872	195	79	53
29	132	116	148	60	-------	148	2,210	1,860	806	208	86	53
30	132	116	159	60	-------	148	2,540	1,910	1,010	236	86	53
31	132	-------	132	60	-------	138	-------	1,720	-------	266	86	-------

Monthly discharge of San Miguel River at Naturita, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	148	97	118	7,260
November	140	84	110	6,550
December	159	84	113	6,950
January	119	44	59.6	3,660
February	150	58	97.5	5,410
March	300	50	131	8,060
April	2,540	148	739	44,000
May	2,590	1,040	1,820	112,000
June	1,810	806	1,310	78,000
July	975	170	389	23,900
August	621	79	182	11,200
September	102	46	59.3	3,530
The year	2,590	44	429	311,000

GREEN RIVER BASIN

GREEN RIVER NEAR DANIEL, WYO.

LOCATION.—Near line between Tps. 32 and 33 N., R. 110 W., at highway bridge 6 miles southeast of Daniel, Sublette County. No large tributary within several miles.

DRAINAGE AREA.—932 square miles (measured on map of Wyoming issued by United States Geological Survey; scale 1:500,000).

RECORDS AVAILABLE.—April 1, 1915, to September 30, 1922. State engineer maintained station at this point during 1913 and 1914.

GAGE.—Chain gage on downstream side of bridge; read by Mrs. A. P. Sommers.

DISCHARGE MEASUREMENTS.—Made from two-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and small boulders. Control 100 feet downstream at small rapids; shifts slightly. Banks are high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.1 feet at 4.30 p. m. June 15 (discharge, 4,010 second-feet); minimum discharge occurred during winter.

1915–1922: Maximum stage recorded, 7.0 feet at 10 a. m. June 16, 1918 (discharge, 8,750 second-feet); minimum discharge occurred during winter.

ICE.—Stage-discharge relation seriously affected by ice; observations discontinued during winter.

DIVERSIONS.—Adjudicated diversions for irrigation of 18,000 acres above station.

REGULATION.—None, except natural regulation of Green River lakes.

ACCURACY.—Stage-discharge relation shifted slightly during winter. Two fairly well defined rating curves used October 1 to November 19 and April 24 to September 30. Gage read to quarter-tenths once daily. Daily discharge ascertained by applying daily gage height to rating tables. Records fair except for periods of missing gage heights, for which they are poor.

Discharge measurements of Green River near Daniel, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 10	3.68	1,740
June 20	4.67	3,130
Sept. 25	2.22	283

Daily discharge, in second-feet, of Green River near Daniel, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	385	213	-------	626	2,380	2,480	680	635
2	375	207	-------	810	2,380		725	635
3	365	201	-------	964	2,380		820	635
4	355	195	-------	1,620	2,380		820	592
5	345	190	-------	1,680	2,530	2,000	870	635
6	336	185	-------	2,170	2,700		870	635
7	327	180	-------	3,000	2,870		820	635
8	318	175	-------	2,170	3,140		772	635
9	309	175	-------	1,630	3,310		680	635
10	309	185	-------	1,760	3,610		680	680
11	300	190	-------	1,490	3,820		680	
12	300	195	-------	1,250	3,610		725	
13	300	207	-------	1,250	3,700		725	
14	300	219	-------	1,250	3,910	1,150	725	
15	300	219	-------	1,360	4,010		820	470
16	219	201	-------	1,860	3,800		820	
17	219	195	-------	2,450	3,570		870	
18	219	195	-------	3,050	3,370		870	
19	219	195	-------	2,770	3,180		920	
20	219	-------	-------	2,430	3,090	840	1,030	
21	219	-------	-------	2,430	3,000		1,080	
22	219	-------	-------	2,510	3,090		1,030	
23	219	-------	-------	2,580	3,180		1,030	370
24	219	-------	653	2,750	3,090	920	975	
25	219	-------	528	2,840	3,000	820	820	278
26	219	-------	618	2,930	2,910	772	772	
27	219	-------	498	3,000	2,820	772	725	
28	219	-------	707	2,560	2,740	725	680	260
29	219	-------	707	2,100	2,650	725	680	
30	219	-------	662	2,100	2,560	725	680	
31	213	-------	-------	2,100	-------	725	635	

NOTE.—Shifting-control method used Apr. 24 to June 16. No gage-height record July 2–23, Sept. 11–24, and 26–30; discharge based on comparison with flow of New Fork near Boulder and Green River at Green River. Braced figures show mean discharge for periods indicated. No record Nov. 20 to Apr. 23.

Monthly discharge of Green River near Daniel, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	385	213	272	16,700
November 1–19	219	175	196	7,380
April 24–30	707	528	625	8,680
May	3,050	626	2,050	126,000
June	4,010	2,380	3,090	184,000
July		725	1,240	76,200
August	1,080	635	807	49,600
September			470	28,000

GREEN RIVER AT GREEN RIVER, WYO.

LOCATION.—In sec. 22, T. 18 N., R. 107 W., at Union Pacific Railroad pumping station, 100 feet below railroad bridge at Green River, Sweetwater County. No tributary within several miles.

DRAINAGE AREA.—7,670 square miles (measured on map of United States Geological Survey, scale 1:500,000).

RECORDS AVAILABLE.—May 2, 1895, to October 31, 1906; March 1, 1915, to September 30, 1922.

GAGE.—Chain gage on left bank at pumping station; read by Miss Alyce Craver. From March 1, 1915, to September 28, 1920, gage one-third of a mile downstream. Gage used from 1895 to 1906 was vertical staff on submerged cribbing near present location. No determined relation between gages.

DISCHARGE MEASUREMENTS.—Made from two-span highway bridge.

CHANNEL AND CONTROL.—Bed composed of small boulders. Control of well compacted small boulders 400 feet downstream; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.85 feet at 8 a. m. June 12 (discharge, 13,300 second-feet); minimum discharge occurred during winter.

1895–1906; 1915–1922: Maximum stage recorded, 12.3 feet at 5 p. m. June 19, 1918 (discharge, 22,200 second-feet); minimum discharge recorded, 160 second-feet, November 17, 1898.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 223 second-feet between this station and the station near Daniel.

REGULATION.—None.

ACCURACY.—Stage-discharge relation shifted slightly. Rating curve fairly well defined. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table except period July 19 to August 31, when shifting-control method was used. Records good.

Discharge measurements of Green River at Green River, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 2	3.54	4,220
15	3.21	2,900
June 17	5.70	12,400
July 29	2.74	2,030

Daily discharge, in second-feet, of Green River at Green River, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	770	690		1,560	4,090	8,570	9,820	1,830	1,560
2	770	690		1,470	4,090	8,570	8,570	1,830	1,560
3	770	770		2,600	3,510	8,570	7,760	1,830	1,560
4	770	730		1,320	3,790	8,570	7,360	1,830	1,560
5	770	770		950	4,090	8,570	6,190	1,830	1,560
6	770	770		1,320	4,560	8,980	5,080	1,830	1,470
7	770	770		1,320	5,810	11,100	4,730	1,830	1,400
8	770	770		1,250	5,810	11,100	3,940	1,830	1,400
9	770	770		3,380	6,000	11,600	3,510	1,830	1,400
10	770	770		2,360	5,620	12,100	3,240	1,740	1,400
11	770	770		1,180	4,730	13,000	3,240	1,740	1,400
12	770	770		1,060	3,940	13,000	3,110	1,560	1,320
13	770	770		950	3,510	12,600	2,980	1,640	1,180
14	770	770		810	3,110	12,100	2,980	1,740	1,060
15	770	770		950	2,980	12,100	2,980	1,740	1,000
16	770	770		1,060	3,240	12,100	2,980	2,140	1,000
17	770	770		770	3,240	12,600	2,980	1,930	950
18	770	770	3,110	730	3,510	11,600	2,600	1,930	950
19	770	770	3,380	950	4,730	11,100	2,390	1,930	950
20	770	770	3,650	1,120	5,440	11,100	2,270	2,030	950
21	730	770	3,380	1,560	6,190	11,100	1,970	2,030	950
22	690	770	3,110	1,470	6,190	11,100	1,970	2,030	950
23	690	730	2,850	1,740	6,580	11,100	1,990	2,030	900
24	690	690	2,720	1,930	6,580	11,100	1,990	2,030	850
25	690	690	2,600	2,360	6,970	11,100	2,010	2,030	770
26	690	690	2,480	2,850	7,760	11,100	2,010	2,030	770
27	690	690	2,480	3,510	8,160	11,100	2,140	2,030	770
28	690	620	2,250	4,090	8,980	11,100	2,140	1,930	770
29	690	620	2,250	4,090	8,160	10,700	2,050	1,740	770
30	690	620	2,140	3,940	8,160	10,200	1,950	1,640	770
31	690		1,930		8,160		1,850	1,640	

Monthly discharge of Green River at Green River, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	770	690	743	45,700
November	770	620	736	43,800
March 18-31	3,650	1,930	2,740	76,100
April	4,090	730	1,820	108,000
May	8,980	2,980	5,410	333,000
June	13,000	8,570	11,000	655,000
July	9,820	1,850	3,570	220,000
August	2,140	1,560	1,860	114,000
September	1,560	770	1,130	67,200

GREEN RIVER AT LITTLE VALLEY, NEAR GREEN RIVER, UTAH

LOCATION.—In sec. 4, T. 22 S., R. 16 E., 1 mile above old Little Valley ferry and 6 miles downstream from Green River, Emery County. San Rafael River enters Green River 16 miles downstream in sec. 25, T. 23 S., R. 16 E.

DRAINAGE AREA.—41,000 square miles (measured in 1915, on best available maps of Colorado River basin).

RECORDS AVAILABLE.—December 18, 1910, to September 30, 1922. Records obtained at Green River (known also as Elgin or Blake) from 1894 to 1899 and 1905 to 1911 give practically the same flow.

GAGE.—Stevens continuous water-stage recorder on left bank 1 mile above old ferry; inspected by A. I. Anderson.

DISCHARGE MEASUREMENTS.—Made from car on old ferry cable.

CHANNEL AND CONTROL.—Bed composed of gravel and sand. Fairly permanent gravel riffle two-thirds of a mile below gage. Banks high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage during year, 10.80 feet at 1 p. m. June 12 (discharge, 46,200 second-feet); minimum discharge, 955 second-feet (estimated mean for the day) on January 9.

1894–1899; 1905–1922: Maximum discharge recorded, 68,800 second-feet, May 29, 1897; minimum stage recorded, −0.95 foot December 1, 1919 (discharge, 510 second-feet).

ICE.—Stage-discharge relation affected by ice nearly every winter.

DIVERSIONS.—Station is below practically all diversions from Green River.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed slightly November 19 to December 6; no ice effect apparent this year. Rating curves well defined between 1,500 and 50,000 second-feet. Operation of water-stage recorder satisfactory except January 8 to February 16, April 17 and 18, May 24–26, May 30 to June 8, June 22 to July 31, and August 25 and September 9; when staff was read. Daily discharge ascertained by applying mean daily gage height or daily reading to rating table. Records good.

COOPERATION.—Since December 16, 1917, station has been maintained in cooperation with Utah Power & Light Co., which made most of the discharge measurements.

Discharge measurements of Green River at Little Valley, near Green River, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Nov. 17	E. G. Thorum [a]	1.42	2,490	June 9	E. G. Thorum	9.82	39,200
Dec. 8	R. R. Rowe	1.21	2,300	11	do	10.62	46,300
Feb. 16	E. G. Thorum	1.39	2,310	July 11	do	4.14	8,620
May 16	do	6.32	21,100	13	do	3.79	8,390
18	do	6.31	19,500				

[a] Engineer of Utah Power & Light Co.

Daily discharge, in second-feet, of Green River at Little Valley, near Green River, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,280	2,280	2,690	2,500	1,900	3,010	6,060	11,500	45,600	21,700	4,060	4,650
2	2,260	2,390	2,620	2,580	1,800	2,830	5,530	13,000	44,400	20,000	4,900	4,290
3	2,230	2,500	2,600	2,580	1,900	2,740	5,270	14,000	43,200	18,400	3,830	4,180
4	2,200	2,500	2,500	2,500	1,800	2,420	5,020	14,800	40,200	16,800	4,060	4,060
5	2,180	2,500	2,450	2,280	1,850	2,210	5,140	15,300	38,400	15,800	4,180	3,940
6	2,220	2,500	2,450	2,280	2,080	2,210	5,140	16,000	38,400	14,300	4,060	3,940
7	2,220	2,450	2,420	2,080	2,210	2,280	5,790	17,600	38,600	13,200	3,610	3,940
8	2,310	2,420	2,280	1,690	2,350	2,350	6,610	19,800	39,000	11,800	3,610	3,830
9	2,590	2,370	2,100	955	1,850	2,350	6,760	22,500	40,200	10,800	3,400	3,520
10	2,590	2,350	1,540	1,060	1,850	2,350	7,360	29,000	43,200	9,990	3,400	3,200
11	2,500	2,370	1,350	1,260	2,210	2,500	7,510	31,000	45,200	9,590	3,720	3,100
12	2,450	2,370	1,260	1,370	2,350	2,500	7,050	30,200	45,800	8,850	3,400	3,010
13	2,420	2,340	1,290	1,410	3,010	2,500	6,900	28,400	44,600	8,000	3,300	2,920
14	2,430	2,320	1,500	1,690	3,200	2,660	6,330	24,500	43,200	7,510	3,300	2,740
15	2,450	2,340	1,780	1,740	3,200	3,010	5,790	21,700	41,600	6,760	3,100	2,660
16	2,450	2,370	1,980	2,080	2,350	3,200	5,270	20,300	39,800	6,470	3,400	2,580
17	2,400	2,470	1,940	1,740	2,210	4,180	4,980	20,300	36,900	6,200	3,200	2,500
18	2,350	2,480	1,540	1,960	2,080	7,050	4,700	20,300	35,100	5,790	2,920	2,420
19	2,320	2,500	1,540	1,540	2,080	17,600	4,410	21,400	34,200	5,270	2,920	2,350
20	2,290	2,470	1,610	1,450	2,140	19,000	4,290	23,900	35,100	4,900	3,400	2,280

Daily discharge, in second-feet, of Green River at Little Valley, near Green River, Utah, for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	2,240	2,400	2,030	1,540	2,280	12,500	4,290	27,900	36,300	4,650	4,530	2,210
22	2,230	2,400	2,280	1,740	2,920	10,600	4,290	31,000	35,700	4,180	5,660	2,140
23	2,220	2,450	2,880	1,640	2,830	9,790	4,290	33,000	35,700	3,940	8,680	2,140
24	2,540	2,420	3,100	1,450	3,010	10,200	4,530		35,400	3,830	5,530	2,080
25	2,760	2,570	3,360	1,450	3,200	12,000	5,020	36,700	33,000	3,940	5,090	2,020
26	2,280	2,520	2,970	1,540	3,400	12,500	6,330		30,700	3,940	4,650	2,020
27	2,290	2,600	2,410	1,640	3,720	11,100	7,670	40,400	28,700	3,830	4,060	1,960
28	2,310	2,710	2,220	1,540	3,500	9,590	8,850	42,000	26,400	3,830	3,830	1,960
29	2,260	2,780	2,110	1,690	-------	8,000	9,590	42,600	25,000	4,060	3,940	1,960
30	2,240	2,760	2,290	1,800	-------	7,200	10,600	43,400	23,100	4,060	4,180	1,960
31	2,220	-------	2,460	1,590	-------	6,610	--------	44,000	--------	4,060	4,290	-------

NOTE.—Braced figures show estimated mean discharge for period indicated.

Monthly discharge of Green River at Little Valley, near Green River, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,760	2,180	2,350	144,000
November	2,780	2,280	2,460	146,000
December	3,360	1,260	2,180	134,000
January	2,580	955	1,750	108,000
February	3,720	1,800	2,470	137,000
March	19,000	2,210	6,420	395,000
April	10,600	4,290	6,050	360,000
May	44,000	11,500	26,800	1,650,000
June	45,800	23,100	37,400	2,230,000
July	21,700	3,830	8,600	529,000
August	8,680	2,920	4,070	250,000
September	4,650	1,960	2,890	172,000
The year	45,800	955	8,630	6,250,000

EAST FORK AT EAST FORK CANAL, WYO.

LOCATION.—In sec. 10, T. 31 N., R. 106 W., 300 feet above intake of East Fork Canal, 18 miles southeast of Boulder, Sublette County. Nearest tributary, Canal Creek, enters just below.

DRAINAGE AREA.—106 square miles (measured on base map of Wyoming, scale 1 : 500,000).

RECORDS AVAILABLE.—During irrigation seasons of 1916, 1917, 1921, and 1922.

GAGE.—Vertical staff on left bank; read by Robert Hawkins.

DISCHARGE MEASUREMENTS.—Made from cable near gage or by wading.

CHANNEL AND CONTROL.—Bed composed of small boulders; control 100 feet downstream, apparently permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during irrigation season, 4.3 feet at 10 a. m. June 10 (discharge, 1,180 second-feet); minimum stage, 0.75 foot on September 30 (discharge, 4 second-feet).

1916, 1917, 1921, and 1922: Maximum stage, 4.6 feet June 23 and 25, 1917 (discharge, 1,400 second-feet); minimum stage, that of 1922.

ICE.—No data, as records are discontinued during winter.

DIVERSIONS.—Prior to July 1, 1921, there were adjudicated diversions of 26 second-feet above station.

REGULATION.—Flow regulated to small extent by many small lakes at headwaters.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined below 1,000 second-feet. Gage read to half-tenths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records good except during high water, when the mean daily gage height based on one reading may be considerably in error. For this period records considered fair.

Discharge measurements of East Fork at East Fork Canal, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
June 21	3.79	828
Sept. 28	.80	5.0

Daily discharge, in second-feet, of East Fork at East Fork Canal, Wyo., for the irrigation season of 1922

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	655	285	51	22	16	900	115	51	8
2	710	285	51	18	17	835	97	44	8
3	770	255	51	12	18	900	106	38	10
4	835	242	51	15	19	770	97	32	6
5	1,040	230	51	15	20	770	97	32	6
6	1,110	242	44	15	21	868	97	38	7
7	970	270	38	12	22	835	97	44	6
8	1,110	230	32	12	23	682	89	32	6
9	1,040	205	27	10	24	550	81	27	6
10	1,180	180	27	8	25	500	81	27	5
11	655	168	38	15	26	435	73	18	5
12	770	115	51	8	27	398	65	18	6
13	900	97	38	8	28	398	58	18	5
14	868	97	97	7	29	330	51	15	5
15	835	97	73	8	30	285	58	18	4
					31		51	18	

Monthly discharge of East Fork at East Fork Canal, Wyo., for the irrigation season of 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June	1,180	285	763	45,400
July	285	51	139	8,550
August	97	15	38.4	2,360
September	22	4	9.3	553
The period				56,900

EAST FORK AT NEWFORK, WYO.

LOCATION.—About sec. 33, T. 32 N., R. 108 W., at highway bridge a quarter of a mile south of Newfork, Sublette County. No tributaries between station and mouth, 1 mile below.

DRAINAGE AREA.—348 square miles (measured on map of Wyoming, scale 1 : 500,000).

RECORDS AVAILABLE.—April 1, 1905, to October 31, 1906; May 11, 1915, to September 30, 1922.

GAGE.—Vertical staff on downstream side of left abutment; read by J. W. Glaze. Gage a quarter of a mile upstream used during 1905; gage used during 1906 located at bridge and referred to datum 0.27 foot higher than present gage.

DISCHARGE MEASUREMENTS.—Made from two-span highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel. Control 100 feet downstream at gravel bar which is slightly shifting. Banks subject to overflow at stage of 6 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 6.1 feet at 7 a. m. June 10 (discharge, 2,460 second-feet); minimum discharge occurred during winter.

1915–1922: Maximum discharge 2,940 second-feet on June 19, 1917; minimum discharge, 25 second-feet at 6 p. m. April 4, 1920.

ICE.—Stage-discharge relation seriously affected by ice; observations discontinued.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 141 second-feet above station.

REGULATION—Flow regulated to small extent by many small lakes at headwaters.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records excellent.

Discharge measurements of East Fork at Newfork, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 8	2.29	272
June 22	4.02	934
Sept. 27	1.17	47.8

Daily discharge, in second-feet, of East Fork at Newfork, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	49	48	49	211	1,540	226	65	71
2	49	48	49	226	1,400	184	66	70
3	49	48	48	348	1,540	172	70	68
4	48	48	51	402	1,750	149	66	69
5	48	48	51	348	1,900	160	65	72
6	48	48	52	259	2,060	149	64	71
7	48	48	48	242	2,140	138	61	69
8	48	48	48	276	2,220	128	61	66
9	48	48	50	259	2,300	114	62	62
10	48	48	51	226	2,380	111	65	58
11	48	48	49	195	1,750	98	64	56
12	48	48	48	160	1,610	92	64	54
13	48	48	48	138	1,540	86	68	54
14	48	48	46	136	1,400	81	84	52
15	48	48	47	130	1,470	76	71	51
16	48	49	46	128	1,070	72	71	51
17	48	49	46	172	1,010	76	68	51
18	48	49	46	259	1,190	80	66	51
19	48	49	46	402	1,190	81	64	51
20	48	49	46	456	1,070	85	70	51

Daily discharge, in second-feet, of East Fork at Newfork, Wyo., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
21	48	49	46	512	1,070	90	70	51
22	48	49	48	607	900	84	71	51
23	48	49	55	685	810	85	69	51
24	52	48	65	950	685	85	68	51
25	51	48	72	1,260	568	81	68	51
26	51	49	86	1,680	512	76	68	51
27	49	49	102	1,610	456	71	68	51
28	49	51	128	1,470	402	70	69	51
29	49	52	149	1,750	366	68	69	51
30	48	52	198	1,820	312	65	68	51
31	48	-------	-------	1,750	-------	65	69	-------

Monthly discharge of East Fork at Newfork, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	52	48	48.5	2,980
November	52	48	48.7	2,900
April	198	46	63.8	3,800
May	1,820	128	615	37,800
June	2,380	312	1,290	76,800
July	226	65	103	6,330
August	84	61	67.5	4,150
September	72	51	56.9	3,390

NEW FORK NEAR BOULDER, WYO.

LOCATION.—About sec. 8, T. 32 N., R. 108 W., at highway bridge 1 mile west of Boulder, Sublette County. Nearest tributary, Boulder Creek, enters one-eighth of a mile below.

DRAINAGE AREA.—578 square miles (measured on map of Wyoming, scale 1:500,000).

RECORDS AVAILABLE.—May 11, 1915, to September 30, 1922.

GAGE.—Vertical staff on downstream side of left abutment; read by Martin Brandt.

DISCHARGE MEASUREMENTS.—Made from two-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel underlain by slate; somewhat shifting. No well-defined control. At high water there are two overflow channels, one around right end of bridge and other from New Fork to Boulder Creek.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.2 feet from 5.30 a. m. June 23 to 7 a. m. June 24 (discharge, 3,420 second-feet); minimum discharge occurred during winter.

1915–1922: Maximum stage recorded, 8.7 feet at 6 a. m. June 17, 1918 (discharge, 12,300 second-feet); minimum discharge of 42 second-feet occurred from December 15–17, 1915.

ICE.—Stage-discharge relation seriously affected by ice; observations discontinued.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 191 second-feet above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of New Fork near Boulder, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 8	3.26	586
June 21	6.05	3,040

Daily discharge, in second-feet, of New Fork near Boulder, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	118	92	-------	422	1,420	2,210	445	358
2	113	92	-------	400	1,600	2,100	422	358
3	109	88	-------	605	1,600	2,000	422	338
4	109	88	-------	1,080	1,700	1,800	422	338
5	104	88	-------	1,080	1,900	1,700	422	338
6	100	88	-------	1,080	2,210	1,600	400	338
7	100	84	-------	550	2,430	1,500	400	338
8	96	88	-------	578	2,540	1,420	400	318
9	96	84	-------	550	2,770	1,240	400	318
10	92	84	-------	495	2,890	1,160	400	318
11	92	84	-------	445	2,890	1,080	400	318
12	88	77	-------	400	2,890	1,010	400	318
13	84	70	-------	445	2,890	935	400	318
14	84	70	-------	400	3,010	795	470	338
15	80	77	-------	400	3,130	665	470	338
16	84	80	-------	400	3,130	665	445	338
17	84	67	-------	379	3,010	605	422	318
18	84	77	-------	400	2,890	578	445	318
19	84	-------	-------	445	3,010	665	445	298
20	84	-------	122	470	3,130	665	470	279
21	84	-------	127	605	3,130	635	470	279
22	84	-------	137	730	3,270	665	445	260
23	96	-------	158	795	3,420	665	445	260
24	100	-------	169	795	3,270	730	445	242
25	104	-------	181	865	3,130	665	422	201
26	92	-------	194	935	2,890	635	400	194
27	84	-------	224	1,160	2,770	605	379	194
28	84	-------	298	1,080	2,540	550	358	194
29	84	-------	318	1,160	2,430	495	358	194
30	84	-------	400	1,240	2,320	495	358	188
31	96	-------	-------	1,420	-------	795	358	-------

Monthly discharge of New Fork near Boulder, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	118	80	92.8	5,710
November 1–18	92	67	82.1	2,930
April 20–30	400	122	212	4,630
May	1,420	379	704	43,300
June	3,420	1,420	2,670	159,000
July	2,210	495	1,010	62,100
August	470	358	417	25,600
September	358	188	292	17,400

PINE CREEK AT PINEDALE, WYO.

LOCATION.—In sec. 4, T. 33 N., R. 109 W., at highway bridge at Pinedale, Sublette County. No large tributary between station and mouth, 3 miles below.

DRAINAGE AREA.—128 square miles (measured on United States Geological Survey map, scale 1:500,000).

RECORDS AVAILABLE.—May 8, 1915, to September 30, 1922.

GAGE.—Vertical staff on downstream side of bridge pier; read by D. C. Carson. Prior to August 17, 1917, vertical staff a quarter of a mile downstream on left bank; no determined relation between gages.

DISCHARGE MEASUREMENTS.—Made from two-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel. Control at rapids just below gage; somewhat shifting. Banks subject to overflow at extremely high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.0 feet June 22–24 (discharge, 1,500 second-feet); minimum discharge occurred during winter.

1915–1922: Maximum stage, 5.0 feet at 8 a. m. and 5 p. m., June 17, 1918 (discharge, 2,310 second-feet); minimum discharge, occurred during winter.

ICE.—Stage-discharge relation somewhat affected by ice.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 73 second-feet above Pinedale and 4 second-feet below.

REGULATION.—Flow regulated by Fremont Lake, which has an area of approximately 8 square miles and drains 110 square miles.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table except periods April 21 to May 18 and May 28 to September 30 when shifting-control method was used. Records fair.

Discharge measurements of Pine Creek at Pinedale, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 9	1.37	77
June 20	3.60	1,220
Sept. 25	1.38	56

Daily discharge, in second-feet, of Pine Creek at Pinedale, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	24	6	------	18	534	1,090	262	176
2	20	6	------	18	534	1,050	230	166
3	18	5	------	18	554	1,020	218	162
4	18	5	------	33	623	952	198	162
5	18	5	------	35	658	882	186	210
6	17	5	------	42	714	882	183	239
7	17	5	------	46	819	812	172	244
8	17	5	------	61	924	812	158	239
9	16	5	------	73	980	742	155	234
10	15	5	------	80	1,050	672	146	230
11	14	5	------	78	1,120	602	149	222
12	14	5	------	78	1,180	534	131	214
13	13	5	------	75	1,250	502	131	202
14	13	4	------	75	1,250	471	162	190
15	11	4	------	80	1,230	411	165	183
16	11	4	------	78	1,230	411	169	165
17	10	4	------	82	1,230	411	186	155
18	8	------	------	98	1,220	411	183	149
19	8	------	------	118	1,220	404	239	137
20	7	------	------	152	1,290	397	248	125
21	6	------	17	183	1,430	389	248	85
22	6	------	17	190	1,500	381	226	69
23	8	------	17	198	1,500	373	218	63
24	10	------	17	234	1,500	365	202	59
25	8	------	17	285	1,430	340	190	55
26	8	------	17	320	1,360	315	183	59
27	7	------	17	365	1,360	295	180	57
28	6	------	17	365	1,290	270	169	55
29	6	------	17	393	1,220	270	162	54
30	6	------	17	423	1,150	266	155	48
31	6	------	------	471	------	266	155	------

NOTE.—No gage-height record July 19–23; discharge interpolated.

Monthly discharge of Pine Creek at Pinedale, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	24	6	11.8	726
November 1–17	6	4	4.9	165
April 21–30	17	17	17	337
May	471	18	154	9,470
June	1,500	534	1,110	66,000
July	1,090	266	548	33,700
August	262	131	186	11,400
September	244	48	147	8,750

BOULDER CREEK NEAR BOULDER, WYO.

LOCATION.—In sec. 4, T. 32 N., R. 108 W., at Sandlin ranch, 2 miles northwest of Boulder, Sublette County. No tributary between station and mouth 2 miles below.

DRAINAGE AREA.—112 square miles (measured on United States Geological Survey map; scale 1:500,000).

RECORDS AVAILABLE.—April 23, 1904, to October 31, 1906; May 10, 1915, to September 30, 1922.

GAGE.—Chain gage installed May 19, 1920, 50 feet upstream from vertical staff used prior to that date and referred to same datum; read by Mrs. M. M. Sandlin. Gage used 1904–1906 was located a short distance upstream.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge 1¾ miles downstream during high water.

CHANNEL AND CONTROL.—Bed composed of gravel; deep pool at gage. Control 150 feet downstream at rapids which shift slightly at intervals. Banks are high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.8 feet on June 10 (discharge, 2,340 second-feet); minimum stage, probably occurred during winter.

1904–1906; 1915–1922: Maximum stage recorded, 6.8 feet on June 14, 1918 (discharge, 3,240 second-feet); minimum discharge, 0.9 second-foot on August 31, 1915.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 83 second-feet above station.

REGULATION.—Natural regulation by Boulder Lake. Low-water discharge affected by irrigation above station.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 2,400 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of Boulder Creek near Boulder, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 8	1.91	146
Sept. 26	.66	[a] 6

[a] Estimated.

Daily discharge, in second-feet, of Boulder Creek near Boulder, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	8	7	38	1,140	675	68	29
2	8	7	49	1,140	625	67	28
3	7	7	58	1,280	580	62	27
4	7	7	81	1,420	535	60	26
5	7	6	103	1,700	495	58	23
6	7	6	115	1,930	495	54	22
7	7	6	122	1,930	455	51	19
8	7	6	134	2,010	395	49	18
9	7	6	151	2,180	335	47	15
10	7	6	143	2,340	284	44	15
11	7	6	132	2,090	226	40	15
12	7	6	126	1,930	187	41	13
13	7	6	113	1,930	124	41	12
14	7	6	108	1,930	134	48	12
15	7	6	101	2,090	134	58	11
16	7	6	92	1,850	143	60	11
17	7	6	79	1,700	164	62	10
18	7	------	92	1,930	164	62	9
19	7	------	143	2,010	154	60	9
20	7	------	245	2,090	154	54	9

Daily discharge, in second-feet, of Boulder Creek near Boulder, Wyo., for the year ending September 30, 1922—Continued

Day	Oct.	Apr.	May	June	July	Aug.	Sept.
21	7	-------	307	2,090	154	50	8
22	7	-------	375	2,180	154	46	9
23	7	-------	443	2,010	143	53	8
24	8	-------	553	1,700	134	52	7
25	8	-------	741	1,420	120	50	7
26	8	-------	900	1,210	110	50	7
27	7	-------	972	1,140	99	46	7
28	6	-------	960	1,020	86	41	7
29	6	-------	960	900	78	38	7
30	7	29	1,080	785	76	35	7
31	7	-------	1,210	-------	67	32	-------

Monthly discharge of Boulder Creek near Boulder, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8	6	7.1	437
November 1-17	7	6	6.2	209
May	1,210	38	346	21,300
June	2,340	785	1,700	101,000
July	675	67	248	15,200
August	68	32	50.9	3,130
September	29	7	13.6	809

BIG SANDY CREEK NEAR FARSON, WYO.

LOCATION.—In sec. 18, T. 27 N., R. 106 W., three-quarters of a mile below Ten Trees and 18 miles north of Farson, Sweetwater County. No tributary within several miles.

DRAINAGE AREA.—322 square miles (measured on United States Geological Survey map; scale, 1 : 500,000).

RECORDS AVAILABLE.—May 10, 1915, to September 30, 1917; April 28, 1921, to September 30, 1922.

GAGE.—Stevens eight-day water-stage recorder at left bank, half a mile above head gate of Eden Canal, installed May 1, 1921, and referred to datum of staff gage used from 1915 to 1917; inspected by employee of Eden Land & Irrigation Co.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet upstream from gage or by wading.

CHANNEL AND CONTROL.—Bed composed of well-compacted sand; control 150 feet downstream, fairly permanent. Banks are overflowed at stage of 3.7 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.8 feet from 2 to 7 a. m. June 9 (discharge, 766 second-feet); minimum stage 1.10 feet at noon September 24 (discharge, 4 second-feet).

1915–1917; 1921–1922: Maximum discharge recorded, 1,160 second-feet on June 26, 1917; minimum discharge that of September 24, 1922.

ICE.—Stage-discharge seriously affected by ice.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 43 second-feet above station and 4 second-feet below.

REGULATION.—None.

ACCURACY.—Stage-discharge relation shifted slightly. Two fairly well defined rating curves used October 1 to June 11 and June 12 to September 30. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating tables mean daily gage heights obtained by inspection of recorder graph. Records good.

Discharge measurements of Big Sandy Creek near Farson, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 6	2.35	128
June 19	4.05	545
July 31	1.92	44.1

Daily discharge, in second-feet, of Big Sandy Creek near Farson, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	12	32	-------	554	326	42	13
2	14	34	-------	486	300	42	14
3	16	34	-------	514	274	42	15
4	22	31	-------	568	254	41	15
5	25	32	-------	622	241	46	14
6	26	31	128	662	236	46	11
7	26	-------	122	676	234	42	12
8	25	-------	117	704	217	40	12
9	26	-------	113	738	203	34	11
10	26	-------	109	710	185	33	10
11	26	-------	105	704	171	28	9
12	26	-------	99	556	150	28	8
13	26	-------	93	556	134	37	10
14	26	-------	87	556	116	89	7
15	26	-------	89	556	105	67	6
16	25	-------	79	556	103	77	6
17	25	-------	78	488	105	82	5
18	25	-------	118	488	105	79	5
19	26	-------	196	542	103	64	6
20	26	-------	268	542	100	59	6
21	26	-------	340	542	96	53	6
22	27	-------	392	529	96	52	6
23	26	-------	419	542	96	50	4
24	25	-------	608	502	94	47	4
25	25	-------	594	448	91	41	5
26	26	-------	581	408	82	35	6
27	31	-------	594	394	75	31	6
28	32	-------	540	380	72	25	6
29	35	-------	554	380	61	18	6
30	34	-------	594	354	54	15	7
31	32	-------	594	-------	46	14	-------

Monthly discharge of Big Sandy Creek near Farson, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	35	12	25.6	1,570
November 1–6	34	31	32.3	384
May 6–31	608	78	293	15,100
June	738	354	542	32,300
July	326	46	146	8,980
August	89	14	45.1	2,770
September	15	4	8.4	500

BLACKS FORK NEAR URIE, WYO.

LOCATION.—In sec. 23, T. 16 N., R. 115 W., at highway bridge, 4 miles northwest of Urie, Uinta County. No tributary within 10 miles.

DRAINAGE AREA.—261 square miles (measured on United States Geological Survey map; scale 1 : 500,000).

RECORDS AVAILABLE.—August 21, 1913, to September 30, 1922.

GAGE.—Vertical staff on downstream side of center pier; read by Miss Myrtle Anderson.

DISCHARGE MEASUREMENTS.—Made from two-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of well-compacted gravel. Control is small rapids just below bridge; shift slightly at long intervals. Right bank high and not subject to overflow; left bank is overflowed at stage of about 3 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.95 feet at 8.30 a. m. May 26 (discharge, 1,690 second-feet); minimum discharge, 6 second-feet for several days in October and September.

1913–1922: Maximum stage recorded, 4.72 feet at 7 p. m. June 19 and 9 a. m. June 20, 1917 (discharge, 2,680 second-feet); minimum discharge 1 second-foot September 17–22, 1916.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 636 second-feet above station, and 4 second-feet below.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table except for periods April 19 to June 5 and July 6 to September 30, for which shifting-control method was used. Records good.

Discharge measurements of Blacks Fork near Urie, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 4	1.85	237
Sept. 30	.62	10.6

Daily discharge, in second-feet, of Blacks Fork near Urie, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	13	13		180	857	300	14	19
2	13	13		195	857	230	16	14
3	8	13		224	668	245	25	11
4	6	13		221	728	280	16	9
5	6	13		269	668	186	11	9
6	6	13		269	740	84	8	9
7	6	13		369	680	68	7	9
8	6	13		415	590	53	7	9
9	8	13		369	1,010	46	7	9
10	8	13		288	838	46	11	9
11	8	13		221	680	40	8	10
12	13	13		192	620	30	7	10
13	13	13		178	620	20	8	10
14	13	13		178	620	10	12	10
15	13	13		192	455	8	12	10
16	13			392	360	7	8	7
17	18		58	662	740	9	8	7
18	18		54	440	505	9	8	6
19	18		60	602	620	6	8	6
20	18		60	602	560	7	8	6
21	22		175	560	650	15	8	6
22	24		256	450	650	13	8	6
23	24		221	614	590	15	8	7
24	24		221	766	405	15	8	6
25	18		233	1,130	380	13	8	6
26	20		266	1,480	360	10	7	6
27	22		280	844	340	13	8	6
28	18		280	844	330	24	8	6
29	18		242	1,140	315	10	7	13
30	18		183	982	310	10	9	7
31	15			387		10	13	

NOTE.—No gage-height record June 25–30 and July 9–15; discharge based on comparison with flow of Hams Fork at Diamondville. No record Nov. 16 to Apr. 16.

Monthly discharge of Blacks Fork near Urie, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	24	6	14.5	892
November 1–15	13	13	13.0	387
April 17–30	280	54	185	5,140
May	1,480	178	505	31,000
June	1,010	310	592	35,200
July	300	7	59.1	3,630
August	25	7	9.7	596
September	19	6	8.6	512

HAMS FORK AT DIAMONDVILLE, WYO.

LOCATION.—In SW. ¼ sec. 24, T. 21 N., R. 116 W., at highway bridge at Diamondville, Lincoln County. Nearest tributary, Willow Creek, enters 4 miles upstream.

DRAINAGE AREA.—386 square miles (revised; measured on United States Geological Survey map, scale 1:500,000).

RECORDS AVAILABLE.—October 1, 1918, to September 30, 1922. From May 1 to September 30, 1918, station maintained at Kemmerer 2 miles upstream; records at two points comparable.

GAGE.—Vertical staff fastened to downstream end of center pier; read by P. R. Thomassen.

DISCHARGE MEASUREMENTS.—Made from two-span bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of small boulders and well-compacted gravel. Control 200 feet downstream at small rapids composed of well-compacted gravel; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 4.05 feet at 5 p. m. May 6 (discharge, 2,050 second-feet); minimum discharge probably occurred during winter.

1918–1922: Maximum stage recorded, 4.4 feet at 8 a. m. May 23, 1920 (discharge, 2,980 second-feet); minimum discharge, river dry August 29–31, 1919.

ICE.—Stage-discharge relation seriously affected by ice; observations discontinued during winter.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 50 second-feet above station and 112 second-feet below.

REGULATION.—None.

ACCURACY.—Stage-discharge relation shifted slightly. Two well-defined rating curves used October 1 to November 30 and March 19 to September 30. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating tables. Records good except for discharges of more than 1,200 second-feet, for which they are fair.

Discharge measurements of Hams Fork at Diamondville, Wyo., during the year ending September 30, 1922

[Made by M. B. Arthur]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 13	3.07	543
June 16	3.24	694
July 30	1.98	53

Daily discharge, in second-feet, of Hams Fork at Diamondville, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	49		35	500	1,120	247	50	38
2	34	46		54	575	1,120	238	51	38
3	35	44		54	705	1,050	220	56	41
4	35	43		54	855	1,050	205	56	41
5	35	41		45	1,290	975	179	54	41
6	36	42		51	1,700	975	167	45	41
7	38	42		54	1,930	1,050	152	42	42
8	36	42		57	1,480	1,120	122	36	40
9	35	42		56	1,290	1,050	102	29	39
10	35	38		51	855	975	112	29	37
11	36	33		51	750	975	105	31	35
12	36	33		51	575	855	85	36	28
13	36	38		51	538	855	79	40	28
14	36	44		51	750	750	77	119	27
15	36	44		51	855	750	61	102	24
16	36	46		56	855	750	51	57	24
17	36	26		56	975	660	51	48	24
18	36	25		57	1,290	575	45	40	24
19	36	30	16	51	1,820	575	42	37	27
20	36	35	19	45	1,930	538	50	68	28

Daily discharge, in second-feet, of Hams Fork at Diamondville, Wyo., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	36	41	22	57	1,820	500	54	61	25
22	36	43	36	94	1,700	468	56	57	25
23	38	33	57	126	1,480	435	59	137	25
24	42	23	105	152	1,480	402	79	75	25
25	66	25	36	193	1,480	370	57	50	25
26	70	29	50	256	1,590	315	61	42	24
27	55	34	50	290	1,590	315	56	40	26
28	52	37	40	315	1,480	270	59	32	31
29	46	41	32	370	1,120	270	56	36	35
30	44	39	32	500	1,120	260	57	36	31
31	49	-------	32	-------	1,120	-------	51	42	-------

NOTE.—Stage-discharge relation affected by ice Nov. 18–20, 23, 25, 26, 28; discharge interpolated. Shifting-control method used Sept. 1–30. No record Dec. 1 to Mar. 18.

Monthly discharge of Hams Fork at Diamondville, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	70	33	40.2	2,470
November	49	23	37.6	2,240
March 19–31	105	16	40.5	1,040
April	500	35	113	6,720
May	1,930	500	1,210	74,400
June	1,120	260	712	42,400
July	247	42	97.9	6,020
August	137	29	52.7	3,240
September	42	24	31.3	1,860

LITTLE SNAKE RIVER NEAR DIXON, WYO.

LOCATION.—In sec. 6, T. 12 N., R. 90 W., at highway bridge 1 mile west of Dixon, Carbon County. No important tributary within several miles.

DRAINAGE AREA.—1,060 square miles (measured on United States Geological Survey map; scale, 1:500,000).

RECORDS AVAILABLE.—May 27, 1910, to September 30, 1922.

GAGE.—Chain gage on upstream side of bridge; read by Mrs. J. E. Herold.

CHANNEL AND CONTROL.—Shifting during high water.

EXTREMES OF DISCHARGE.—Maximum gage height recorded, 7.2 feet at noon May 27 (discharge, 5,860 second-feet); minimum stage recorded, 0.65 foot from August 5–8 (discharge, 22 second-feet).

1910–1922: Maximum mean daily stage recorded, 8.3 feet on May 23, 1920 (discharge, 8,960 second-feet); minimum stage recorded, 0.2 foot on August 6, 1911 (discharge, 5 second-feet).

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversion above station of 68 second-feet in Wyoming and 33 second-feet in Colorado; below station, 68 second-feet in Wyoming and 54 second-feet in Colorado.

REGULATION.—None.

COOPERATION.—Complete records furnished by State engineer of Colorado.

Discharge measurements of Little Snake River near Dixon, Wyo., during the year ending September 30, 1922

[Made by B. T. Chase]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 27	7.00	5,560
Aug. 12	.75	28.6

Daily discharge, in second-feet, of Little Snake River near Dixon, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	54	-------	184	1,820	3,280	233	24	28
2	38	54	-------	196	1,600	3,070	176	24	28
3	41	54	-------	254	2,000	2,940	162	24	28
4	46	54	-------	299	2,060	2,940	140	23	28
5	51	54	-------	444	2,490	2,940	140	22	28
6	87	54	-------	490	2,810	2,880	108	22	28
7	136	54	-------	318	3,630	2,810	103	22	28
8	136	46	-------	326	3,630	3,070	80	22	28
9	156	38	-------	318	2,810	2,940	64	23	28
10	162	38	-------	310	2,250	2,940	64	24	26
11	169	38	-------	274	2,740	2,740	64	24	26
12	146	51	-------	274	1,420	2,620	64	24	26
13	115	58	-------	233	1,340	2,310	64	24	26
14	100	64	-------	218	1,510	2,000	61	24	24
15	79	64	-------	204	1,700	1,650	57	24	24
16	54	70	-------	190	2,060	1,340	50	24	24
17	54	74	-------	184	2,680	1,290	50	24	24
18	54	64	-------	196	3,490	1,210	48	24	24
19	54	64	-------	176	4,060	1,250	40	25	24
20	51	70	-------	233	4,440	1,210	40	108	24
21	38	64	-------	299	4,660	1,010	35	103	24
22	38	64	780	435	4,210	978	31	68	24
23	38	70	780	694	4,060	842	28	45	24
24	38	70	810	810	4,360	722	28	40	24
25	46	64	307	810	4,580	588	28	33	24
26	46	54	288	1,010	4,810	467	28	27	24
27	46	54	338	1,010	5,110	379	26	26	24
28	51	54	233	1,170	4,660	318	26	26	24
29	54	58	218	1,420	4,810	288	24	26	24
30	54	64	204	1,700	4,510	274	24	26	34
31	54	-------	184	-------	3,770	-------	24	26	-------

NOTE.—No record Dec. 1 to Mar. 21.

Monthly discharge of Little Snake River near Dixon, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	169	38	73.5	4,520
November	74	38	57.8	3,440
March 22–31	810	184	41.4	8,210
April	1,700	184	489	29,100
May	5,110	1,340	3,230	199,000
June	3,280	274	1,780	106,000
July	233	24	68.1	4,190
August	108	22	32.3	1,990
September	34	24	25.8	1,540

LITTLE SNAKE RIVER NEAR LILY, COLO.

LOCATION.—In sec. 20, T. 7 N., R. 98 W., at highway bridge near mouth of canyon 6 miles above Lily, Moffat County. No tributary between station and mouth of river at Lily.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1 to September 30, 1922.

GAGE.—Remodeled Bristol.

DISCHARGE MEASUREMENTS.—Made from bridge and by wading.

CHANNEL AND CONTROL.—Fairly permanent.

DIVERSIONS.—Adjudicated diversions for irrigation of 28,700 acres between Dixon and Lily stations.

REGULATION.—None

COOPERATION.—Complete records furnished by State engineer.

Daily discharge, in second-feet, of Little Snake River near Lily, Colo., for the year ending September 30, 1922

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	2,400	3,980	306	40	20	16	2,450	2,160	96	46	26
2	2,400	3,770	236	52	20	17	2,450	1,740	96	46	28
3	2,400	3,560	206	40	20	18	3,560	1,610	96	28	26
4	2,400	3,350	180	52	20	19	3,980	1,480	80	28	24
5	2,450	3,350	156	52	19	20	4,400	1,360	80	28	22
6	2,960	3,560	134	52	18	21	4,840	1,250	80	114	20
7	3,560	3,350	134	52	17	22	5,360	1,080	66	96	19
8	4,400	3,150	114	52	18	23	4,400	1,010	66	52	18
9	4,400	3,350	114	46	19	24	3,980	940	66	52	17
10	3,980	3,350	114	46	20	25	4,400	870	66	40	16
11	2,450	3,560	114	46	19	26	4,840	800	66	28	15
12	2,960	3,150	114	46	18	27	5,360	664	66	20	14
13	2,160	2,960	96	52	17	28	5,650	544	66	20	16
14	2,020	2,780	114	40	20	29	5,090	438	52	20	17
15	2,300	2,450	80	40	23	30	5,360	346	40	20	17
						31	4,840	-------	40	20	-------

Monthly discharge of Little Snake River near Lily, Colo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May	5,650	2,020	3,680	226,000
June	3,980	346	2,200	131,000
July	306	40	108	6,640
August	114	20	44.1	2,710
September	28	14	19.4	1,150
The period	----------	----------	----------	368,000

SAVERY CREEK AT SAVERY, WYO.

LOCATION.—About in sec. 8, T. 12 N., R. 89 W., half a mile east of Savery, Carbon County. No tributary between station and mouth, 1½ miles below.

DRAINAGE AREA.—354 square miles (measured on United States Geological Survey map, scale 1:500,000).

RECORDS AVAILABLE.—May 1, 1915, to September 30, 1916; April 5, 1918, to September 30, 1922, when station was discontinued.

GAGE.—Vertical staff; read by Marie Kilgore.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.5 feet at 6.30 p. m. May 7 (discharge, 1,090 second-feet); minimum stage recorded 0.8 foot on several days during October and August (discharge, 9 second-feet).

1915–1916; 1918–1922: Maximum stage recorded, 5.7 feet on May 19, 21, 22, 1920 (discharge, 1,770 second-feet); no flow July 6 to September 3, 1915, August 5, 6, 9–31, and September 1–14, 1918.

DIVERSIONS.—Prior to July 1, 1921, adjudicated diversions of 64 second-feet from Savery Creek, and 13 second-feet from tributaries entering above.

REGULATION.—None.

COOPERATION.—Complete records furnished by State engineer of Colorado.

Discharge measurements of Savery Creek at Savery, Wyo., during the year ending September 30, 1922

[Made by B. T. Chase]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
May 27	3.88	808
Aug. 11	.95	15.0

Daily discharge, in second-feet, of Savery Creek at Savery, Wyo., for the year ending September 30, 1922

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	40	-------	124	616	508	76	18	50
2	18	40	-------	62	616	508	76	18	50
3	18	40	-------	124	671	508	76	13	50
4	18	40	-------	124	768	508	69	16	50
5	13	40	-------	124	854	508	62	16	50
6	13	40	-------	142	854	400	62	13	50
7	13	40	-------	175	900	400	62	9	50
8	13	40	-------	220	994	400	62	9	40
9	13	32	-------	220	994	400	62	13	40
10	13	32	-------	220	900	400	50	13	40
11	13	32	-------	220	994	400	45	13	18
12	9	32	-------	124	854	400	40	13	18
13	9	32	-------	124	854	400	36	11	18
14	9	40	-------	92	768	328	32	9	18
15	9	50	-------	62	768	292	32	9	18
16	9	32	-------	124	810	256	32	9	18
17	9	32	-------	124	728	188	28	9	18
18	24	32	-------	124	728	188	28	9	18
19	24	32	472	124	709	188	28	13	18
20	32	32	472	124	690	175	24	13	24
21	40	32	472	124	690	162	24	13	24
22	40	32	580	142	728	162	28	13	24
23	40	32	490	152	728	92	28	13	24
24	40	32	472	220	748	84	24	13	24
25	40	32	472	472	728	76	18	13	24
26	40	32	472	472	690	76	18	13	24
27	40	32	418	472	728	76	18	50	24
28	40	32	346	472	690	76	18	50	24
29	40	32	124	472	690	76	13	50	40
30	40	32	124	472	690	76	13	50	40
31	40	-------	124	-------	690	-------	13	50	-------

NOTE.—No record Dec. 1 to Mar. 18.

Monthly discharge of Savery Creek at Savery, Wyo., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	40	9	23.8	1,460
November	50	32	35.0	2,080
March 19–31	580	124	388	9,990
April	472	62	208	12,400
May	994	616	770	47,300
June	508	76	277	16,500
July	76	13	38.6	2,370
August	50	9	18.5	1,140
September	50	18	30.9	1,840

ASHLEY CREEK NEAR VERNAL, UTAH

LOCATION.—In sec. 1, T. 3 S., R. 20 E., three-quarters of a mile above heading of power canal of Vernal Milling & Light Co., 4 miles above mouth of Dry Fork, and 12 miles northwest of Vernal, Uinta County.

DRAINAGE AREA.—101 square miles (measured on topographic map).

RECORDS AVAILABLE.—June 6, 1914, to September 30, 1922. From October 8, 1911, to June 5, 1914, fragmentary records were obtained at power plant. Records are also available for a point below mouth of Dry Fork from March 15, 1900, to December 31, 1904.

GAGE.—Stevens continuous water-stage recorder on left bank three-quarters of a mile above heading of power canal; inspected by Adam Erickson and William Thomas.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Bed steep and rough; composed of gravel and cobbles and subject to change during high water. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.67 feet at 7 p. m. June 8 (discharge, about 1,700 second-feet); minimum stage recorded, 4.38 feet March 2–13, 20–23, (discharge, 35 second-feet).

1911–1922: Maximum discharge, 2,050 second-feet at 9 p. m. May 29, 1921; minimum discharge, 26 second-feet, February 7, 1920.

ICE.—None.

DIVERSIONS.—None above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water. Rating curve used October 1 to May 19 well defined below 300 second-feet; extended above. Rating curve used June 12 to September 30 fairly well defined below 700 second-feet. Water-stage recorder operated satisfactorily except as indicated in footnote to daily-discharge table. Daily discharge determined by applying to rating table mean daily gage height determined from recorder graph. Shifting-control method used during high water. Discharge for periods of no gage heights interpolated, or estimated from hydrographic comparison with record for Whiterocks Creek. Records for low water, good; for high water, fair.

Discharge measurements of Ashley Creek near Vernal, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 7	W. E. Dickinson	4.74	91.0	June 17	W. E. Dickinson	7.96	700
Jan. 23	do	4.43	41.2	Sept. 5	A. B. Purton	6.35	107
June 4	do	7.55	1,030				

Daily discharge, in second-feet, of Ashley Creek near Vernal, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	70	50	45	39	36	37	79	1,060	299	120	111
2	88	70	50	45	38	35	37	83	1,070	263	116	105
3	88	69	50	44	38	35	37	92	1,080	242	116	103
4	88	69	50	44	38	35	37	101	1,110	233	116	103
5	88	67	49	44	38	35	40	203	1,120	225	114	107
6	90	67	49	44	38	35	40	305	1,160	208	112	107
7	90	65	49	43	38	35	40	470	1,260	198	116	102
8	90	64	49	43	38	35	40	460	1,410	185	111	96
9	88	62	49	43	38	35	40	322	1,480	175	112	95
10	88	60	49	43	38	35	40	250	1,280	168	116	95
11	85	59	49	42	38	35	40	213	1,130	158	112	95
12	85	59	49	42	38	35	40	213	974	151	134	93
13	85	59	49	42	38	35	38	203	882	145	114	93
14	83	59	49	42	38	36	38	228	822	143	128	91
15	81	58	47	42	38	36	38	246	762	151	112	91
16	81	59	47	42	38	36	38	285	702	140	109	90
17	79	58	45	42	38	37	38	445	756	134	105	88
18	78	56	45	42	38	36	38	770	840	132	103	88
19	76	53	46	42	38	36	38	770	804	128	103	88
20	74	54	46	42	38	35	38	750	768	126	105	86
21	72	56	47	41	38	35	40	750	750	128	107	84
22	70	56	47	41	38	35	42		696	126	111	84
23	70	56	47	41	37	35	45		620	148	107	90
24	69	56	46	41	37	38	47	870	525	128	105	93
25	70	56	46	40	37	40	50		470	122	107	95
26	69	56	46	40	37	40	54		425	118	130	93
27	69	54	45	40	37	40	56	988	387	114	114	90
28	69	53	45	40	36	40	59	1,040	354	118	111	88
29	69	53	45	39	-------	38	65	1,110	335	112	116	86
30	70	52	45	39	-------	37	74	1,040	339	109	109	86
31	70	-------	45	39	-------	37	-------	1,020	-------	107	105	-------

NOTE.—No gage heights Jan. 21, 22, 24–26, 28–31, Feb. 1, 2, 4–9, May 20–26; discharge estimated. Braced figures show estimated mean discharge for period indicated.

Monthly discharge of Ashley Creek near Vernal, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	90	69	79.4	4,880
November	70	52	59.5	3,540
December	50	45	47.4	2,910
January	45	39	41.9	2,580
February	39	36	37.8	2,100
March	40	35	36.2	2,230
April	74	37	43.5	2,590
May	1,110	79	541	33,300
June	1,480	335	846	50,300
July	299	107	159	9,780
August	134	103	113	6,950
September	111	84	93.9	5,590
The year	1,480	35	175	127,000

VERNAL MILLING & LIGHT CO.'S TAILRACE NEAR VERNAL, UTAH

LOCATION.—In NW. ¼ sec. 18, T. 3 S., R. 21 E., at power plant of Vernal Milling & Light Co., 10 miles northwest of Vernal, Uinta County.

RECORDS AVAILABLE.—May 3 to September 30, 1917, and March 18, 1920, to September 30, 1922.

GAGE.—Indicating gage in office of power plant, actuated by float in stilling well in tailrace beneath plant; read by employees of power company.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Channel straight for 50 feet below gage. Banks high; one channel at all stages. Bed composed of gravel and cobbles; fairly permanent.

ICE.—None.

ACCURACY.—Stage-discharge relation changed between January 24 and June 5. Rating curves well defined between 15 and 35 second-feet. Gage read to hundredths hourly. Daily discharge ascertained by applying mean daily gage height to rating table except for days when plant was not operating continuously; for which days hourly discharge was used. Shifting-control method used from January 1 to May 31. Discharge February 19 estimated from kilowatt-hour output of plant. Records good, except period of shifting control, which is fair.

COOPERATION.—Gage-height record furnished by Vernal Milling & Light Co.

Discharge measurements of Vernal Milling & Light Co.'s tailrace near Vernal, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 8	W. E. Dickinson	4.70	28.8	June 17	W. E. Dickinson	4.88	31.5
Jan. 24	do	4.58	23.8	Sept. 5	A. B. Purton	4.77	26.7
June 4	do	4.51	17.8				

Daily discharge, in second-feet, of Vernal Milling & Light Co.'s tailrace near Vernal, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	27	29	23	26	17	21	20	24	25	15	22
2	22	27	27	24	26	25	13	22	23	20	23	22
3	26	27	28	27	25	25	21	21	22	22	23	19
4	27	27	23	27	25	26	22	21	19	20	23	20
5	27	27	28	27	23	21	23	22	23	21	23	22
6	26	18	28	25	26	23	22	21	23	25	19	22
7	27	27	28	25	24	25	22	17	21	26	22	22
8	27	28	27	23	26	23	22	20	19	17	23	22
9	23	26	28	25	26	23	20	22	0	20	20	23
10	26	27	28	25	26	23	21	22	0	23	23	18
11	27	24	24	24	27	22	21	21	0	25	23	22
12	26	27	27	25	23	20	21	22	11	26	22	22
13	27	23	26	25	25	22	20	23	7	24	13	23
14	27	27	26	24	25	22	21	18	8	24	17	23
15	27	27	26	23	25	24	20	20	2	24	21	23
16	23	27	26	25	26	24	19	21	10	20	20	21
17	24	28	27	27	26	25	20	20	12	23	20	19
18	24	26	24	27	25	25	20	21	7	24	20	19
19	25	28	28	25	17	21	20	16	7	24	21	22
20	25	24	28	25	26	25	20	21	10	24	19	22
21	25	29	29	25	26	25	20	16	13	24	20	23
22	25	28	28	23	25	23	20	21	10	23	8	22
23	23	27	28	25	25	22	12	21	0	19	12	23
24	27	24	28	25	26	22	20	22	8	20	20	19
25	27	28	24	25	26	22	20	23	11	23	21	21

Daily discharge, in second-feet, of Vernal Milling & Light Co.'s tailrace near Vernal, Utah, for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
26	27	27	24	26	22	14	21	24	12	23	22	21
27	26	23	28	26	26	21	22	23	2	23	19	21
28	27	28	27	26	26	22	22	18	17	24	20	21
29	27	29	27	23	-------	21	22	23	21	23	21	22
30	16	27	28	27	-------	21	12	20	25	19	18	23
31	27	-------	27	26	-------	22	-------	24	-------	19	23	-------

Monthly discharge of Vernal Milling & Light Co.'s tailrace near Vernal, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	27	16	25.5	1,570
November	29	18	26.4	1,570
December	29	23	26.9	1,650
January	27	23	25.1	1,540
February	27	17	25.0	1,390
March	26	17	22.5	1,380
April	23	12	20.0	1,190
May	24	16	20.8	1,280
June	25	0	12.2	726
July	26	17	22.5	1,380
August	23	8	19.8	1,220
September	23	18	21.5	1,280
The year	29	0	22.4	16,200

NORTH FORK OF DUCHESNE RIVER NEAR HANNA, UTAH

LOCATION.—In NW. ¼ NE. ¼ sec. 35, T. 2 N., R. 9 W., Uinta special base and meridian, 250 feet below Hades Creek, 6 miles above confluence with West Fork, and 10 miles northwest of Hanna, Duchesne County.

DRAINAGE AREA.—75 square miles (measured on topographic map).

RECORDS AVAILABLE.—August 16, 1921, to September 30, 1922.

GAGE.—Vertical enamel staff on left bank 10 feet downstream from cable; read by V. R. Savage.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Channel straight for half a mile above gage; makes sharp turn to left 50 feet below gage. One channel at all stages. Bed of gravel and small boulders. Right bank high. Left bank lower but probably not subject to overflow. Well defined riffle control immediately below gage; permanent. Stage of zero flow −0.8 foot as determined October 1, 1921.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 4.65 feet at 8 p. m. June 8 and 9 (discharge, 1,490 second-feet); minimum stage not recorded.

ICE.—Stream probably freezes over at times each winter.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent, except as affected by ice. Rating curve well defined below 1,000 second-feet; extended above. Gage read to hundredths once or twice daily except as stated in footnote to daily-discharge table. Daily discharge determined by applying mean daily gage height to rating table. Discharge for periods of missing gage height estimated or interpolated. Records for periods of gage-height record good; others fair.

Discharge measurements of North Fork of Duchesne River near Hanna, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 1	W. E. Dickinson	0.83	34.5
Jan. 12	do	[a].96	17.7
Sept. 14	A. B. Purton	.77	30.7

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of North Fork of Duchesne River near Hanna, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35			23			24	101	915	285	200	
2	34						24	140	925	257	200	
3	33	25					26	149	925		200	56
4	33						25	124	1,070		195	
5	32		22				24	154	1,160		192	48
6	32	25		20			26	140	1,320	277	189	45
7	33	24					26	149	1,360		186	43
8	32	23					25	132	1,420		186	41
9	31	23					26	108	1,490			39
10	31	24	24				26	101	1,410			39
11	31	23	20				26	94	1,130	297	146	35
12	31			18			24	101	1,190	288		34
13	31						26	128	1,080	279		32
14	31						25	149	875	279	105	30
15	31				20		26	176	682	279	103	29
16	29					22	25	225	635	279	101	28
17	28						26	297	975	278	99	27
18	28						26	431	777	277		27
19	28						43	446	1,080	276		27
20	27		22				48	423	1,130	275	90	27
21	27	23		20			39	412	1,130	274		26
22	26						50	466	1,130	275	80	26
23	26						65	607	1,030	276	79	26
24	39						68	739	635	277	78	26
25							50	836	518	277		26
26	26						80	836	500		72	26
27							80	787	458			30
28							52	806	419	238		31
29	26				-------		52	855	479		65	29
30	26		23		-------		120	831	382		65	28
31	26	-------	23		-------		-------	895	-------		65	-------

NOTE.—No gage heights Oct. 2-4, 21, 25-28, 30, 31, Nov. 1-5, 12-30, Dec. 1-9, 12-29, Jan. 2-11, 13-31, Feb. 1 to Apr. 1, July 3-10, 12, 14, 17-20, 22, 23, 26-31, Aug. 1, 2, 5, 6, 9-13, 15, 16, 18-21, 23, 25-28, Sept. 1-4, 7, 12, 13, and 15. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of North Fork of Duchesne River near Hanna, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	39	26	29.7	1,830
November			23.5	1,400
December			22.1	1,360
January			20.0	1,230
February			20.0	1,110
March			22.0	1,350
April	120	24	40.1	2,390
May	895	94	382	23,500
June	1,490	382	941	56,000
July			270	16,600
August	200	65	121	7,440
September		26	35.0	2,080
The year	1,490		161	116,000

DUCHESNE RIVER NEAR TABIONA, UTAH

LOCATION.—In SW. ¼ sec. 17, T. 2 S., R. 6 W., Uinta special base and meridian, at highway bridge 8 miles southeast of Tabiona, Duchesne County, and 5½ miles above Rock Creek.

DRAINAGE AREA.—352 square miles.

RECORDS AVAILABLE.—January 16, 1919, to September 30, 1922.

GAGE.—Stevens steel tape gage on downstream side of bridge; installed March 8, 1920; read by Lyman Duke.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Channel composed of gravel and sand. Left bank high and not subject to overflow. Right bank is overflowed at extreme high stage allowing water to pass around bridge. Gravel riffle 100 feet below gage forms control.

EXTREMES OF DISCHARGE.—Maximum stage (from high-water mark) 14.4 feet about June 9 (discharge estimated, 2,350 second-feet); minimum discharge occurred during ice period.

1919–1922: Maximum discharge, about 2,500 second-feet on June 13, 1921 (uncertain because gage readings for that time are doubtful and river was over right bank); minimum discharge probably less than 70 second-feet in January, 1919, when river was frozen over.

ICE.—River freezes over each winter.

DIVERSIONS.—Some small diversions for irrigation above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water May 25 to June 14. Rating curves fairly well defined. Gage read to hundredths once daily except May 25 to June 14 when tape gage was broken. Daily discharge ascertained by applying daily gage height to rating tables, except for periods of ice effect January 8 to February 18, February 28, March 1–3, and 5–10, which were estimated from one measurement, observer's notes, temperature records, and comparison with flow of Duchesne River at Duchesne. Discharge for period May 25 to June 14 estimated from comparison with flow of Duchesne River at Duchesne. Records good.

Discharge measurements of Duchesne River near Tabiona, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	W. E. Dickinson	9.72	172	June 15	W. E. Dickinson	13.0	1,410
Jan. 10	do	[a] 9.9	141	Sept. 13	A. B. Purton	9.94	162

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Duchesne River near Tabiona, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	180	153	140	126			121	280		824	222	209
2	182	151	142	132		110	125	298		792	233	244
3	179	155	142	125			121	378		760	225	233
4	175	153	142	118		116	123	402		688	217	225
5	167	151	140	115			125	469	2,200	593	207	220
6	164	153	140	115			118	657		539	204	202
7	160	153	142	110		110	120	785		511	194	192
8	157	153	144				116	820		471	197	182
9	148	151	142	105			115	702		456	192	180
10	148	151	142		100		113	581	2,300	433	220	175
11	146	149	140			115	115	493		422	209	175
12	142	149	137			118	112	434		366	189	171
13	144	148	135	85		115	110	395	1,860	349	173	164
14	144	149	133			115	113	448		332	166	168
15	140	146	130			118	118	465	1,410	307	168	171
16	140	146	128			115	126	545	1,310	292	171	171
17	144	146	126			115	108	752	1,120	280	202	160
18	142	144	132			116	121	1,000	1,120	272	197	155
19	140	142	135		115	115	126	1,120	1,200	307	207	149
20	140	144	142		115	113	137	1,040	1,220	301	252	143
21	142	142	146		113	112	162	1,030	1,280	286	230	141
22	142	140	142		115	113	211	1,030	1,250	310	209	137
23	149	139	139		115	115	190	1,170	1,180	286	192	135
24	171	139	135	80	115	116	213	1,330	1,170	244	187	133
25	177	140	132		115	116	240		1,120	228	182	133
26	153	142	133		115	121	251		1,030	222	175	153
27	157	142	133		115	125	275	2,000	879	252	244	164
28	153	142	130		110	123	288		851	269	255	151
29	155	142	128		-------	121	278		874	228	233	141
30	153	140	128		-------	125	273		833	212	238	137
31	153	-------	126		-------	123	-------		-------	199	236	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Duchesne River near Tabiona, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	182	140	154	9,470
November	155	139	146	8,690
December	146	126	136	8,360
January	132	----------	92.3	5,680
February	----------	----------	105	5,830
March	125	----------	115	7,070
April	288	108	159	9,460
May	----------	280	988	60,800
June	----------	833	1,580	94,000
July	824	199	388	23,900
August	255	166	207	12,700
September	244	133	170	10,100
The year	----------	----------	354	256,000

DUCHESNE RIVER AT DUCHESNE, UTAH

LOCATION.—In NE. ¼ NW. ¼ sec. 1, T. 4 S., R. 5 W., Uinta special base and meridian, at Seventh Street Bridge in Duchesne, Duchesne County, a mile above mouth of Strawberry River.

DRAINAGE AREA.—660 square miles.

RECORDS AVAILABLE.—December 3, 1917, to September 30, 1922.

GAGE.—Chain gage on downstream handrail of bridge near right bank; read by E. S. Winslow.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 100 feet above and several hundred feet below gage. Bed composed of gravel and cobbles. Head of a long heavy gravel riffle is a short distance below gage. Banks are low but not subject to overflow. Stage of zero flow at gage height 2.6 feet as determined August 4 and 18, 1921.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.65 feet at noon June 10 (discharge, 4,420 second-feet); minimum discharge probably less than 160 second-feet in latter part of January when stage-discharge relation was affected by ice.

1918–1922: Maximum discharge, that of June 10, 1922; minimum discharge, 53 second-feet July 29 and August 23–27, 1919.

ICE.—Stream freezes every winter.

DIVERSIONS.—Below all diversions above mouth of Strawberry River; numerous diversions above and below station.

REGULATION.—None except by diversion.

ACCURACY.—Stage-discharge relation changed during high water about June 13; affected by ice January 8 to March 20. Rating curves poorly defined. Gage read to half-tenths or hundredths once a day. Daily discharge ascertained by applying daily gage height to rating table except for period of ice effect which was estimated from temperature records, observer's notes, and hydrographic study of flow at this station in conjunction with that of Duchesne River at Myton, Strawberry River at Duchesne, and Lake Fork near Myton. Discharge interpolated for October 1. Records for low and high stages fair; those for medium stages may be poor.

Discharge measurements of Duchesne River at Duchesne, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 2	W. E. Dickinson	4.37	258	Jan. 25	W. E. Dickinson	[a] 4.50	155
Jan. 13	do	[a] 4.45	191	June 14	do	8.55	4,020
17	do	[a] 4.47	166	Sept. 7	A. B. Purton	5.34	296

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Duchesne River at Duchesne, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250	269	248	290			236	550	4,090	1,860	480	400
2	251	266	248	290			230	515	4,090	1,620	570	365
3	245	260	224	284			236	670	3,960	1,440	440	300
4	245	260	224	284			242	870	4,160	1,440	400	400
5	254	242	230	275			310	1,140	4,280	1,320	400	365
6	245	242	224	260			290	1,670	4,280	1,260	400	344
7	245	242	224	230			266	1,770	4,220	1,210	400	270
8	245	242	224				275	2,120	4,220	1,160	365	270
9	236	242	224				266	2,230	4,160	990	365	270
10	236	242	254				275	1,870	4,420	880	365	245
					200	225						
11	236	245	260	200			266	1,620	4,160	825	330	245
12	230	245	260				245	1,620	3,840	825	330	245
13	230	245	254				260	1,470	3,960	770	330	220
14	230	245	254				275	1,520	4,090	670	365	220
15	239	248	254				260	1,570	3,560	670	330	200
16	239	248	254				260	1,620	3,170	620	330	200
17	245	245	215				275	1,820	3,300	620	270	200
18	245	245	230				275	2,230	3,300	570	270	200
19	245	245	245				230	2,560	3,880	525	270	200
20	245	254	275				254	2,560	3,880	720	300	200
21	239	254	284			245	275	2,450	3,720	570	365	200
22	239	254	290			260	290	2,620	3,660	570	365	200
23	239	254	290			260	310	2,620	3,330	720	400	180
24	272	245	290	160		245	350	3,180	3,040	570	400	180
25	260	245	290		230	260	395	3,600	2,840	525	330	180
26	275	245	275			260	420	3,900	2,520	525	300	200
27	272	245	284			260	450	3,780	2,280	400	270	200
28	275	245	284			245	515	3,840	2,100	480	365	200
29	275	245	284		-------	230	515	3,960	2,160	440	400	270
30	266	245	275		-------	230	550	4,020	2,040	400	400	245
31	269	-------	290		-------	224	-------	3,960	-------	440	440	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Duchesne River at Duchesne, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	275	230	249	15,300
November	269	242	248	14,800
December	290	215	257	15,800
January	290	----------	196	12,100
February	----------	----------	209	11,600
March	260	----------	233	14,300
April	550	230	310	18,400
May	4,020	515	2,260	139,000
June	4,420	2,040	3,560	212,000
July	1,860	400	827	50,800
August	570	270	366	22,500
September	400	180	247	14,700
The year	4,420	----------	747	541,000

DUCHESNE RIVER AT MYTON, UTAH

LOCATION.—In NW. ¼ sec. 25, T. 3 S., R. 2 W., Uinta special base and meridian, at highway bridge at Myton, Duchesne County, 3 miles below mouth of Lake Fork and 15 miles above mouth of Uinta River.

DRAINAGE AREA.—2,750 square miles (measured on topographic map).

RECORDS AVAILABLE.—October 26, 1899, to November 30, 1910, and July 26, 1911, to September 30, 1922.

GAGE.—Chain gage on upstream rail near left end of steel highway bridge; installed August 6, 1910; read by Owen Smith and A. K. Draper.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Stream bed composed of coarse gravel; banks comparatively low but not likely to be overflowed, although they are subject to erosion during high water. Gravel riffle 200 feet below gage forms fairly permanent control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.94 feet at 8 a. m. June 10 (discharge, from extension of rating curve, 12,800 second-feet); minimum discharge, 282 second-feet October 12.

1899–1922: Maximum stage recorded, that of June 10, 1922; minimum stage recorded, 0.75 foot at 8.30 p. m. August 23 and 8 a. m. August 24, 1919 (discharge, 8 second-feet).

ICE.—Stage-discharge relation seriously affected by ice every winter.

DIVERSIONS.—Much of the low-water flow of the river and its tributaries is diverted for irrigation above station. In Strawberry Valley, 50,000 to 75,000 acre-feet is diverted to the Great Basin.

REGULATION.—Annual run-off is affected by storage in the United States Bureau of Reclamation reservoir on Strawberry River, one of the main tributaries.

ACCURACY.—Stage-discharge relation below 1,500 second-feet changed during high water in June and July; affected by ice January 8 to March 21. Rating curves well defined below 8,000 second-feet and extended above. Gage read to half-tenths from October 1 to February 20, and to hundredths from January 21 to September 30. Daily discharge ascertained by applying daily gage height to rating tables except for period of ice effect when discharge was estimated from observer's notes, recorded gage heights, weather records, and hydrographic comparison with other Duchesne River stations, and as noted in footnote to daily-discharge table. Records below 8,000 second-feet good; above that stage and estimated amounts fair.

COOPERATION.—One discharge measurement furnished by water commissioner, Uinta Basin.

Discharge measurements of Duchesne River at Myton, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 5	W. E. Dickinson	1.98	342	June 1	Dickinson, Jacob, and Preece [c]	6.67	6,470
10	do	2.04	378				
Jan. 19	do	[a] 2.50	380	12	Dickinson and Preece	6.80	7,560
May 5	C. C. Jacob [b]	3.83	1,970	Sept. 9	A. B. Purton	1.99	456

[a] Stage-discharge relation affected by ice.
[b] Water commissioner, Uinta Basin.
[c] Engineer, U. S. Bureau of Indian Affairs.

Daily discharge, in second-feet, of Duchesne River at Myton, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	304	410	410	540			548	1,240	6,860	2,410	621	840
2	329	410	441	540			606	1,320	6,690	2,260	1,150	738
3	354	410	472	472			663	1,460	7,000	2,110	771	728
4	354	344	441	472			562	1,590	7,180	1,680	698	717
5	295	329	441	472			788	1,960	7,350	1,700	634	738
6	354	329	441	410			806	2,730	7,830	1,510	603	691
7	354	329	441				663	3,270	8,060	1,580	578	603
8	354	329	441				606	3,730	8,240	1,300	524	528
9	365	329	456				548	4,260	8,680	1,070	512	454
10	376	329	472				570	3,270	8,770	960	530	452
11	304	320	472				623	2,620	8,180	896	536	449
12	282	312	472			625	562	2,160	7,150	896	416	416
13	304	304	472	390			441	2,260	7,280	834	473	460
14	304	329	472				520	2,300	7,280	771	530	472
15	329	354	472		425		540	2,350	6,270	771	495	384
16	354	329	506				452	2,520	5,850	722	460	379
17	354	304	540				365	2,910	5,640	672	466	400
18	304	304	540				460	3,730	6,280	603	466	422
19	304	304	540	380			388	4,640	6,910	659	477	379
20	329	354	540				506	4,700	6,800	744	628	369
21	354	354	655				466	4,760	6,890	634	778	379
22	372	410	655				600	4,830	6,840	696	640	353
23	392	329	695			1,050	703	5,230	6,230	758	1,060	374
24	410	329	472			1,040	806	5,740	5,210	704	672	400
25	578	354	540	370		924	865	6,160	4,170	698	659	395
26	410	486	615			766	1,130	6,580	3,940	628	628	328
27	410	441	615			608	1,200	7,040	3,430	566	698	389
28	410	329	615			631	1,230	6,880	3,140	628	634	353
29	410	382	596		-------	513	1,280	6,710	3,420	578	566	460
30	410	382	578		-------	555	1,260	6,640	3,120	578	578	369
31	410	-------	540		-------	615	-------	6,580	-------	578	717	-------

NOTE.—Stage-discharge relation affected by ice Jan. 7 to Mar. 22; braced figures show estimated mean discharge for periods indicated. No gage height record; discharge estimated Oct. 2, 9, 15, 22, 23, Nov. 11, 12, 16, Dec. 9, 18, 19, 25, 29, Mar. 26, Apr. 2, 8, 16, 23, 30, May 3, 21, 28, 30, June 4, 18, July 2, 13, 16, 22, 30, Aug. 13, 15, 20, Sept. 3, 8, 10, and 17.

Monthly discharge of Duchesne River at Myton, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	578	282	360	22,100
November	486	304	352	20,900
December	695	410	518	31,900
January	540	----------	400	24,600
February	----------	----------	425	23,600
March	----------	----------	660	40,600
April	1,280	365	692	41,200
May	7,040	1,240	3,940	242,000
June	8,770	3,120	6,360	378,000
July	2,410	566	1,010	62,100
August	1,150	416	619	38,100
September	840	328	481	28,600
The year	8,770	282	1,320	954,000

WEST FORK OF DUCHESNE RIVER NEAR HANNA, UTAH

LOCATION.—Near east line in SE. ¼ sec. 27, T. 1 N., R. 9 W., Uinta special base and meridian, a quarter of a mile above Wolf Creek, 3 miles above confluence with North Fork, and 6 miles northwest of Hanna, Duchesne County.

DRAINAGE AREA.—54 square miles.

RECORDS AVAILABLE.—August 16, 1921, to March 31, 1922.

GAGE.—Vertical enamel staff on left bank; read by J. T. Murdock.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Channel straight for 200 feet above and below gage. One channel at all stages. Bed of gravel and cobbles. Left bank high. Right bank may be overflowed during extremely high water. Cobble riffle control immediately below gage. Stage of zero flow at gage height −0.4 foot determined September 29, 1921.

EXTREMES OF DISCHARGE.—Maximum stage for year did not occur during period of records. Minimum stage recorded, 0.74 foot March 5–31 (discharge, 18 second-feet).

ICE.—Stream usually freezes over at times each winter.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent throughout period. Rating curve well defined. Gage read to hundredths once daily. Daily discharge determined by applying daily gage height to rating table. Records good.

Discharge measurements of West Fork of Duchesne River near Hanna, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 12	W. E. Dickinson	0.80	22.0
Sept. 14	A. B. Purton	.73	25.4

Daily discharge, in second-feet, of West Fork of Duchesne River near Hanna, Utah, for the period, October 1, 1921, to March 31, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	27	22	21	22	24	20	16	25	21	22	22	24	18
2	27	22	21	22	24	20	17	25	21	22	22	22	18
3	27	21	21	22	24	20	18	25	21	22	22	22	18
4	25	21	21	22	24	20	19	25	21	22	22	22	18
5	25	21	21	22	24	18	20	25	21	22	22	21	18
6	25	21	21	22	24	18	21	25	21	22	22	21	18
7	25	21	21	22	24	18	22	25	21	22	22	21	18
8	25	21	21	22	24	18	23	27	21	22	22	21	18
9	25	21	21	22	24	18	24	28	21	22	22	21	18
10	25	21	21	22	24	18	25	27	21	22	22	21	18
11	25	21	21	22	24	18	26	27	21	22	22	20	18
12	25	21	21	22	24	18	27	26	21	22	22	20	18
13	25	21	22	22	24	18	28	25	21	22	22	20	18
14	25	21	22	22	24	18	29	24	21	22	22	------	18
15	25	21	22	22	24	18	30	24	21	22	24	------	18
							31	23	----	22	24	------	18

Monthly discharge of West Fork of Duchesne River near Hanna, Utah, for the period October 1, 1921, to March 31, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	28	23	25.4	1,560
November	22	21	21.1	1,260
December	22	21	21.6	1,330
January	24	22	22.1	1,360
February	24	20	22.7	1,260
March	20	18	18.3	1,130
The period				7,900

WOLF CREEK NEAR HANNA, UTAH

LOCATION.—Near west line in SW. ¼ sec. 26, T. 1 N., R. 9 W., Uinta special base and meridian, 600 feet above mouth and 6 miles northwest of Hanna, Duchesne County.

DRAINAGE AREA.—19 square miles.

RECORDS AVAILABLE.—August 16, 1921, to March 31, 1922.

GAGE.—Vertical enamel staff on left bank; read by J. T. Murdock.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge 150 feet downstream.

CHANNEL AND CONTROL.—Channel winding. Bed composed of sand and cobbles. Banks heavily covered with willows which trail in water. Natural open place on left bank at gage and riffle. Trailing willows on right bank cut away at this place. One channel at all stages. Banks may be overflowed during possible sudden floods. Cobble riffle control 10 feet below gage. Stage of zero flow at gage height, 0.0 foot determined September 29, 1921.

EXTREMES OF DISCHARGE.—Extremes of year do not occur during period of record.

ICE.—Seldom forms at this station.

DIVERSIONS.—Small ditches divert water for use at Murdock ranch.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during period. Rating curve well defined. Gage read to hundredths once daily. Daily discharge determined by applying daily gage height to rating table; except for periods of ice effect, January 1–11 and January 29 to February 9, when discharge was estimated. Record good.

Discharge measurements of Wolf Creek near Hanna, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 12	W. E. Dickinson	0.92	8.7
Sept. 14	A. B. Purton	1.02	13.4

Daily discharge, in second-feet, of Wolf Creek near Hanna, Utah, for the period October 1, 1921, to March 31, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	13	11	10	9	8	8	16	12	10	10	9	8	8
2	13	11	10	9	8	8	17	11	10	10	9	8	8
3	12	11	10	9	8	8	18	11	10	10	9	8	8
4	13	11	10	9	8	8	19	11	10	10	8	8	8
5	13	11	10	9	8	8	20	11	10	10	8	8	8
6	13	11	10	9	8	8	21	11	10	10	8	8	8
7	12	10	10	9	8	8	22	11	10	10	8	8	8
8	12	10	10	9	8	8	23	11	10	10	8	8	8
9	12	10	10	9	8	8	24	12	10	10	8	8	8
10	12	11	10	9	8	8	25	11	10	10	8	8	8
11	12	10	10	9	8	8	26	11	10	9	8	8	8
12	12	10	10	9	8	8	27	11	10	9	8	8	8
13	12	10	10	9	8	8	28	11	10	9	8	8	8
14	12	10	10	9	8	8	29	11	10	9	8	------	8
15	12	10	10	9	8	8	30	11	10	9	8	------	9
							31	11	------	9	8	------	9

Monthly discharge of Wolf Creek near Hanna, Utah, for the period October 1, 1921, to March 31, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	13	11	11.7	719
November	11	10	10.2	607
December	10	9	9.8	603
January	9	8	8.6	529
February	8	8	8.0	444
March	9	8	8.1	498
The period	13	8	9.42	3,400

STRAWBERRY RIVER AT DUCHESNE, UTAH

LOCATION.—In SW. ¼ NE. ¼ sec. 2, T. 4 S., R. 5 W., Uinta special base and meridian, at Winslow ranch, three-fourths of a mile west of post office at Duchesne, Duchesne County, three-fourths of a mile above mouth of Indian Canyon Creek, a small tributary entering from south, and 1½ miles above confluence of Strawberry and Duchesne rivers.

DRAINAGE AREA.—1,040 square miles (measured on topographic maps).

RECORDS AVAILABLE.—June 10, 1908, to November 30, 1910; March 16, 1914, to September 30, 1922.

GAGE.—Vertical staff on downstream side of right abutment of bridge washed out June 5, 1922; replaced by enamel vertical staff June 13, 1922, lowering datum 2.70 feet; read by E. S. Winslow.

DISCHARGE MEASUREMENTS.—Made from cable just below bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for several hundred feet above and below gage. Bed of sand and fine gravel. Natural channel about 50 feet wide is constricted at bridge to 36 feet. Banks comparatively low, covered with underbrush; left bank subject to overflow at very high stages. Gravel riffle 200 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.70 feet on May 27 (discharge, 3,230 second-feet); minimum discharge estimated, 50 second-feet on January 7.

1908–1922: Maximum discharge, that of May 27; minimum discharge, 30 second-feet, November 20, 1914. Records obtained prior to 1914 incomplete.

ICE.—Stage-discharge relation affected by ice every winter.

DIVERSIONS.—50,000 to 75,000 acre-feet of water from Strawberry Valley reservoir (capacity, 250,000 acre-feet) about 40 miles above station, is diverted annually by means of a tunnel to Spanish Fork drainage basin. Some water is also diverted from upper end of Strawberry Valley to basin of Provo River.

REGULATION.—Since 1912 flow of river has been affected by operation of Strawberry Valley reservoir.

ACCURACY.—Stage-discharge relation changed slightly about June 12; affected by ice January 4 to March 23. Rating curves well defined below 500 second-feet; extended above. Gage read to hundredths twice daily, except June 6–12 when the gage-height was estimated. Daily discharge ascertained by applying mean daily gage height to rating tables except for period when stage-discharge relation was affected by ice. For this period, discharge estimated from temperature records, observer's notes, three meter measurements, and hydrographic comparison with other Duchesne River stations. Records good.

Discharge measurements of Strawberry River at Duchesne, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 2	W. E. Dickinson	2.37	129	June 13	W. E. Dickinson	[b] 8.15	1470
Jan. 16	do	[a] 3.06	93.4	21	do	7.09	876
17	do	[a] 2.94	80.2	Sept. 9	A. B. Purton	4.88	158
25	do	[a] 3.28	77.5				

[a] Stage-discharge relation affected by ice.
[b] Datum lowered 2.70 feet.

Daily discharge, in second-feet, of Strawberry River at Duchesne, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	124	133	120	135			160	498	2,420	583	450	303
2	127	131	120	135			176	585	2,440	572	730	216
3	127	129	116	126			192	626	2,260	538	527	184
4	127	131	118	120			225	738	1,940	468	298	184
5	127	127	120	110			256	1,000	1,780	414	256	184
6	129	124	116	85		130	223	1,360	1,670	375	227	180
7	131	124	114	50			169	1,640	1,600	360	223	174
8	129	124	105	60	90		180	1,870	1,600	354	209	165
9	131	120	100				171	1,940	1,530	331	205	162
10	127	120	100				171	1,660	1,460	331	205	156
11	129	116	120	80			169	1,270	1,460	309	205	156
12	127	116	133				165	1,090	1,330	298	205	156
13	129	116	139				156	1,050	1,370	290	184	156
14	131	116	137				150	1,150	1,400	276	194	156
15	129	116	139				154	1,210	1,340	271	194	156
16	129	116	135	93			146	1,260	1,260	251	184	156
17	133	116	80	80		250	139	1,500	1,200	251	180	156
18	131	116	78				141	1,810	1,120	251	169	151
19	133	118	107				154	2,120	1,040	239	317	148
20	131	122	137				158	2,340	970	256	271	148
21	127	124	145	68			174	2,280	905	276	246	148
22	127	126	171		110		207	2,300	840	256	256	148
23	131	127	174				289	2,360	800	281	527	148
24	135	124	133			335	299	2,420	758	251	256	148
25	197	120	137	77		268	325	2,480	718	246	223	148
26	137	116	133			234	352	2,760	690	232	188	148
27	137	116	137			226	380	3,230	610	227	184	148
28	133	116	139	85		188	423	2,820	590	331	184	156
29	135	114	137		-------	148	453	2,740	610	246	194	281
30	135	120	135		-------	146	460	2,710	598	223	205	162
31	133	-------	135		-------	152	-------	2,560	-------	227	209	-------

Monthly discharge of Strawberry River at Duchesne, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	197	124	133	8,180
November	133	114	121	7,200
December	174	78	126	7,750
January	135	50	84.4	5,190
February			99.3	5,510
March			202	12,400
April	460	139	227	13,500
May	3,230	498	1,790	110,000
June	2,440	590	1,280	76,200
July	583	223	317	19,500
August	730	169	261	16,000
September	303	148	169	10,100
The year	3,230	50	402	292,000

RED CREEK NEAR FRUITLAND, UTAH

LOCATION.—In SE. ¼ sec. 21, T. 3 S., R. 8 W., Uinta special base and meridian, 400 feet above State highway crossing at Murdock ranch, 1½ miles above confluence with Currant Creek, and 4 miles southeast of Fruitland, Duchesne County.

DRAINAGE AREA.—89 square miles.

RECORDS AVAILABLE.—November 23, 1917, to September 30, 1922, when station was discontinued.

GAGE.—Vertical enamel staff on left bank 200 feet east of ranch house and 400 feet upstream from road bridge; read by members of Murdock family.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—One channel at all stages. Banks subject to overflow at extremely high water. Left bank overgrown with willows. Right bank sloping meadow. Stream bed composed of silt and sand.

EXTREMES OF DISCHARGE.—Maximum discharge during year occurred in sudden flood on August 22; quantity not determined. Minimum stage, 3.53 feet on March 3 (discharge, 1 second-foot).

1918–1922: Sudden floods of high discharge occur nearly every summer; quantity not determined. Creek practically dry a part of each summer.

ICE.—Stream freezes over every winter.

DIVERSIONS.—Below all diversions from Red Creek.

REGULATION.—None except by diversion.

ACCURACY.—Stage-discharge relation changed May 17–26 and again on August 22; affected by ice December 1 to February 11. Rating curve well defined. Gage read to half-tenths, occasionally to hundredths, once a day except as stated in footnote to daily-discharge table. Shifting-control method used May 17 to September 30. Daily discharge ascertained by applying daily gage height to rating table. Discharge August 22, when water was over gage, and other periods of missing gage heights interpolated or estimated from elevation of high-water mark and observer's notes. Records fair.

Discharge measurements of Red Creek near Fruitland, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 12	W. E. Dickinson	4.05	14.1	June 22	W. E. Dickinson	4.22	30.1
Jan. 14	do	[a] 4.39	8.2	Sept. 8	A. B. Purton	3.96	14.6

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Red Creek near Fruitland, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	10				2	9	24	118	25	33	38
2	14	10				1	10	19	112	22	43	24
3	14	10				1	9	22	112	20	33	19
4	14	10				4	9	22	112	22	24	19
5	14	10				3	11	70	113	20	24	17
6	14	10			6	2	13	112	117	18	6	16
7	14	11				2	19	114	123	18	7	15
8	14	11				2	22	118	106	20	22	15
9	14	12				2	13	75	88	32	7	15
10	14	13				2	12	64	76	32	24	15
11	14	13				2	9	50	71	12	19	16
12	14	13			5	2	7	48	62	12	7	13
13	14	13			5	2	7	37	53	12	6	15
14	14	13			5	2	7	33	54	10	7	16
15	14	13			5	2	7	35	56	10	15	14
16	14	13	11	8	5	3	7	48	52	10	19	15
17	14	14			5	4	64	126	48	10	6	14
18	14	14			5	5	70	153	48	8	7	14
19	14	14			6	6	71	125	47	8	24	13
20	14	14			7	6	76	118	45	10	19	14
21	14	14			9	7	64	118	43	14	19	24
22	14	14			9	40	33	129	36	15	200	24
23	14	14			7	42	28	120		12	24	15
24	14	14			5	28	19	161		7	17	24
25	14	14			3	24	20	177		7	15	14
26	14	14			2	20	24	193	30	7	16	24
27	14	14			2	16	24	179		7	19	15
28	14	14			2	12	22	131		19	48	14
29	14	14			-------	7	26	131		15	43	33
30	13	14			-------	8	28	127		13	53	15
31	10	-------			-------	9	-------	123	-------	11	43	-------

NOTE.—No gage heights Nov. 27 to Dec. 3, Dec. 23, 24, Jan. 11–13, Mar. 26–28, June 14, 23–30, and Aug. 22. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Red Creek near Fruitland, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14	10	13.8	848
November	----------	10	12.7	756
December	----------	----------	11.0	676
January	----------	----------	8.0	492
February	----------	2	5.5	305
March	42	1	8.6	529
April	76	7	24.7	1,470
May	193	19	96.8	5,950
June	123	----------	64.4	3,830
July	32	7	14.8	910
August	----------	6	27.4	1,680
September	38	13	18.0	1,070
The year	----------	----------	25.6	18,500

WEST FORK OF LAKE FORK NEAR MOUNTAIN HOME, UTAH

LOCATION.—In SE. ¼ sec. 18, T. 2 N., R. 5 W., Uinta special base and meridian, a quarter of a mile below Moon Lake and 13 miles northwest of Mountain Home, Duchesne County.

DRAINAGE AREA.—108 square miles (measured on topographic map).

RECORDS AVAILABLE.—September 18, 1921, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder on right bank; attended by engineers of Office of Indian Affairs and United States Geological Survey.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Channel steep and rough. Bed composed of boulders and gravel. Right bank high; left bank low. One channel at all stages. Rock riffle control 25 feet below gage; practically permanent. Point of zero flow, gage height −1.1 feet, determined October 11, 1921.

EXTREMES OF DISCHARGE.—Maximum stage during year, 3.47 feet at 1 p. m. June 21 (discharge, 1,910 second-feet); minimum stage not recorded.

DIVERSIONS.—None above station.

REGULATION.—Flow affected by storage and release of water from Brown Duck Lake reservoir.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Water-stage recorder operated satisfactorily, except July 2–9. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph except for July 2–9 when discharge was estimated. Records good.

Discharge measurements of West Fork of Lake Fork near Mountain Home, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 11	W. E. Dickinson	0.49	60.1	July 10	C. J. Preece	1.38	279
June 10	Dickinson and Preece [a]	3.25	1,670	Sept. 12	Purton and Jacob [b]	.67	78.6

[a] Engineer, Office of Indian Affairs. [b] Water commissioner, Uinta Basin.

Daily discharge, in second-feet, of West Fork of Lake Fork near Mountain Home, Utah, for the period September 18, 1921, to September 30, 1922

Day	Sept.	Oct.	Nov.	May	June	July	Aug.	Sept.
1		61	59		1,090	660	209	138
2		61	58		1,190		229	134
3		61	56		1,310		222	127
4		61	56		1,550		206	131
5		61	56		1,690		190	141
						450		
6		62	55		1,800		170	134
7		64	55		1,620		166	120
8		64	53		1,330		163	111
9		64	51		1,620		159	101
10		62	51		1,680	275	170	96
11		60	51		1,520	254	156	92
12		61	49		1,420	232	138	87
13		61	48		1,470	222	141	84
14		61	49		1,440	212	151	80
15		61	49		1,140	236	141	79
16		60			1,110	260	129	77
17		59			1,230	268	120	76
18	96	59			1,430	268	116	74
19	96	57			1,540	268	113	73
20	94	57			1,600	275	120	73
21	90	57			1,670	271	127	70
22	88	56			1,570	264	151	69
23	85	56			1,350	282	154	68
24	80	65			1,100	268	141	66
25	76	66			960	246	127	65

Daily discharge, in second-feet, of West Fork of Lake Fork near Mountain Home, Utah, for the period September 18, 1921, to September 30, 1922—Continued

Day	Sept.	Oct.	Nov.	May	June	July	Aug.	Sept.
26	73	61	------	------	880	229	116	66
27	69	61	------	------	816	222	113	68
28	68	59	------	------	765	229	109	73
29	64	58	------	880	880	215	129	76
30	61	58	------	952	730	203	131	73
31	------	59	------	1,010	------	200	134	------

NOTE.—Braced figures show mean discharge for period indicated.

Monthly discharge of West Fork of Lake Fork near Mountain Home, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	66	56	60.4	3,710
November 1–15	59	48	53.1	1,580
June	1,800	730	1,310	78,000
July	660	200	312	19,200
August	229	109	150	9,220
September	141	65	90.7	5,400

LAKE FORK NEAR MYTON, UTAH

LOCATION.—In sec. 21, T. 3 S., R. 2 W., Uinta special base and meridian, 100 yards below highway bridge, half a mile above confluence of Lake Fork with Duchesne River, and 3½ miles northwest of Myton, Duchesne County.

DRAINAGE AREA.—468 square miles (measured on topographic maps).

RECORDS AVAILABLE.—July 3, 1900, to December 31, 1903; June 13, 1907, to November 30, 1910; July 26, 1911, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder on right bank; inspected by O. K. Draper.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Channel fairly straight for several hundred feet above and below gage. Banks high and not subject to overflow. Bed composed of silt and gravel. Gravel riffle about 300 feet below gage; fairly permanent. Point of zero flow, gage height 0.2 foot; determined July 29, 1922.

EXTREMES OF DISCHARGE.—Maximum discharge, 3,110 second-feet at 9 a. m. June 21 (gage height, 7.56 feet); minimum stage, 0.85 foot, 1 to 4 p. m. October 19 (discharge, 8 second-feet).

1900–1903; 1907–1922: Maximum stage recorded, 9.4 feet, June 22 and 23, 1917 (discharge, 4,350 second-feet); minimum discharge July 24, 1916, probably zero.

ICE.—Stage-discharge relation seriously affected by ice every winter.

DIVERSIONS.—No diversions below station; several canals of the Office of Indian Affairs and some privately-owned canals divert water above for irrigation. Some return water from irrigation enters a short distance above station.

REGULATION.—Flow affected by irrigation diversions above.

ACCURACY.—Stage-discharge relation changed slightly at numerous times; probably affected by ice December 6 to March 22. Rating curves well defined. Water-stage recorder operated satisfactorily except as stated in footnote to daily-discharge table. Daily discharge ascertained by applying mean daily gage height to rating tables. Shifting-control method used August 13–20.

Discharge for periods of missing gage height and ice effect, estimated from observer's notes, temperature records, one measurement, and by comparison with records for all Duchesne River stations. Records good except those for winter, which are fair.

Discharge measurements of Lake Fork near Myton, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 4	Dickinson and Charles[b]	1.26	23.4	June 21	Dickinson and Preece	7.54	3,100
Jan. 18	Dickinson and Draper[b]	[a] 2.86	128	27	Jacob and Preece	4.31	1,030
May 5	Jacob[c] and Draper	2.68	243	July 29	do	1.28	34.9
June 2	Dickinson and Draper	4.96	1,280	Sept. 9	Purton and Jacob	1.40	37.3
12	Dickinson and Preece[b]	6.51	2,240				

[a] Stage-discharge relation affected by ice.
[b] Engineer, Office of Indian Affairs.
[c] Water commissioner, Uinta Basin.

Daily discharge, in second-feet, of Lake Fork near Myton, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	22	54				155	142	1,170	600	37	98
2	20	22	57				149	149	1,230	500	43	65
3	18	18	66				149	170	1,440	395	43	60
4	19	17	53				148	185	1,640	350	35	68
5	16	15	60				177	226	2,040	334	27	87
6	19	12					151	271	2,320	303	30	91
7	27	18					122	285	2,520	271	28	65
8	26	21					121	342	2,850	205	19	57
9	27	21		125			126	378	2,880	150	15	37
10	23	18					102	342	2,820	100	14	32
11	21	19					122	280	2,500	50	21	33
12	22	19				140	106	285	2,120	25	24	30
13	18	20					103	271	2,290	26	24	26
14	17	24					106	236	2,180	41	22	22
15	16	28			130		118	202	1,600	42	18	20
16	17	32					104	181	1,340	38	17	14
17	16	33					103	224	1,440	36	18	14
18	11	36		128			91	271	1,890	22	17	18
19	9	45	95				93	342	2,370	26	26	19
20	13	114					98	338	2,420	39	37	15
21	14	104					114	326	2,600	40	38	16
22	14	92					122	329	2,600	25	43	16
23	14	86					132	398	2,160	32	87	15
24	16	81					137	476	1,530	44	82	13
25	24	90		100		162	146	594	1,290	44	51	13
26	24	90				166	158	765	1,140	36	35	16
27	22	79				173	170	800	948	30	40	20
28	25	60				155	160	790	840	29	43	20
29	29	56			-------	139	160	915	870	34	62	24
30	25	49			-------	139	144	1,020	700	28	66	20
31	21	-------			-------	149	-------	1,080	-------	29	78	-------

NOTE.—No gage heights Dec. 9, 11–16, 18–23, 25–30, Jan. 1–17, 19–31, Feb. 1 to Mar. 24, June 30 to July 2, and July 9–11. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Lake Fork near Myton, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	29	9	19.5	1,200
November	114	12	44.7	2,660
December	----------	54	89.0	5,470
January	----------	----------	115	7,070
February	----------	----------	130	7,220
March	----------	----------	143	8,790
April	177	91	130	7,740
May	1,080	142	407	25,000
June	2,880	700	1,858	111,000
July	600	22	127	7,810
August	87	14	36.8	2,260
September	98	13	34.8	2,070
The year	2,880	9	259	188,000

UINTA RIVER NEAR NEOLA, UTAH

LOCATION.—In SE. ¼ sec. 26, T. 2 N., R. 2 W., Uinta special base and meridian, 800 feet above tailrace of Uinta Power & Light Co.'s plant (Pole Creek unit), 1½ miles above mouth of Pole Creek, and 9 miles north of Neola, Duchesne County.

DRAINAGE AREA.—181 square miles.

RECORDS AVAILABLE.—July 30 to December 31, 1921; April 1 to June 7; and September 11 to 30, 1922.

GAGE.—Stevens continuous water-stage recorder on left bank removed June 20, 1922. Vertical staff installed to new datum on September 11, 1922; inspected by Jed Timothy and J. J. Johnson.

DISCHARGE MEASUREMENTS.—Made by wading or from cable. Cable destroyed by high water in June. Measuring conditions exceptionally bad at cable on account of rough channel.

CHANNEL AND CONTROL.—Channel steep and rough. Bed composed of boulders and gravel. Banks fairly high and probably not subject to overflow unless channel changes, which may readily occur during high water. Gage height of zero flow, 0.25 foot determined August 2, 1921.

EXTREMES OF DISCHARGE.—Not determined.

ICE.—River freezes over every winter.

DIVERSIONS.—None above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water; affected by ice December 17–27. Rating curves fairly well defined for low water, poorly defined for high water. Water-stage recorder operated satisfactorily October 1 to December 16 and April 4 to June 7. Staff gage read to hundredths once daily December 29–31 and September 11–30 except as stated in footnote to daily-discharge table. Daily discharge ascertained by applying to rating tables mean daily gage height as determined from recorder graph or staff gage readings. Discharge for ice-affected period estimated from observer's notes and temperature charts. Discharge for other periods of missing gage height interpolated. Records fair, except for discharges over 600 second-feet which may be poor.

Discharge measurements of Uinta River near Neola, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 3	W. E. Dickinson	1.71	152	Aug. 29	Jacob [b] and Preece [c]	5.05	385
Jan. 21	do	[a] 1.92	63.8	Sept. 11	A. B. Purton	1.26	202
June 7	do	3.70	1,960				

[a] Stage-discharge relation affected by ice.
[b] Water commissioner, Uinta Basin.
[c] Engineer, Office of Indian Affairs.

Daily discharge, in second-feet, of Uinta River near Neola, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Apr.	May	June	Sept.
1	154		107		147	960	
2	151	126	111	90	154	990	
3	151	126	107		172	1,130	
4	151	122	120	90	194	1,220	
5	149	122	141	101	236	1,450	
6	156	120	149	92	283	2,000	
7	158	120	138	90	331	2,380	
8	151	117	165	92	354		
9	149	117	251	89	290		
10	147	117	257	90	234		
11	145	117	209	86	209		201
12	143	115	145	86	194		198
13	143	117	109	88	189		196
14	141	113	109	88	189		185
15	141	113	107	86	191		185
16	138	113	106	88	201		182
17	138	109		88	251		180
18	138	109		89	339		180
19	136	113		88	404		175
20	136	115		89	368		170
21	134	113		98	339		166
22	134	111		106	377		161
23	134	113	100	115	435		161
24	156	109		117	513		161
25	145	111		122	609		161
26	134	109		128	706		166
27	136	107		124	750		168
28	128	107		126	840		171
29	134	107	103	132	990		171
30	128	106	106	138	1,000		171
31	128		99		1,000		

NOTE.—No gage height record Dec. 27, 28, Jan. 1 to Mar. 31, Apr. 1–3, June 8 to Sept. 10, Sept. 12, 16, 20, and 27. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Uinta River near Neola, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	158	128	142	8,730
November	128	106	115	6,840
December	257	99	124	7,620
April	138	86	99.9	5,940
May	1,000	147	403	24,800
June 1–7	2,380	960	1,450	20,000
September 11–30	201	161	175	7,000

WHITEROCKS CREEK NEAR WHITEROCKS, UTAH

LOCATION.—In sec. 18, T. 2 N., R. 1 E., Uinta special base and meridian, 8 miles north of Whiterocks, Uinta County. United States Whiterocks Canal diverts from left side and Farm Creek Canal from right side 2 miles below station.

DRAINAGE AREA.—118 square miles.

RECORDS AVAILABLE.—August 1, 1921, to November 18, 1921, and May 1 to September 30, 1922, at present site. November 8, 1917, to June 2, 1921, at a point about 2 miles downstream, below diversion of United States Whiterocks Canal and above Farm Creek Canal. 1889 to 1904 and 1907 to 1910 somewhere near present site. Records are comparable.

GAGE.—Stevens continuous water-stage recorder on left bank; installed August 4, 1921; inspected by J. F. Wilkin.

DISCHARGE MEASUREMENTS.—Made by wading or from cable a quarter of a mile above gage.

CHANNEL AND CONTROL.—Narrow canyon. Stream bed is steep and rough; composed of boulders and gravel. Channel is subject to change during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, 5.40 feet at 9 p. m. June 20 and 7 p. m. June 21 (discharge, 2,750 second-feet); minimum stage not determined.

1918–1922: Maximum stage that of June 20 and 21; minimum discharge not determined.

ICE.—Stream freezes over each winter.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed for low water, during extreme stage on June 21 and again on September 10 when rocks were removed from control. Rating curves well defined between 50 and 200 second-feet, fairly well defined between 200 and 2,000 second-feet. Operation of water-stage recorder satisfactory except as stated in footnote to daily-discharge table. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph. Shifting-control method used August 30 to September 9. Daily discharge interpolated October 7 and 8. For periods of missing gage-height, discharge estimated by comparison with Uinta River near Neola and Ashley Creek near Vernal. Records fair.

Discharge measurements of Whiterocks Creek near Whiterocks, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 9	W. E. Dickinson	1.00	85.2	June 19	W. E. Dickinson	4.31	1,690
Jan. 20	do	[a].68	33.7	Aug. 28	C. J. Preece [b]	2.01	206
June 6	do	4.07	1,470	Sept. 10	A. B. Purton	1.81	116

[a] Stage-discharge relation affected by ice.

[b] Engineer, Office of Indian Affairs.

Daily discharge, in second-feet, of Whiterocks Creek near Whiterocks, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	89	73		1,100	530	270	195
2	88	70	150	1,160	485	280	177
3	88	72		1,230	460	270	167
4	102	69		1,350	455	230	164
5	99	69	175	1,540	435	210	174
6	92	68	315	1,610	440	200	158
7	90	65	410	1,860	405	191	143
8	87	61	305	2,200	380	184	128
9	85	62	240	2,200	360	177	122
10	82	62	345	2,130	335	180	116
11	80	62	450	1,680	305	191	116
12	80	59	480	1,520	295	188	116
13	80	62	450	1,300	280	177	113
14	78	57	470	1,020	275	177	113
15	77	59			270	191	110
16	77	60		1,000	270	174	108
17	77	51			265	164	108
18	75	40		1,770	255	158	105
19	73	--------		2,100	240	155	105
20	72	--------	650	2,000	235	155	102
21	71	--------		2,200	235	180	100
22	70	--------		1,410	230	152	100
23	71	--------		1,260	250	167	100
24	85	--------		1,100	225	184	100
25	88	--------			225	200	98
26	81	--------		800	230	200	98
27	81	--------	810		240	205	100
28	70	--------	900		230	215	100
29	78	--------	1,020		235	230	100
30	72	--------	1,060	580	250	220	100
31	75	--------	1,030	--------	250	210	--------

NOTE.—No gage-heights Oct. 7, 8, May 1–4, 15–26, June 15–17, and 25–29. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Whiterocks Creek near Whiterocks, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	102	70	81.1	4,990
November 1–18	73	40	62.3	2,230
May	1,060	----------	544	33,400
June	2,200	580	1,380	82,100
July	530	225	309	19,000
August	280	152	196	12,100
September	195	98	121	7,200

PRICE RIVER NEAR HELPER, UTAH

LOCATION.—In SE. ¼ sec. 36, T. 13 S., R. 9 E., at highway bridge, three-fourths of a mile above diversion dam of Price River Irrigation Co., 2 miles south of Helper, Carbon County, and 3 miles below Spring Creek.

DRAINAGE AREA.—530 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 21, 1904, to September 30, 1922.

GAGE.—Vertical staff on left bank, installed July 16, 1907. May 29, 1922, station moved downstream a quarter of a mile to highway bridge and chain gage installed at new datum; read by D. S. Rowley.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of gravel and sand. A riffle immediately below ford shifts occasionally during floods. Control at new site is a riffle of gravel and cobbles.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.50 feet at 7 a. m. May 20 (discharge, 3,100 second-feet); minimum discharge probably about 35 second-feet in February when stage-discharge relation was affected by ice.

1904–1922: Summer floods occur nearly every year and may exceed any recorded stage. Maximum stage recorded for which discharge was determined, 8.43 feet at 9 p. m. June 25, 1917, determined by leveling from hub set at high-water mark (discharge determined from extension of rating curve, 8,500 second-feet). Minimum discharge, 4 second-feet during December, 1905, and January, 1906.

ICE.—Stage-discharge relation affected by ice for short periods nearly every winter.

DIVERSIONS.—Practically none.

REGULATION.—Practically none.

ACCURACY.—Stage-discharge relation changed slightly for low water during winter; affected by ice November 16–23, December 6–16, 24–25, and January 1 to March 10. Rating curves fairly well defined. Gages read to hundredths once a day with occasional omissions and twice daily during periods of rapidly changing stage. Daily discharge ascertained by applying daily gage height to rating tables. Discharge for period of ice-effect estimated from three meter measurements, temperature records, and observer's notes. Discharge interpolated or estimated from observer's notes for days when no gage heights were obtained and for days of small floods. Records fair.

Discharge measurements of Price River near Helper, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 6	R. R. Rowe	[a] 0.89	41.5	Mar. 16	W. E. Dickinson	0.70	55.4
6	do	[a] .76	40.2	May 25	do	3.85	2,250
Jan. 27	W. E. Dickinson	[a] .89	40.6	Aug. 29	A. B. Purton	7.20	56.4

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Price River near Helper, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	54	63				83	730	1,940	254	134	175
2	57	54	57				99	778	1,890	224	150	150
3	57	52	37				131	778	1,780	195	145	69
4	57	51	45				169	1,140	1,700	175	114	85
5	54	54	37			38	239	1,300	1,540	156	98	100
6	60	51	40				187	1,490	1,490	150	81	64
7	62	51					164	1,570	1,380	150	78	59
8	63	54					141	1,660	1,320	134	66	54
9	57	48					117	1,450	1,190	118	100	49
10	57	51					112	1,170	1,110	128	80	49
11	56	48	40			39	108	908	978	118	74	46
12	54	48				39	91	908	942	109	70	39
13	54	48				70	91	1,120	834	100	66	39
14	54	54				47	91	980	748	96	69	39
15	51	47			38	65	91	1,090	620	85	59	37
16	54			40		65	87	1,170	572	83	54	37
17	54		37			82	83	2,000	540	81	58	37
18	54		40			62	87	2,070	484	78	61	37
19	54		45			55	87	2,250	432	78	125	37
20	51	45	60			65	104	3,100	373	78	105	37
21	51		96			76	165	1,940	350	78	100	37
22	48		84			99	225	1,900	309	80	78	37
23	51		48			122	275	2,010	290	81	156	37
24	73	51	45			158	298	2,290	263	81	81	37
25	73	51	45			124	360	2,310	246	78	71	37
26	63	45	48			112	421	2,310	223	74	61	37
27	60	45	54			108	660	2,130	201	74	58	42
28	57	48	48			97	578	1,970	195	700	56	42
29	57	51	48		-------	99	688	2,120	212	150	125	42
30	57	48	48		-------	82	762	2,080	272	92	150	44
31	57	-------	51		-------	80	-------	2,000	-------	100	225	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. No gage-height record Oct. 7, Dec. 16, Jan. 16, 18, 20, 22, 24, 30, Feb. 28, Apr. 7, 21, 25, July 2, Aug. 12, 17, 25, and Sept. 13; discharge estimated.

Monthly discharge of Price River near Helper, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	86	48	57.0	3,500
November	54	-------	48.8	2,900
December	-------	-------	47.6	2,930
January	-------	-------	40.0	2,460
February	-------	-------	38.0	2,110
March	158	-------	68.6	4,220
April	762	83	226	13,400
May	3,100	730	1,640	101,000
June	1,940	195	814	48,400
July	254	74	135	8,300
August	225	54	95.1	5,850
September	115	37	45.4	3,240
The year	3,100	-------	272	198,000

HUNTINGTON CREEK NEAR HUNTINGTON, UTAH

LOCATION.—In SE. ¼ sec. 6, T. 17 S., R. 8 E., at Cunha ranch 7 miles northwest of Huntington, Emery County. Below all main tributaries except Fish Creek.

DRAINAGE AREA.—188 square miles (measured on United States Forest Service map, 1920).

RECORDS AVAILABLE.—May 3, 1909, to September 30, 1922, fragmentary.

GAGE.—Stevens continuous water stage recorder on right bank installed September 11, 1917; inspected by Joseph Cunha.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge at gage.

CHANNEL AND CONTROL.—Bed composed of gravel and sand. Control of coarse gravel shifts occasionally during high stages.

EXTREMES OF DISCHARGE.—Maximum stage for year, 5.29 feet at 11 p. m. May 25 (discharge, 1,340 second-feet); minimum stage not determined.

1909–1922: Maximum discharge, 1,340 second-feet at 9.30 p. m. May 25, 1920, and at 11 p. m. May 25, 1922; minimum discharge, 12 second-feet March 20–23, 1912.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Several small ditches divert from tributaries above station.

REGULATION.—Small storage reservoir above station regulates flow to a slight extent.

ACCURACY.—Stage-discharge relation slightly changed for low water during May; affected by ice November 17 to March 30. Rating curves well defined. Outside staff gage was read about once a week to hundredths, during periods when operation of the recorder was unsatisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph or weekly readings. Daily discharge good; estimated periods fair.

Discharge measurements of Huntington Creek near Huntington, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Dec. 7	R. R. Rowe	[a] 2.22	39.7
Jan. 27	W. E. Dickinson	[a] 2.65	44.8
May 26	do	4.67	924

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Huntington Creek near Huntington, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	58					50	188	918	234		116
2	70	58					53	196	874	210		56
3	72	58					56	216	852	193	170	
4	74	56					60	222	858	181		
5	74	56					60	282	858	174		56
6	70	58					82	381	858	170	142	
7	70	58					100	442	841	163		57
8	64	53						438	802	193		56
9	64	54					80	348	759	198		54
10	62	54						295	697	193		53
11	62	53	40	45	45	45	58	250	619	188		53
12	62	59					54	250	578	184		52
13	62	60					50	260	587	179	125	50
14	62	59						280	540	177		50
15	62	59						300	500	174		49
16	60	58					50		470	172		49
17	59	44						380	485	170		48
18	59								484	168		48
19	59	45					58		394	168		48
20	59						64	462		168		48

Daily discharge, in second-feet, of Huntington Creek near Huntington, Utah, for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	59					45	72	553		163		47
22	58					50	82	667		161		49
23	60					60	87	771	394	157	125	49
24	74					82	91	892		152		42
25	58				45		100	1,010	304	148		43
26		45	40	45			106	1,040	273	146	84	42
27						65	114	929	256	152	94	50
28	58						130	958	250		53	57
29							141	994	285	156	76	35
30							168	1,000	285		62	30
31						50		976		159	62	

NOTE.—No gage-height record Oct. 26–31, Nov. 1, 18–21, 23–27, 29, 30, Dec. 1–6, 8–12, 14–18, 20–28, 30, 31, Jan. 1, 2, 4–9, 11–18, 20–25, 27–31, Feb. 1, 2, 4–8, 10–17, 19–24, 26–28, Mar. 1, 3–6, 8–13, 15, 17–23, 25–30, Apr. 8–10, 14–18, May 11–19, June 14–17, 19–24, July 28–30, Aug. 1–5, 7–12, 14–25, Sept. 3–6, 29, and 30; discharge estimated. Braced figures show estimated mean discharge for periods indicated, based on hydrographic comparison with Cottonwood Creek near Orangeville.

Monthly discharge of Huntington Creek near Huntington, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	74		62.8	3,860
November	60		51.3	3,050
December			40	2,460
January			45	2,770
February			45	2,500
March			50.9	3,130
April	168		77.5	4,610
May	1,040	188	520	32,000
June	918	250	553	32,900
July	234	146	173	10,600
August			123	7,560
September	116	30	51.8	3,080
The year	1,040	30	150	109,000

COTTONWOOD CREEK NEAR ORANGEVILLE, UTAH

LOCATION.—In SW. ¼ sec. 10, T. 18 S., R. 7 E., at Johnson ranch, 5 miles northwest of Orangeville, Emery County.

DRAINAGE AREA.—200 square miles (measured on United States Forest Service map, 1920).

RECORDS AVAILABLE.—May 1, 1909, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder installed August 11, 1921, on left bank near ranch house; inspected by George Sitterud.

DISCHARGE MEASUREMENTS.—Made from cable 500 feet downstream or by wading.

CHANNEL AND CONTROL.—Bed rough; shifting. Banks fairly high but have been overflowed by sudden floods, to which the stream is subject. Control composed of gravel and sand.

EXTREMES OF DISCHARGE.—Maximum stage during year, 9.1 feet about 10 p. m. August 22 (discharge by extending curve, 2,500 second-feet); minimum discharge probably less than 20 second-feet in winter.

1909–1922: Maximum discharge, that of August 22; minimum discharge recorded, 5 second-feet, September 21, 1910.

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Two or three small ditches divert water above station but all main ditches take out below.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water on August 22; affected by ice November 18 to March 6. Rating curves fairly well defined below 800 second-feet and extended above. Water-stage recorder operated successfully except as indicated in footnote to daily-discharge table. Daily discharge ascertained by applying mean daily gage height to rating table. Discharge for ice-affected periods estimated from observer's notes, weather records, and two discharge measurements. Discharge for other periods of missing gage heights interpolated or estimated by comparison with flow of Ferron Creek. Records fair.

Discharge measurements of Cottonwood Creek near Orangeville, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 7	R. R. Rowe	[a] 3.13	20.8	May 27	W. E. Dickinson	5.70	820
Jan. 27	W. E. Dickinson	[a] 4.28	28.8	Aug. 30	A. B. Purton	2.62	47.3

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Cottonwood Creek near Orangeville, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	52					47	195	990	474	326	141
2	60	52					59	186	920	440	317	69
3	59	51					64	198	965	408	233	55
4	58	51					65	223	1,030	388	214	49
5	58	52					58	276	1,100	379	202	45
6	59	52					46	276	1,080	367	198	43
7	78	52				50	50	292	1,080	355	188	40
8	59	50					58	316	1,000	343	184	38
9	58	49					50	340	985	317	182	37
10	58	50					57	340	920	300	182	36
11	58	49					56	270	880	281	173	36
12	58	50					55	200	840	268	167	35
13	58	50				47	56	210	860	256	176	32
14	57	50					54	225	808	246	182	32
15	55	51	35	30	35		47	246	708	238	167	31
16	55	54					41	274	688	231	165	29
17	55	46				50		346	716	226	186	28
18	55							400	712	223	180	30
19	55							455	704	228	233	30
20	56						72	510	692	228	289	30
21	57	40				56		490	680	219	246	30
22	57							470	640	216	490	30
23	60								604	214	100	29
24	71					60			574	202	62	29
25	50	39					104	665	550	198	53	30
26	45	39					123		518	193	51	30
27	49					58	125	860	494	204	51	30
28	45	38				46	165	900	506	211	47	32
29	52				-------	45	200	940	574	200	62	30
30	54				-------	42	209	1,090	556	243	62	29
31	52	-------			-------	42	-------	990	-------	223	110	-------

NOTE.—Only weekly readings obtained during period of ice-effect. Monthly discharge for December, January, and February estimated. No gage heights March 1–5, 7–12, 14–20, 22–26, Apr. 17–24, May 1, 8–14, 18, 19, 23–26, Sept. 8 and 9. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Cottonwood Creek near Orangeville, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	78	45	56.9	3,500
November	54	----------	45.7	2,720
December	----------	----------	35	2,150
January	----------	----------	30	1,840
February	----------	----------	35	1,940
March	----------	42	51.2	3,150
April	209	----------	78.8	4,690
May	1,090	186	457	28,100
June	1,100	494	779	46,400
July	474	193	275	16,900
August	490	47	177	10,900
September	141	28	38.8	2,310
The year	1,100	----------	172	125,000

FERRON CREEK (UPPER STATION) NEAR FERRON, UTAH

LOCATION.—Close to line between sec. 1 and 2, T. 20 S., R. 6 E., a quarter of a mile below house at Peterson ranch, 1½ miles above grist mill, and 5 miles northwest of Ferron, Emery County.

DRAINAGE AREA.—140 square miles (measured on United States Forest Service map, 1920).

RECORDS AVAILABLE.—May 6, 1911, to September 30, 1922.

GAGE.—Inclined staff on right bank; installed September 23, 1911; read by Joseph Peterson. Datum lowered 1.00 foot September 4, 1919.

DISCHARGE MEASUREMENTS.—Made by wading or from cable 15 feet upstream from gage.

CHANNEL AND CONTROL.—Banks high and not subject to overflow. Bed composed of sand and gravel. Current swift and has tendency to cut channel deeper. Stage of zero flow at gage height −0.5 foot determined August 12, 1921.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.00 feet at 8 p. m. August 22 (discharge, 1,110 second-feet); minimum stage not determined.

1911–1922: Maximum stage recorded, 10.0 feet at 3 p. m. July 25, 1920 (discharge, probably 2,000 second-feet); minimum discharge, 1 second-foot March 22 and 23, 1912.

ICE.—Stage-discharge relation seriously affected by ice.

DIVERSIONS.—Above all diversions except a small ditch for the Peterson ranch.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed for low water, during high water in May or June; affected by ice November 15–27 and December 6 to March 23. Rating curves fairly well defined below 400 second-feet and extended above. Gage read to hundredths once or twice daily except as stated in footnote to daily-discharge table. Daily discharge ascertained by applying mean daily gage height to rating table except for days of large fluctuation and periods when stage-discharge relation was affected by ice. For the latter periods discharge was estimated from two measurements, observer's notes, recorded gage heights, and weather records. Discharge interpolated for days when gage was not read. Records fair.

Discharge measurements of Ferron Creek (upper station) near Ferron, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 6	R. R. Rowe	[a] 0.56	17.5	May 27	W. E. Dickinson	3.28	401
Jan. 28	W. E. Dickinson	[a] 1.38	7.8	Aug. 30	A. B. Purton	.45	32.2

[a] Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of Ferron Creek (upper station) near Ferron, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	26	29				27	110	543	121	55	40
2	27	24	27				24	131	545	105	47	55
3	27	23	25				23	245	654	99	50	35
4	27	25	25				25	260	679	84	42	35
5	30	29	21				22	380	692	84	42	32
6	84	23	18				20	374	646	80	41	31
7	30	22					20	410	655	75	40	30
8	25	22					21	297	630	72	40	31
9	25	18					24	152	555	68	40	29
10	25	19					20	95	574	63	40	30
11	25	20					23	100	501	62	39	29
12	27	21				25	22	118	417	56	38	28
13	27	20					21	138	338	56	60	28
14	28	18	15				20	200	321	56	39	29
15	29			10	20		20	194	311	50	36	28
16	29						22	243	342	54	34	28
17	28						19	270	342	50	38	28
18	28						22	254	332	49	34	27
19	29						23	352	291	48	50	27
20	29						23	291	281	48	40	28
21	29	18					38	272	258	47	50	28
22	29						55	417	212	47	70	28
23	28						50	496	218	44	37	27
24	28					32	63	604	196	43	36	27
25	29					36	86	641	171	44	36	27
26	21		20			25	95	531	157	42	33	27
27	27					24	95	517	144	41	32	27
28	28	25		8		25	105	614	140	65	32	27
29	29	27		8		29	110	572	131	41	33	26
30	28	29		8		21	130	641	171	41	32	26
31	27			8		27		580		55	55	

NOTE.—No gage heights and discharge estimated Oct. 1, 3, 5, 7, 9, 14, 24, 30, Nov. 1, 2, 7, 10, 13, 16, 17, 24, 26, Dec. 2, 14, 16, 18, 20–25, 28–30, Jan. 1, 3, 10, 18, Feb. 15, 21, Mar. 10, 13, 21, Sept. 17, 19, 21, and 24. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Ferron Creek (upper station) near Ferron, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	84	21	29.3	1,800
November	29		20.8	1,240
December	29		18.6	1,140
January			9.7	596
February			20	1,110
March			25.6	1,570
April	130	19	42.3	2,520
May	641	95	339	20,800
June	692	131	382	22,700
July	121	41	61.0	3,750
August	70	32	41.6	2,560
September	55	26	29.9	1,780
The year	692		85.1	61,600

LITTLE COLORADO RIVER BASIN

ZUNI RIVER AT BLACKROCK, N. MEX.

LOCATION.—At reservoir on Zuni Indian Reservation at Blackrock, McKinley County. Rio de Los Nutrias, nearest large tributary, enters from north about 4 miles above.

DRAINAGE AREA.—About 660 square miles.

RECORDS AVAILABLE.—Yearly flow July 1, 1903, to June 30, 1905; July 1, 1908, to June 30, 1910. Monthly flow October 1, 1910, to September 30, 1922. Record since July 1, 1908, shows inflow into reservoir.

METHOD OF COLLECTING DATA.—From July 1, 1903, to June 30, 1905, records were obtained by the ordinary stream-gaging methods. Reservoir completed in 1908. Record beginning July 1, 1908, obtained by means of gage in reservoir and capacity curve for reservoir, quantity of water released from the reservoir during the periods of inflow being taken into consideration.

EXTREMES OF DISCHARGE.—Channel dry greater part of the year below point where it leaves mountains, but stream is subject to sudden floods of considerable volume and usually of short duration.

DIVERSIONS.—Reservoir at Ramah, about 18 miles above station, capacity of which is given as 4,240 acre-feet, is used to irrigate about 1,150 acres in T. 11 N., R. 16 W. There are other small ponds or reservoirs in drainage area.

COOPERATION.—Record furnished by the Office of Indian Affairs, through H. F. Robinson, supervising engineer, Albuquerque, N. Mex.

Monthly discharge of Zuni River at Blackrock, N. Mex., for the year ending September 30, 1922

Month	Run-off in acre-feet	Month	Run-off in acre-feet	Month	Run-off in acre-feet
October	0	March	6	August	1,110
November	0	April	186	September	286
December	0	May	189		
January	0	June	0	The year	2,320
February	339	July	210		

VIRGIN RIVER BASIN

VIRGIN RIVER AT VIRGIN, UTAH.

LOCATION.—In NW. ¼ sec. 27, or NE. ¼ sec. 28, T. 41 S., R. 12 W., a few hundred feet above point where river enters a steep, narrow gorge and three-quarters of a mile west of Virgin, Washington County. Station replaces one maintained prior to February, 1915, half a mile above Virgin and gives practically the same record of flow.

DRAINAGE AREA.—1,010 square miles (measured on topographic map).

RECORDS AVAILABLE.—April 18, 1909, to September 30, 1922.

GAGE.—Chain gage on right bank near lower end of sandstone bluff; installed February 1, 1915; read by Lawrence Earl.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge 7 miles below gage.

CHANNEL AND CONTROL.—Bed consists of sand and gravel. Right bank high; left bank low and is overflowed. One channel at all stages. Principal control is a gravel bar a short distance below gage; shifting.

EXTREMES OF DISCHARGE.—Not determined for current year.

1909–1918: Maximum stage recorded, 11.6 feet at upper station October 27, 1912 (discharge estimated, 12,000 second-feet). Flood of August 31, 1909, probably equaled or exceeded this flow. Minimum discharge, 24 second-feet, July 1, 2, 4, and 5, 1909.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Above all important diversions.

REGULATION.—None.

ACCURACY.—Stage-discharge relation variable. Gage read to hundredths four or five times a week. Occasional floods of short duration occurred which do not appear in recorded gage heights. Rating curves not sufficiently well defined to warrant publication of daily discharge. Monthly discharge is believed to be accurate enough for general studies.

Discharge measurements of Virgin River at Virgin, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 4	W. E. Dickinson	2.76	127
May 27	A. B. Purton	3.85	1,190

Monthly discharge of Virgin River at Virgin, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet, mean	Run-off in acre-feet	Month	Discharge in second-feet, mean	Run-off in acre-feet
October	225	13,800	March	435	26,700
November	214	12,700	April	638	38,000
December	526	32,300	May	1,380	84,800
January	331	20,400	June	455	27,100
February	345	19,200			

NOTE.—Records for July, August, and September are not given because of uncertainty of results.

SANTA CLARA CREEK NEAR CENTRAL, UTAH

LOCATION.—In sec. 11, T. 39 S., R. 16 W., just above bridge at R. H. Hunt ranch, 1 mile southeast of Central, Washington County, on road to Pine Valley. Hunt's spring, which has fairly constant discharge of about 3 second-feet, enters 40 feet below gage.

DRAINAGE AREA.—84 square miles (measured on topographic maps).

RECORDS AVAILABLE.—April 21, 1909, to September 30, 1922.

GAGE.—Vertical enamel staff nailed to cottonwood tree on left bank about 50 feet above bridge; read by Mrs. R. H. Hunt. Datum of gage was raised 0.45 foot on January 20, 1910, 2.00 feet on February 22, 1916, and lowered 1.00 foot on August 12, 1918.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge at gage.

CHANNEL AND CONTROL.—Stream bed consists of gravel and sand. Banks fairly high but may be overflowed at extreme stage; one channel at all stages. A riffle formed by small boulders 40 feet below gage is fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.5 feet at 12.30 p. m. on December 21 (discharge by extending rating, 900 second-feet); Minimum discharge, 6 second-feet January 19–20.

1909–1922: Maximum stage recorded 5.00 feet at 11 a. m. October 6, 1916 (discharge, 1,450 second-feet); minimum stage, 0.82 foot January 8, 1920 (discharge, 4 second-feet).

ICE.—Stage-discharge relation seldom affected by ice.

DIVERSIONS.—The New Castle Reclamation Co. have a reservoir on Grass Valley Creek that has a capacity of 23,000 acre-feet. Water is diverted into this reservoir from Santa Clara Creek above town of Pine Valley and released into tunnel through rim of the Great Basin for irrigation of lands outside the Colorado River basin. Central Canal diverts water about 2 miles above station for irrigation of lands near Central. This canal has been measured when it was carrying 16 second-feet.

REGULATION.—Flow affected by the diversions and storage above.

ACCURACY.—Stage-discharge relation for low water changed December 21. Rating curves fairly well defined below 200 second-feet and extended above. Gage read to hundredths once daily with frequent omissions of one to two days. Daily discharge ascertained by applying daily gage height to rating table, or by interpolating discharge for days when gage was not read. Records fair, except for very high water, which may be poor.

Discharge measurements of Santa Clara Creek near Central, Utah, during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 5	W. E. Dickinson	1.08	14.3
May 26	A. B. Purton	2.37	201

Daily discharge, in second-feet, of Santa Clara Creek near Central, Utah, for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	14	11	152	12	16	26	97	154	60	32	25
2	12	14	11	285	12	18	26	97	162	55	28	26
3	12	14	11	156	12	13	26	104	157	50	25	25
4	12	14	12	28	13	12	42	112	162	45	24	26
5	12	14	11	20	13	10	36	129	167	45	23	26
6	12	14	11	10	13	8	30	140	157	43	23	26
7	12	14	12	22	12	12	30	152	157	40	23	25
8	12	14	11	21	14	13	32	162	148	38	23	24
9	12	13	11	19	182	10	30	112	138	38	26	23
10	12	13	11	16	112	9	46	101	125	36	26	20
11	12	12	11	14	30	10	32	90	116	34	26	20
12	12	12	10	14	18	10	30	80	104	32	26	20
13	12	12	10	14	15	13	28	87	93	30	26	19
14	12	12	10	15	13	14	28	90	87	27	25	19
15	12	12	9	14	13	35	25	93	93	26	25	19
16	12	12	9	14	13	63	22	112	93	26	25	20
17	12	12	9	14	26	38	20	133	93	26	25	19
18	12	12	11	10	19	13	23	157	97	25	25	19
19	12	12	12	6	16	33	25	167	92	26	26	19
20	12	12	14	6	14	53	24	162	87	30	26	18
21	13	12	400	12	14	66	23	157	87	28	26	18
22	13	12	133	12	13	25	43	157	87	28	26	18
23	22	12	70	12	11	133	55	177	83	28	26	18
24	32	12	44	12	11	53	60	182	83	27	26	18
25	19	11	38	12	11	45	66	228	77	25	26	18
26	18	11	26	13	12	45	71	204	76	23	26	18
27	17	11	20	13	13	43	77	167	74	23	25	18
28	16	11	28	13	14	36	80	162	71	23	25	18
29	16	11	20	13	-------	30	93	160	66	26	25	18
30	15	11	19	13	-------	28	93	157	63	24	25	18
31	15	-------	20	13	-------	28	-------	145	-------	23	25	-------

Monthly discharge of Santa Clara Creek near Central, Utah, for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	32	12	14.1	867
November	14	11	12.4	738
December	400	9	33.4	2,050
January	285	6	31.9	1,960
February	182	11	24.0	1,330
March	133	8	30.2	1,860
April	93	20	41.4	2,460
May	228	80	138	8,480
June	167	63	108	6,430
July	60	23	32.6	2,000
August	32	23	25.5	1,570
September	26	18	20.6	1,230
The year	400	6	42.8	31,000

GILA RIVER BASIN

GILA RIVER NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In NE. ¼ sec. 31, T. 6 S., R. 28 E., 1 mile below intake of Brown Canal and 10 miles east of Solomonsville, Graham County. San Francisco River enters from right 10 miles upstream.

DRAINAGE AREA.—7,910 square miles (measured on topographic maps).

RECORDS AVAILABLE.—April 21, 1914, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder on left bank, directly opposite J. W. Earven ranch; inspected by J. W. Earven.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel, sand, and silt. Banks well defined. Control formed by gravel riffle below gage.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.6 feet at 2 a. m. August 15 (discharge, 3,780 second-feet); minimum stage, 1.0 foot June 17–19 (discharge, 42 second-feet).

1914–1922: Maximum stage determined from floodmarks on gage, 14.0 feet January 19, 1916 (discharge, about 100,000 second-feet from extension of rating curve); minimum discharge that of June 17–19, 1922.

DIVERSIONS.—Station is above diversions for irrigation in Safford Valley, except Brown Canal which diverts 1 mile above station for irrigating 820 acres. Brown Canal wasteway returns some water to river below this station. About 14,000 acres are irrigated from Gila River and tributaries above Safford Valley.

ACCURACY.—Stage-discharge relation fairly permanent between rises. Twenty-eight measurements made during year define rating curves as follows: October 1 to December 23, well defined above 140 second-feet; December 24 to January 16, fairly well defined; January 17 to February 14 shifting-control method used; February 15 to April 3, well defined; April 4 to July 8, well defined; July 9 to August 15, fairly well defined; August 16 to September 30, well defined below 150 second-feet. Water-stage recorder checked on days when measurements were made, and at other times by J. W. Earven. Operation of recorder satisfactory throughout year except for period June 1–6. Staff gage readings used June 1 and 6. Discharge interpolated June 2–5. Daily discharge ascertained by applying mean daily gage height to rating tables. Records good.

Discharge measurements of Gila River near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	H. D. Empie	1.54	282	May 2	H. D. Empie	1.32	130
14	do	1.24	154	11	do	1.28	103
Nov. 2	do	1.26	165	20	do	1.18	78
15	do	1.28	178	June 1	do	1.14	66
Dec. 1	do	1.36	207	6	do	1.05	51
15	do	1.37	206	19	do	1.02	43
Jan. 1	do	1.40	203	July 1	do	1.21	95
16	do	1.43	225	15	do	1.11	79
Feb. 1	do	1.40	188	22	Gardiner and Empie	1.13	90
15	do	1.41	184	Aug. 1	H. D. Empie	1.28	127
Mar. 1	do	1.40	181	10	do	1.42	174
15	do	1.43	189	15	do	2.98	2,480
Apr. 12	do	1.52	206	Sept. 2	do	1.25	108
19	do	1.38	151	13	do	1.26	114

Daily discharge, in second-feet, of Gila River near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	265	162	200	205	188	175	175	114	71	83	335	90
2	242	162	200	205	182	175	175	114	67	83	458	107
3	242	162	200	260	182	175	260	134	63	71	302	124
4	220	162	200	375	182	175	325	114	58	71	168	107
5	220	162	200	315	182	175	291	114	54	59	149	107
6	200	162	220	288	160	175	291	114	50	59	130	163
7	200	162	242	288	160	175	291	114	50	98	115	163
8	180	162	242	288	160	175	257	114	50	257	115	124
9	180	162	220	288	155	154	257	114	50	240	335	210
10	180	162	220	288	155	154	228	98	50	149	168	335
11	162	162	220	288	155	154	228	98	50	149	149	186
12	162	162	220	288	155	175	200	98	50	115	130	124
13	162	162	220	288	178	175	200	98	50	90	662	107
14	162	162	200	260	178	175	176	98	50	90	554	107
15	145	180	200	232	175	175	176	83	50	90	1,720	90
16	145	180	220	205	175	175	176	83	50	79	605	90
17	145	180	200	225	175	154	153	83	42	100	554	90
18	145	180	200	200	154	154	153	71	42	79	780	107
19	145	162	200	200	154	175	153	71	42	79	1,140	107
20	145	162	200	200	154	175	134	71	50	79	910	210
21	128	180	200	200	154	175	134	83	50	100	662	163
22	145	180	200	200	154	154	134	83	50	79	503	268
23	145	180	200	200	154	154	134	83	50	70	413	268
24	145	180	205	200	154	154	134	71	50	79	302	186
25	162	180	205	170	154	175	134	71	59	213	210	163
26	180	180	205	170	154	202	134	71	59	115	186	124
27	180	180	205	170	154	202	134	71	83	100	163	124
28	180	180	205	170	154	175	134	71	98	100	144	107
29	180	180	205	192	-------	175	134	71	98	90	163	107
30	162	180	205	192	-------	175	114	59	153	90	107	90
31	162	-------	205	190	-------	175	-------	71	-------	90	90	-------

Monthly discharge of Gila River near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	265	128	175	10,800
November	180	162	170	10,100
December	242	200	209	12,900
January	375	170	234	14,400
February	188	154	164	9,110
March	202	154	171	10,500
April	325	114	187	11,100
May	134	59	90.4	5,560
June	153	42	59.6	3,550
July	257	70	105	6,460
August	1,720	90	401	24,700
September	335	90	145	8,630
The year	1,720	42	176	128,000

GILA RIVER NEAR ASHURST, ARIZ.

LOCATION.—In sec. 30, T. 5 S., R. 24 E., below all canal headings in Safford Valley and 1½ miles east of Ashurst, Graham County.

DRAINAGE AREA.—10,900 square miles (measured on topographic maps).

RECORDS AVAILABLE.—December 24, 1920, to September 30, 1922. Discharge measurements only.

DISCHARGE MEASUREMENTS.—Made by wading near road crossing.

DIVERSIONS.—About 38,000 acres are irrigated by Gila River and tributaries above this station. Water for about 24,000 acres diverted by Safford Valley canals.

REGULATION.—Flow varies considerably with amount of water diverted by canals of Safford Valley.

ACCURACY.—No gage heights are obtained at this station; discharge measurements only are made. Records give outflow from Safford Valley, below all diversions.

Discharge measurements of Gila River at Ashurst, Ariz., during the period December 24, 1920, to September 30, 1922

[Made by H. D. Empie]

Date	Discharge	Date	Discharge	Date	Discharge
1920	*Sec.-ft.*	1921	*Sec.-ft.*	1922	*Sec.-ft.*
Dec. 24	91	July 2	1.5	Mar. 2	3.4
		Sept. 15	23	Apr. 15	4.1
1921		Oct. 30	16.4	May 3	3.8
Jan. 17	102	Nov. 3	3.8	June 2	2.4
Feb. 19	8.7	Dec. 3	105	July 3	1.7
Mar. 1	6.2			Aug. 2	254
Apr. 2	5.2	1922		Sept. 4	3.5
May 3	4.2	Jan. 4	146		
June 3	2.7	Feb. 2	62		

GILA RIVER NEAR SAN CARLOS, ARIZ.

LOCATION.—In T. 3 S., R. 18 E., unsurveyed, 1 mile above San Carlos dam site, on San Carlos Indian Reservation, and 6 miles west of San Carlos, Gila County. San Carlos River enters from right 8 miles upstream.

DRAINAGE AREA.—12,900 square miles (measured on topographic maps).

RECORDS AVAILABLE.—April 29, 1914, to September 30, 1922, at present site. July 11, 1899, to November 27, 1905, at point half a mile south of San Carlos, and below San Carlos River. August 17, 1910, to February 5, 1911, at point just below Arizona Eastern Railroad bridge, and half a mile above San Carlos River.

GAGE.—Stevens continuous water-stage recorder on left bank; inspected by Tecora Ketchayan and Harvey Ford.

DISCHARGE MEASUREMENTS.—Made from cable a mile above gage, from crossing cable at gage, or by wading.

CHANNEL AND CONTROL.—Bed composed of sand, gravel, and boulders. Banks not subject to overflow. Boulder riffle just below gage. At low stages gravel bar is formed on left bank around point of rock at gage location, necessitating the maintenance of a ditch from channel to gage well. This low-water condition develops a changeable control, and frequent inspection of well and ditch, and frequent measurements are required to determine stage-discharge relation.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.1 feet on August 21 (discharge, 1,150 second-feet); minimum discharge, 0.6 second-foot July 12.

1914–1922: Maximum stage, 25.5 feet, January 20, 1916 (discharge, from extension of rating curve, about 92,000 second-feet); minimum stage, dry June 28 to July 1, 1919.

DIVERSIONS.—About 38,000 acres are irrigated from Gila River and tributaries above this station.

ACCURACY.—Stage-discharge relation changed on account of changes in ditch to gage during low water, and changes in gravel bar about gage at other stages. Standard rating curve fairly well defined between 1,000 and 14,000 second-feet; poorly defined above. Below 1,000 second-feet, several rating curves covering different periods of time, dependent upon changes in ditch and control, and discharge measurements, have been used. Water-stage recorder checked weekly or semiweekly. Operation of water-stage recorder was reasonably satisfactory except when influenced by poor channel conditions at low water as indicated in footnote to daily-discharge table. Daily discharge ascertained by applying mean daily gage height to rating table except as indicated in footnote to table of daily discharge. Shifting-control method used January 19–28. Records fair.

Discharge measurements of Gila River near San Carlos, Ariz., during the year ending September 30, 1922

[Made by J. H. Gardiner]

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 6	1.21	55	Feb. 24	1.43	79	May 6	1.19	25
25	1.20	52	25	1.50	66	July 12	1.00	0.40
Nov. 17	1.20	54	Mar. 29	1.30	55	28	(a)	62
22	1.28	68	Apr. 2	1.34	53	Aug. 21	4.10	1,150
Jan. 7	2.33	450	15	1.23	40	Sept. 7	1.59	20
8	2.22	356	May 1	1.17	26	16	.95	9.3

a No water at gage. Heavy bar cuts off channel.

Daily discharge, in second-feet, of Gila River near San Carlos, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	55	71	112	119	58	53	30	5	5	387	
2	55	55	77	127	119	58	53	21	5	5	240	
3	55	55	77	607	119	58	65	30	5	5	127	50
4	55	55	90	745	119	58	124	30	5	5	50	
5	55	55	90	467	119	59	116	30	5	4	16	12
6	55	55	119	467	119	53	85	30	5	4	25	16
7	55	55	119	408	119	53	65	30	5	4	38	20
8	55	55	119	389	112	53	65	25	5	3	38	16
9	55	55	119	370	112	59	59	25	5	3		16
10	55	55	119	354	112	53	47	20	5	3		10
11	55	55	125	324	104	53	59	20	5	2		8
12	55	55	130	309	90	65	53	15	5	2		20
13	55	55	135	294	90	65	47	15	5	3		8
14	55	55	130	294	84	65	47	15	5	0.6	350	12
15	55	55	130	294	84	65	47	10	5	1.4		16
16	55	55	125	324	84	65	47	10	5	30		11
17	55	55	119	324	84	72	47	10	5	60		
18	55	55	119	295	90	78	47	10	5	90		
19	46	55	119	253	84	78	47	5	5	100	730	
20	46	55	119	215	84	85	47	5	5	250	730	
21	46	60	115	215	84	72	47	5	5	150	1,150	11
22	46	65	110	204	84	53	41	5	5	100		
23	46	65	100	192	84	47	41	5	5	30		
24	55	65	90	192	80	47	41	5	5	60		
25	55	65	90	183	65	53	41	5	6	500		
26	55	65	100	152	58	65	41	5	6	300	100	18
27	55	65	153	119	58	59	41	5	5	100		18
28	55	65	104	105	58	53	41	5	5	62		18
29	55	65	104	104	-------	53	35	5	5	62		18
30	55	65	104	97	-------	53	30	5	5	62		18
31	55	-------	104	127	-------	53	-------	5	-------	424		-------

NOTE.—Braced figures show mean discharge for periods indicated for which no records are available, estimated by comparison with flow at other stations in basin. Staff readings used Oct. 1, 6, 8, 15, 18, 21; Dec. 6, 10, 13, 20, 24, 27; Feb. 25; Aug. 5, 8, 19, and Sept. 5; ditch to recorder well out of order. Discharges interpolated or estimated Oct. 2–5, 7, 12–14, 16, 17, 19–21, 23, 24; Dec. 4, 5, 7–9, 11, 12, 14–19, 21–23, 25, 26, 28–30; Feb. 17, 23, 24; July 16–30; Aug. 6, 7, and Sept. 28–30 by comparison with records for other stations in basin; record lost on these dates because ditch was out of order. Gage heights May 8–19 believed affected by ditch maintenance and discharges have been estimated.

Monthly discharge of Gila River near San Carlos, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	55	46	53.5	3,290
November	65	55	58.2	3,460
December	153	71	111	6,820
January	745	97	279	17,200
February	119	58	93.5	5,190
March	85	47	60.0	3,690
April	124	30	54.0	3,210
May	30	5	14.2	873
June	6	5	5.1	303
July	500	.6	78.4	4,820
August	1,150	16	259	15,900
September	----------	----------	18.5	1,100
The year	1,150	.6	91.0	65,900

GILA RIVER AT KELVIN, ARIZ.

LOCATION.—In sec. 12, T. 4 S., R. 13 E., 1,000 feet below mouth of Mineral Creek, 15 miles below mouth of San Pedro River, a quarter of a mile below concrete highway bridge, 25 miles above Florence, and 1 mile west of Kelvin, Pinal County.

DRAINAGE AREA.—18,100 square miles (measured on topographic maps and Greenidge map of Sonora).

RECORDS AVAILABLE.—January 26, 1911, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder on left bank.

DISCHARGE MEASUREMENTS.—Made from highway bridge a quarter of a mile above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of sand, gravel, and silt; continually shifting. Banks well defined. Gravel riffle 300 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.25 feet at 3.30 p. m. August 22 (discharge, 2,360 second-feet); minimum stage, 1.7 feet, June 9–27, and June 29 to July 3 (discharge, 4.5 second-feet).

1911–1922: Maximum stage recorded, 19.5 feet about noon, January 20, 1916, determined from floodmarks (discharge, from extension of rating curve, about 132,000 second-feet, revised); no flow on June 29 to July 11, 1913.

DIVERSIONS.—Station is above diversions for Florence-Casa Grande Valley. About 38,000 acres irrigated from Gila River above this station. Acreage irrigated from San Pedro River not known.

ACCURACY.—Stage-discharge relation continually changing. Standard rating curve fairly well defined below 30,000 second-feet; poorly defined above. Rating curves for short periods between rises used. Water-stage recorder checked weekly during year by observer. Operation of water-stage recorder satisfactory except for periods indicated in footnote to daily-discharge table. Daily discharge ascertained by applying mean daily gage height to rating tables except as indicated in footnote to table of daily discharge. Shifting-control method used October 25 to November 22 and January 10 to March 26. Records good.

Discharge measurements of Gila River at Kelvin, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 7	John H. Gardiner	2.17	91	May 7	John H. Gardiner	2.02	37
24	do	2.12	78	22	do	1.86	16
Nov. 16	do	2.17	70	July 11	do	2.10	46
23	do	2.28	117	29	do	2.58	267
Jan. 4	do	3.55	1,040	Aug. 11	do	3.47	995
9	do	2.76	360	18	do	3.25	709
Feb. 22	do	2.45	160	22	do	4.35	2,340
26	do	2.42	103	29	do	2.33	112
Mar. 27	do	2.39	112	Sept. 5	do	2.30	101
Apr. 3	do	2.50	172	17	do	1.94	21
12	Gardiner and Schwalen	2.29	91	30	do	1.94	17

Daily discharge, in second-feet, of Gila River at Kelvin, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	198	79	150	198	300	100	82	48	8	4.5	580	56
2	150	79	150	515	260	88	82	48	8	4.5	505	56
3	122	79	150	832	260	78	178	40	8	4.5	440	77
4	110	79	165	1,150	260	80	178	40	8	8	440	118
5	97	79	165	580	260	80	198	40	8	8	440	102
6	97	74	180	440	260	80	198	40	8	8	440	102
7	97	74	198	440	260	80	157	32	8	8	440	102
8	97	74	198	380	260	80	140	32	8	32	440	118
9	136	74	198	353	240	83	122	31	4.5	157	505	375
10	122	74	198	320	220	94	108	30	4.5	94	580	695
11	110	68	198	320	220	94	108	28	4.5	48	1,390	495
12	97	68	198	320	205	106	94	27	4.5	48	622	240
13	97	68	198	290	205	120	94	26	4.5	40	302	112
14	97	66	215	290	185	150	85	25	4.5	40	255	58
15	86	66	215	290	185	134	76	24	4.5	40	440	40

Daily discharge, in second-feet, of Gila River at Kelvin, Ariz., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	86	66	215	290	165	120	66	22	4.5	48	870	26
17	86	79	198	320	165	120	57	21	4.5	58	1,000	21
18	86	82	180	320	165	167	48	21	4.5	48	712	20
19	86	74	180	320	150	152	48	21	4.5	140	1,310	19
20	75	77	180	320	150	124	58	16	4.5	122	935	18
21	75	80	180	275	165	152	58	16	4.5	412	935	17
22	75	93	198	275	176	152	48	16	4.5	198	1,390	16
23	75	122	198	255	177	140	48	16	4.5	94	695	16
24	75	122	198	255	148	126	48	16	4.5	48	450	16
25	86	122	180	255	122	126	48	16	4.5	69	375	16
26	94	122	198	235	98	126	40	16	4.5	1,080	228	30
27	94	122	198	235	100	122	48	16	4.5	665	168	60
28	94	122	198	235	100	108	48	16	16	440	150	112
29	83	150	198	235	-------	94	48	11	4.5	278	118	66
30	83	165	198	235	-------	82	48	11	4.5	162	102	21
31	79	-------	198	375	-------	82	-------	11	-------	505	77	-------

NOTE.—Staff readings used Dec. 30, Jan. 4, 26, Feb. 12, July 24, Sept. 22, 30, due to clock stopping or mud in well. Discharge estimated or interpolated Dec. 27–29, Dec. 31 to Jan. 3, Apr. 14–17, May 8–16, Sept. 18–21, 23–27, 29, 31; from field observations and by comparison with records for other stations in basin.

Monthly discharge of Gila River at Kelvin, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	198	75	98.2	6,040
November	165	66	90.0	5,360
December	215	150	189	11,600
January	1,150	235	360	22,100
February	300	98	195	10,800
March	167	78	111	6,820
April	198	40	88.6	5,270
May	48	11	24.9	1,530
June	16	4.5	5.82	346
July	1,080	4.5	158	9,720
August	1,390	77	559	34,400
September	695	16	107	6,370
The year	1,390	4.5	166	120,000

SUNSET CANAL NEAR DUNCAN, ARIZ.

LOCATION.—In NW. ¼ sec. 17, T. 19 S., R. 20 W. New Mexico principal meridian, in New Mexico, 1½ miles below intake, 9 miles east of Arizona-New Mexico State line, and 14 miles east of Duncan, Greenlee County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; July 15, 1922, to September 30, 1922.

GAGE.—Vertical staff on right bank at Brook ranch; read by G. S. Hayes.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Bed composed of silt. Banks vertical. No well-defined control.

DIVERSIONS.—About 35 acres irrigated above station.

ACCURACY.—Stage-discharge relation continually changing. Standard rating curve well defined. Gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Shifting-control method used for entire year. Records good.

Canal diverts water from right side of Gila River in NW. ¼ sec. 20, T. 19 S. R. 20 W. New Mexico principal meridian, for irrigating 1,800 acres near Virden.

Discharge measurements of Sunset Canal near Duncan, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
July 15	Gardiner and Gilipin	1.76	31.5	Sept. 9	J. H. Gardiner	1.98	34.6
18	J. H. Gardiner	1.34	24.2	11	do	1.95	39.6

Daily discharge, in second-feet, of Sunset Canal near Duncan, Ariz., for the period July 15 to September 30, 1922

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1		24	8	11		28	32	21	37	15	38
2		5	9	12		28	5	22	21	18	43
3		12	24	13		43	5	23	14	15	47
4		27	18	14		47	5	24	13	22	47
5		33	15	15	29	32	2	25	23	32	44
6		31	24	16	30	13	0	26	35	32	42
7		29	29	17	23	11	15	27	18	28	39
8		28	32	18	23	12	33	28	13	27	39
9		18	27	19	18	21	38	29	10	22	39
10		37	38	20	12	23	40	30	10	17	36
								31	10	14	

Monthly discharge of Sunset Canal near Duncan, Ariz., for the period July 15 to September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 15-31	37	10	19.9	671
August	47	5	24.0	1,480
September	47	0	27.1	1,610
The period	47	0	24.3	3,760

COSPER-WINDHAM CANAL NEAR DUNCAN, ARIZ.

LOCATION.—In NW. ¼ sec. 11, T. 19 S., R. 21 W. New Mexico principal meridian, in New Mexico, half a mile below intake, 4 miles east of Arizona-New Mexico State line, and 9 miles east of Duncan, Greenlee County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; July 18, 1922, to September 30, 1922.

GAGE.—Vertical staff on left bank at Foster ranch; read by W. F. Foster.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Bed composed of silt. Banks vertical. No well-defined control.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation fairly permanent for period. Rating curve fairly well defined. Gage read twice a day to nearest hundredth. Daily discharge ascertained by applying mean daily gage height to rating table. Discharge interpolated for August 12. Records fair.

Canal diverts water from right side of Gila River in SW. ¼ sec. 11, T. 19 S., R. 21 W. New Mexico principal meridian, for irrigating 800 acres near Virden.

The following discharge measurement was made by J. H. Gardiner:
July 17, 1922: Gage height, 0.72 foot; discharge, 1.6 second-feet.

Daily discharge, in second-feet, of Cosper-Windham Canal near Duncan, Ariz., for the period July 18 to September 30, 1922

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1		14	2	11		2	8	21	10	4	10
2		9	3	12		5	6	22	6	4	10
3		10	8	13		7	8	23	2	4	7
4		11	2	14		0	8	24	1	4	8
5		10	2	15		0	8	25	11	2	7
6		3	3	16		0	8	26	10	2	8
7		2	6	17		0	8	27	1	1	10
8		4	1	18	2	0	7	28	1	3	9
9		6	0	19	2	0	7	29	1	2	8
10		14	0	20	2	5	11	30	1	3	7
								31	2	2	

Monthly discharge of Cosper-Windham Canal near Duncan, Ariz., for the period July 18 to Septembr 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 18–31	11	1	3.7	103
August	14	0	4.3	264
September	10	0	6.3	377
The period	14	0	5.0	744

MODDLE CANAL NEAR DUNCAN, ARIZ.

LOCATION.—In NW. ¼ sec. 10, T. 19 S., R. 21 W. New Mexico principal meridian, in New Mexico, half a mile below intake, 4 miles east of Arizona-New Mexico State line, and 9 miles east of Duncan, Greenlee County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; July 17, 1922, to September 30, 1922.

GAGE.—Vertical staff on left bank; read by W. W. Lloyd.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Bed composed of silt. Banks vertical. No well-defined control.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation continually changing. Standard rating curve fairly well defined. Gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Shifting-control method used for entire year. Records fair.

Canal diverts water from left side of Gila River in NW. ¼ sec. 11, T. 19 S., R. 21 W. New Mexico principal meridian, for irrigating 2,200 acres near Franklin.

Discharge measurements of Moddle Canal near Duncan, Ariz., during the year ending September 30, 1922

[Made by J. H. Gardiner]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
July 17	0.56	0.57
Sept. 9	1.12	5.8

Daily discharge, in second-feet, of Moddle Canal near Duncan, Ariz., for the period July 17 to September 30, 1922

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1		24	3.6	11		2.8	0	21	1.7	22	24
2		45	4.8	12		1.2	0	22	.4	49	24
3		39	6.4	13		28	0	23	.4	50	15
4		12	4.1	14		45	0	24	.4	41	13
5		7.6	3.5	15		5.4	13	25	4.7	25	7.2
6		3.0	9.0	16		5.4	33	26	3.4	19	18
7		2.4	7.0	17	0.5	47	33	27	.4	15	17
8		3.6	8.0	18	.5	47	16	28	.7	8.4	17
9		3.6	6.2	19	.9	43	51	29	.3	4.3	13
10		24	8.0	20	.5	7.8	30	30	.3	4.3	9.4
								31	.3	3.6	

Monthly discharge of Moddle Canal near Duncan, Ariz., for the period July 17 to September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 17–31	4.7	0.3	1.03	31
August	50	1.2	20.6	1,270
September	51	0	13.1	780
The period	51	0	13.8	2,080

BROWN CANAL NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In SE. ¼ SE. ¼ sec. 30, T. 6 S., R. 28 E., near Earven ranch, a quarter of a mile below intake, and 10 miles east of Solomonsville, Graham County.

RECORDS AVAILABLE.—June 1, 1914, to September 30, 1915; December 20, 1920 to September 30, 1922.

GAGE.—Vertical enamel staff on right bank 10 feet below head gate; read by J. W. Earven.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of silt. Banks not subject to overflow. Control affected by periodic deposits from wash on right bank just below gage.

DIVERSIONS.—No diversions above gage.

ACCURACY.—Stage-discharge relation not permanent. Rating curves fairly well defined. Gage read to nearest two-hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records fair.

Canal diverts water from right side of Gila River in SE. ¼ sec. 30, T. 6 S., R. 28 E., for irrigating about 820 acres east of Solomonsville.

Discharge measurements of Brown Canal near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	H. D. Empie	4.90	9.0	Apr. 19	J. H. Gardiner	5.07	13.6
Nov. 2	do	5.08	14.7	May 2	H. D. Empie	4.90	11.5
Dec. 1	do	5.15	14.4	June 1	do	4.80	9.9
Jan. 1	do	4.85	9.4	July 1	do	5.02	9.1
Feb. 1	do	5.10	13.5	15	do	5.26	15.2
Mar. 1	do	5.10	13.2	Aug. 1	do	4.98	9.5
Apr 12	do	5.10	15.9	Sept. 1	do	5.18	13.2

Daily discharge, in second-feet, of Brown Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9	14	14	9	14	14	13	12	10	9	16	12
2	8	14	14	9	14	14	13	12	10	9	11	12
3	9	14	13	9	14	14	16	12	10	9	10	14
4	11	14	13	9	14	14	17	12	10	9	10	14
5	11	14	10	9	14	14	18	12	10	9	10	14
6	12	14	8	9	14	14	18	12	10	11	10	14
7	11	14	8	9	14	14	18	12	10	13	10	14
8	11	14	8	9	14	14	18	12	10	14	10	15
9	12	14	10	9	14	14	17	12	10	13	11	15
10	11	14	12	9	14	14	17	12	10	15	12	10
11	13	14	12	9	14	10	17	11	10	18	12	8
12	13	16	12	9	14	0	16	10	10	18	12	8
13	13	16	12	9	14	0	13	10	10	16	18	8
14	14	15	12	9	14	0	14	10	10	16	18	8
15	14	13	12	9	14	0	14	10	10	11	8	8
16	14	16	13	9	14	3	15	10	10	10	3	8
17	14	15	13	9	14	14	15	10	10	10	0	8
18	14	15	13	9	14	14	14	10	10	12	0	8
19	13	15	13	9	14	14	14	10	10	10	0	8
20	12	15	13	9	14	14	14	10	10	11	0	10
21	12	15	13	9	14	14	14	10	10	12	0	10
22	12	15	13	9	14	14	14	10	10	12	0	10
23	12	15	13	12	14	14	12	10	10	10	2	10
24	12	15	13	14	14	14	12	10	10	13	8	10
25	14	15	13	14	14	14	12	10	10	14	7	10
26	14	14	13	14	14	14	12	10	10	12	8	10
27	14	13	13	14	14	14	12	10	12	12	9	8
28	14	13	11	14	13	13	12	10	3	12	9	7
29	14	15	9	14	-------	13	12	10	9	12	7	7
30	14	15	9	14	-------	13	12	10	10	12	6	7
31	14	-------	9	14	-------	13	-------	10	-------	13	8	-------

Monthly discharge of Brown Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14	8	12.4	762
November	16	13	14.5	863
December	14	8	11.7	719
January	14	9	10.4	640
February	14	13	14.0	778
March	14	0	11.6	713
April	18	12	14.5	863
May	12	10	10.7	658
June	12	3	9.8	583
July	18	9	12.2	750
August	18	0	7.9	486
September	15	7	10.2	607
The year	18	0	11.6	8,420

BROWN CANAL WASTEWAY NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In SE. ¼ NE. ¼ sec. 31, T. 6 S., R. 28 E., near Earven ranch and 10 miles east of Solomonsville, Graham County.

RECORDS AVAILABLE.—December 20, 1920, to September 30, 1922.

GAGE.—Vertical enamel staff on right bank 200 feet below waste gate; read by J. W. Earven.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of silt. Channel straight. Banks not subject to overflow.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curves fairly well defined. Gage read to nearest two-hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Shifting-control method used October 2 to November 1. Records fair.

Wasteway returns water from Brown Canal to Gila River half a mile below station, "Gila River near Solomonsville."

Discharge measurements of Brown Canal wasteway near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	H. D. Empie	5.20	6.0	Apr. 19	J. H. Gardiner	5.06	4.2
Nov. 2	do	5.36	7.6	May 2	H. D. Empie	5.00	3.2
Dec. 1	do	5.42	7.2	June 1	do	5.22	5.2
Jan. 1	do	4.99	3.5	July 1	do	5.10	3.9
Feb. 1	do	5.28	5.8	22	Gardiner and Empie	5.03	3.5
Mar. 1	do	5.40	8.0	Aug. 1	H. D. Empie	5.20	4.8
Apr. 12	do	4.98	3.5	Sept. 2	do	5.15	5.5

Daily discharge, in second-feet, of Brown Canal wasteway near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	8	8	1	6	7	5	3	6	4	4	4
2	6	8	8	0	6	6	5	3	6	4	6	4
3	7	7	8	0	6	6	6	3	6	4	6	4
4	7	7	8	0	6	6	8	3	6	4	6	3
5	6	5	7	3	6	6	4	3	6	4	6	3
6	6	5	6	3	6	6	4	3	6	4	6	3
7	5	4	6	3	6	6	4	3	6	6	6	2
8	6	5	6	3	6	6	4	3	6	5	6	2
9	6	5	8	3	6	6	4	3	6	4	6	2
10	5	6	10	3	6	6	4	3	6	1	6	6
11	5	6	10	3	6	5	4	4	6	0	5	4
12	6	7	10	3	6	0	3	4	6	0	5	4
13	6	7	10	3	6	0	3	4	6	0	7	4
14	7	6	10	3	6	0	4	4	6	0	8	4
15	7	5	10	3	6	0	5	4	6	4	8	4
16	7	6	10	3	6	1	4	4	6	4	2	4
17	7	6	10	3	6	4	3	4	6	4	0	4
18	7	7	10	4	6	4	3	4	6	5	0	4
19	4	7	10	4	6	4	3	4	6	3	0	4
20	4	7	10	3	6	4	3	5	6	3	0	3
21	4	8	10	3	6	4	3	5	6	3	0	3
22	5	8	10	4	6	4	3	5	6	3	0	3
23	6	8	10	5	6	4	3	5	6	3	0	3
24	7	8	10	6	6	4	3	5	6	3	0	2
25	7	8	10	6	6	5	3	5	6	5	0	2
26	6	8	10	7	6	5	3	5	6	3	0	2
27	6	8	10	6	6	5	3	5	8	3	0	2
28	5	8	10	6	6	5	3	5	1	3	0	2
29	5	8	3	6	-------	4	3	5	5	3	0	2
30	4	8	10	6	-------	5	3	5	8	3	0	2
31	4	-------	3	6	-------	5	-------	5	-------	3	1	-------

Monthly discharge of Brown Canal wasteway near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	7	4	5.8	357
November	8	4	6.8	405
December	10	3	8.8	541
January	7	0	3.6	221
February	6	6	6.0	333
March	7	0	4.3	264
April	8	3	3.8	226
May	5	3	4.1	252
June	8	1	6.6	393
July	6	0	3.2	197
August	8	0	3.0	184
September	6	2	3.2	190
The year	10	0	4.9	3,570

MICHELANA CANAL NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In NE. ¼ SW. ¼ sec. 3, T. 7 S., R. 27 E., at Moody ranch, a quarter of a mile below head gate and 6 miles northeast of Solomonsville, Graham County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; December 21, 1920, to September 30, 1922.

GAGE.—Vertical staff on right bank 30 feet below wagon bridge; read by Edwin Moody.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of silt. Banks vertical. No well-defined control.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation not permanent. Standard rating curve fairly well defined. Gage read twice a day to hundredths. Daily discharge ascertained by applying mean daily gage height to rating tables. Shifting-control method used for entire year. Records fair.

Canal diverts water from right side of Gila River in the SW. ¼ sec. 31, T. 7 S., R. 28 E., for irrigating about 450 acres near Solomonsville.

Discharge measurements of Michelana Canal near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	H. D. Empie	4.70	6.5	June 1	H. D. Empie	4.10	3.5
Nov. 2	do	4.60	6.0	5	do	4.13	4.3
Dec. 1	do	4.90	7.5	9	do	4.00	2.6
Jan. 2	do	4.78	6.4	21	do	3.85	1.5
Feb. 1	do	4.90	7.3	27	do	4.15	4.0
Mar. 1	do	4.30	8.0	July 1	do	4.14	4.1
Apr. 12	do	4.22	7.3	13	do	4.93	2.6
19	J. H. Gardiner	4.52	11.2	21	do	4.10	3.7
May 2	H. D. Empie	4.36	9.1	Aug. 1	do	4.43	7.1
19	do	4.00	6.6	Sept. 1	do	4.38	6.4
26	do	4.13	4.4	9	do	4.32	5.3

Daily discharge, in second-feet, of Michelana Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6	9	7	8	5	11	7	9	4	5	6	6
2	6	7	7	8	5	11	7	8	4	4	5	5
3	5	7	7	7	5	11	7	7	4	4	6	3
4	5	8	7	7	5	12	9	7	5	4	5	3
5	6	8	6	7	5	10	9	7	4	4	5	6
6	6	8	6	7	5	8	9	8	3	4	5	6
7	6	8	6	6	5	8	9	9	4	4	4	6
8	6	10	6	6	5	8	9	9	4	5	5	6
9	6	9	6	6	5	8	8	9	3	4	7	6
10	6	10	6	6	2	8	8	9	3	4	8	3
11	6	10	6	6	0	8	8	9	2	4	6	3
12	6	8	6	6	0	8	7	9	2	3	8	3
13	6	6	6	6	0	8	7	9	2	4	8	3
14	7	5	6	6	0	8	8	9	2	5	8	3
15	7	5	5	5	0	8	8	9	2	4	7	4
16	7	5	5	5	0	8	9	9	2	3	6	5
17	6	5	5	5	0	8	9	9	2	5	6	5
18	5	5	8	5	0	8	10	7	2	4	7	5
19	5	5	5	5	0	9	10	7	2	4	8	5
20	5	5	5	5	5	9	10	5	2	4	8	4
21	5	5	5	5	10	9	10	5	2	4	8	4
22	7	5	7	6	10	9	8	6	3	4	8	4
23	7	5	7	6	10	9	8	6	3	3	6	4
24	8	5	8	6	10	8	10	5	3	5	7	4
25	9	5	7	6	10	8	13	5	3	6	7	4
26	10	4	7	7	10	8	13	3	4	5	6	4
27	10	7	8	7	11	8	13	4	4	4	5	3
28	10	7	7	6	11	8	13	5	4	4	4	3
29	10	7	7	6	-------	8	13	4	3	4	6	3
30	10	7	7	6	-------	8	11	4	3	5	6	3
31	9	-------	8	6	-------	7	-------	4	-------	7	6	-------

Monthly discharge of Michelana Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	10	5	6.9	424
November	10	5	6.7	399
December	8	5	6.4	394
January	8	5	6.1	375
February	11	0	4.8	267
March	12	7	8.6	529
April	13	7	9.3	553
May	9	4	6.9	424
June	5	2	3.0	179
July	7	3	4.3	264
August	8	4	6.4	394
September	6	3	4.2	250
The year	13	0	6.1	4,450

FOURNESS CANAL NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In SE. ¼ SE. ¼ sec. 35, T. 6 S., R. 27 E., three-quarters of a mile below intake and 8 miles east of Solomonsville, Graham County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; December 20, 1920, to September 30, 1922.

GAGE.—Vertical staff on right bank 300 feet below waste gate; read by David Jurado.

DISCHARGE MEASUREMENTS.—Made by wading at gage.

CHANNEL AND CONTROL.—Bed composed of silt. Channel small and uniform in cross section. No well-defined control.

DIVERSIONS.—No diversions above gage.

ACCURACY.—Stage-discharge relation not permanent. Rating curves fairly well defined. Gage read to half-tenths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records fair.

Canal diverts water from left side of Gila River in NE. ¼ sec. 1, T. 7 S., R. 27 E., for irrigating about 260 acres near Solomonsville.

Discharge measurements of Fourness Canal near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	H. D. Empie	5.10	4.6	May 2	H. D. Empie	4.30	0.66
Dec. 1	do	5.12	3.9	June 1	do	4.30	.48
Jan. 1	do	4.65	.98	July 5	do	4.55	2.6
Feb. 1	do	5.05	3.9	Aug. 1	do	4.82	5.5
Mar. 1	do	5.16	4.4	Sept. 1	do	4.28	.42
Apr. 19	J. H. Gardiner	4.63	4.4				

Daily discharge, in second-feet, of Fourness Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	2.5	3.0	1.0	3.5	3.5	3.0	0.6	0.5	1.5	3.5	0.5
2	4.5	2.5	2.5	1.0	3.5	4.0	3.0	.6	.4	3.0	3.0	.5
3	2.0	0	2.5	1.0	2.0	4.0	3.0	.6	.4	2.0	2.0	.9
4	2.0	0	2.5	0	0	4.0	3.0	.6	.4	2.0	2.0	1.0
5	2.0	.8	2.5	0	0	4.0	3.0	.6	.5	2.0	2.0	1.0
6	2.0	1.5	2.5	0	0	4.0	3.0	.6	.5	2.5	2.0	1.0
7	2.0	1.5	2.5	2.0	0	2.5	3.0	.6	.5	3.5	2.0	1.0
8	2.0	2.5	2.5	2.0	0	2.0	0	.6	.5	4.0	3.0	1.0
9	2.0	2.0	2.5	2.0	1.0	2.0	0	.6	.5	5.0	4.0	1.0
10	2.0	2.0	1.5	2.0	2.5	1.5	0	.6	.5	6.5	3.0	1.0
11	1.5	2.0	1.5	2.0	2.5	1.5	0	.6	.5	6.5	3.0	0
12	1.5	2.0	1.5	2.0	2.5	1.5	0	.6	.5	6.5	4.0	0
13	2.5	2.0	1.5	2.0	2.5	1.5	0	.6	.5	2.0	2.0	0
14	2.5	2.0	1.5	2.0	2.5	1.5	0	.6	.5	2.0	0	.7
15	2.5	2.0	1.5	2.0	3.0	1.5	5.0	.5	.5	1.5	0	1.0
16	2.5	2.5	2.0	2.0	3.0	1.5	5.0	.5	.5	1.5	0	1.0
17	3.0	3.0	2.0	2.0	3.0	1.5	5.0	.5	.5	4.0	.7	1.0
18	3.0	3.0	2.5	2.0	3.0	3.0	4.5	.5	.5	4.0	1.5	1.0
19	3.0	3.0	2.5	2.0	3.0	3.5	4.0	.5	.5	3.0	1.5	0
20	3.0	3.0	2.5	2.0	3.0	4.0	3.5	.5	.4	2.5	1.5	0
21	3.0	3.0	2.5	2.0	2.5	4.0	3.5	.5	.4	2.0	1.0	1.0
22	3.0	2.5	2.5	2.5	2.5	4.0	3.5	.5	.5	2.0	1.0	2.0
23	2.0	2.5	2.5	1.0	2.5	4.0	3.0	.5	.5	2.0	1.0	1.5
24	2.0	2.5	2.0	0	3.0	3.0	3.0	.5	.6	2.0	1.0	1.5
25	2.0	2.5	2.0	0	3.0	3.0	3.0	.5	.5	1.5	.9	1.5
26	2.0	2.5	2.0	0	3.0	3.0	2.0	.5	.5	1.5	.9	1.5
27	3.0	2.5	2.0	2.0	3.0	3.0	1.5	.5	1.0	1.5	.9	2.0
28	3.0	2.5	2.0	2.0	3.0	3.0	1.0	.5	1.5	1.5	.7	2.0
29	3.0	3.0	2.0	2.0	-------	3.0	.5	.5	0	1.5	.7	2.0
30	3.0	3.0	.6	2.5	-------	3.0	.6	.5	0	4.0	.5	2.0
31	3.0	-------	1.0	3.0	-------	3.0	-------	.5	-------	4.0	.5	-------

Monthly discharge of Fourness Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4.5	1.5	2.50	154
November	3	0	2.21	132
December	3	.6	2.08	129
January	3	0	1.55	95
February	3.5	0	2.25	125
March	4	1.5	2.85	175
April	5	0	2.32	138
May	.6	.5	.55	34
June	1.5	0	.50	30
July	6.5	1.5	2.87	176
August	4	0	1.61	99
September	2	0	1.02	61
The year	6.5	0	1.86	1,350

SAN JOSE CANAL NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In NW. ¼ NE. ¼ sec. 10, T. 7 S., R. 27 E., near Curtis ranch, 2 miles below intake, and 4 miles east of Solomonsville, Graham County.

RECORDS AVAILABLE.—April 1, 1914, to September 30, 1915; December 21, 1920, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder installed April 13, 1922, 50 feet above concrete drop, 200 feet below waste gate, and 2 miles below heading; inspected by H. D. Empie. Prior to installation of recorder, vertical staff at same location and datum; read by Gonzalo Palma.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge at gage.

CHANNEL AND CONTROL.—Wide uniform section, well-defined banks. Control is formed by concrete drop 50 feet below gage.

DIVERSIONS.—One diversion above gage, irrigating 90 acres.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Staff gage read to hundredths twice a day until April 13. Operation of water-stage recorder satisfactory April 13 to September 30. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Canal diverts water from left side of Gila River in the SW. ¼ sec. 36, T. 6 S. R. 27 E., for irrigating 3,000 acres near Solomonsville and Safford.

Discharge measurements of San Jose Canal near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 1	H. D. Empie	0.94	76.6	May 4	H.D.Empie	0.50	29.6
Nov. 2	do	.54	33.0	June 1	do	.43	24.3
Dec. 1	do	.62	41.1	July 1	do	.50	30.7
Jan. 2	do	.64	43.0	24	J.H. Gardiner	.48	28.6
Feb. 1	do	.64	42.9	Aug. 1	H. D. Empie	.52	32.0
Mar. 1	do	.56	35.0	Sept. 1	do	.48	27.1
31	J. H. Gardiner	.66	45.3	14	J. H. Gardiner	.54	33.6
Apr. 13	H. D. Empie	.64	42.6	30	H. D. Empie	.45	24.6
20	J. H. Gardiner	.62	40.4				

Daily discharge, in second-feet, of San Jose Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	35	42	44	44	37	45	24	25	31	33	28
2	62	34	42	43	43	37	45	25	25	30	52	27
3	60	33	42	45	43	31	46	32	25	25	76	34
4	62	32	42	49	43	35	49	31	25	27	60	33
5	60	33	42	47	43	36	64	31	23	25	40	30
6	52	33	44	49	42	37	65	30	20	27	34	36
7	42	32	46	49	42	35	56	30	18	30	30	39
8	43	33	46	40	48	36	65	30	18	28	30	30
9	44	33	46	42	65	34	65	30	10	32	74	30
10	42	33	45	42	58	34	65	30	18	39	57	42
11	38	33	46	46	45	32	66	30	17	34	35	34
12	32	33	45	44	45	34	65	28	18	32	33	47
13	32	33	44	44	46	28	54	25	18	30	49	37
14	34	33	44	43	49	35	43	19	17	30	38	31
15	33	33	42	42	50	35	43	26	17	29	45	29
16	33	33	42	43	50	34	38	26	17	22	14	30
17	33	33	42	44	52	34	43	26	18	28	0	29
18	34	34	40	43	52	33	43	26	18	31	34	30
19	33	33	39	43	53	33	43	25	15	29	47	28
20	33	34	43	43	53	34	36	25	14	29	42	35
21	32	33	46	43	54	37	30	25	15	27	45	35
22	31	34	45	41	52	39	30	25	10	28	49	42
23	33	34	42	43	48	36	29	25	16	27	56	47
24	34	34	42	42	47	37	28	26	16	28	79	39
25	34	34	44	44	45	35	28	25	17	44	73	33
26	34	36	42	44	44	35	30	18	18	39	64	31
27	35	36	44	43	40	35	30	25	19	34	59	29
28	37	39	46	43	36	45	29	25	22	28	65	28
29	36	40	44	43	-------	45	29	25	31	22	45	28
30	38	40	42	43	-------	45	28	25	42	30	26	29
31	36	-------	43	43	-------	45	-------	25	-------	28	26	-------

Monthly discharge of San Jose Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	77	31	40.6	2,500
November	40	32	34.1	2,030
December	46	39	43.4	2,670
January	49	40	43.8	2,690
February	65	36	47.6	2,640
March	45	28	36.1	2,220
April	66	28	44.3	2,640
May	32	18	26.4	1,620
June	42	10	19.4	1,150
July	44	22	29.8	1,830
August	79	0	45.5	2,800
September	47	27	33.3	1,980
The year	79	0	37.0	26,800

MONTEZUMA CANAL NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In SE. ¼ NW. ¼ sec. 17, T. 7 S., R. 27 E., 1 mile below intake and 2 miles east of Solomonsville, Graham County.

RECORDS AVAILABLE.—April 1, 1914, to September 30, 1915; December 29, 1920, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder installed June 26, 1922, on left bank 200 feet below waste gate; inspected by H. D. Empie. Prior to June 26, 1922, staff gage 1 mile below waste gate; read by Frank Carrasco.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge at gage.

CHANNEL AND CONTROL.—Bed composed of silt; banks vertical. No well-defined control.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curves fairly well defined. Gage read to half-tenths twice a day until June 26. Operation of water-stage recorder satisfactory June 26 to September 30. Daily discharge ascertained by applying mean daily gage height to rating table. Shifting-control method used for several short periods prior to June 26. Records fair.

Canal diverts water from left side of Gila River in NE. ¼ sec. 17, T. 7 S., R. 27 E., for irrigating 3,750 acres near Solomonsville and Safford.

Discharge measurements of Montezuma Canal near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 5	H. D. Empie	6.33	45.4	May 12	H. D. Empie	8.80	27.2
21	do	6.37	42.9	15	do	8.80	27.4
23	do	5.93	33.7	June 3	do	8.72	25.8
Nov. 1	do	6.10	37.9	13	do	8.72	25.4
Dec. 2	do	5.88	31.2	15	do	8.60	22.9
Jan. 5	do	6.50	47.7	July 2	do	8.60	25.0
Feb. 3	do	6.25	48.7	7	do	8.74	28.9
26	do	6.07	44.9	10	do	9.24	45.2
Mar. 3	do	6.15	49.5	13	do	8.60	23.9
16	do	6.30	47.6	23	J. H. Gardiner	8.62	24.8
23	do	6.00	44.9	Aug. 1	H. D. Empie	8.80	30.6
Apr. 14	do	6.60	70.9	3	do	9.94	68.5
20	J. H. Gardiner	6.25	59.2	8	do	8.76	29.2
21	H. D. Empie	5.77	37.9	13	do	10.16	77.5
24	do	5.72	37.2	Sept. 1	do	8.61	25.2
May 8	do	5.48	28.4	14	J. H. Gardiner	8.86	32.6
Apr. 28[a]	Gardiner and Empie	8.96	32.8	20	H. D. Empie	8.98	35.2
May 1	H. D. Empie	9.14	36.7	26	do	9.02	39.1
5	do	8.93	29.4				

[a] Beginning on this date, measurements made at new station, 1 mile below intake.

Daily discharge, in second-feet, of Montezuma Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	39	39	37	50	51	62	29	28	26	31	24
2	54	39	33	41	54	47	62	29	24	26	50	28
3	49	42	34	41	55	47	58	26	26	26	68	29
4	47	42	36	41	48	46	58	26	26	24	52	32
5	44	39	38	38	52	50	58	23	26	23	34	28
6	44	39	38	38	56	52	56	24	26	23	28	29
7	48	39	41	38	56	48	54	26	24	24	28	34
8	48	42	38	42	52	48	60	26	23	32	28	24
9	48	42	38	42	46	48	62	26	23	28	54	26
10	47	39	38	45	48	43	58	26	24	24	40	42
11	45	39	38	42	56	47	58	26	24	32	34	44
12	47	35	38	40	56	47	62	26	24	28	31	49
13	43	39	38	40	56	47	62	26	23	26	73	35
14	42	39	40	44	56	45	77	26	23	26	64	31
15	44	42	40	44	49	45	77	24	23	24	64	31
16	42	39	36	44	41	44	77	26	23	24	0	29
17	42	35	36	44	43	45	66	26	23	26	0	29
18	45	37	36	42	41	52	66	23	23	22	8	31
19	45	35	36	44	49	47	59	23	23	23	11	29
20	45	35	38	47	49	49	55	26	23	26	13	35
21	39	35	40	47	44	54	41	26	22	26	23	40
22	40	39	40	47	44	52	40	24	23	23	30	47
23	42	39	36	47	49	53	40	24	23	23	32	52
24	46	39	36	48	49	49	43	26	23	24	71	44
25	46	37	36	48	49	49	49	26	23	45	71	36
26	40	39	34	48	59	52	36	26	26	34	59	33
27	39	39	34	49	55	54	32	26	29	31	52	29
28	39	40	34	49	51	54	36	26	29	28	44	28
29	39	39	34	46	-------	52	32	24	29	24	32	28
30	39	39	34	49	-------	54	34	29	32	26	28	26
31	42	-------	37	49	-------	52	-------	29	-------	24	26	-------

Monthly discharge of Montezuma Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	54	39	44.2	2,720
November	42	35	38.7	2,300
December	41	33	36.9	2,270
January	49	37	43.9	2,700
February	59	41	50.5	2,800
March	54	43	49.1	3,020
April	77	32	54.3	3,230
May	29	23	25.8	1,590
June	32	22	24.7	1,470
July	45	22	26.5	1,630
August	73	0	38.0	2,340
September	52	24	33.4	1,990
The year	77	0	38.8	28,100

UNION CANAL NEAR SOLOMONSVILLE, ARIZ.

LOCATION.—In SE. ¼ NE. ¼ sec. 14, T. 7 S., R. 26 E., 1¾ miles below intake and 1½ miles northwest of Solomonsville, Graham County.

RECORDS AVAILABLE.—April 1, 1914, to September 30, 1915; January 1, 1921, to September 30, 1922.

GAGE.—Stevens continuous water-stage recorder installed June 11, 1922, on left bank 1,300 feet below waste gate; inspected by H. D. Empie. Prior to June 11, 1922; staff on right bank; read by M. R. Nanez.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge at gage.

CHANNEL AND CONTROL.—Bed composed of silt and sand; banks vertical. No well-defined control.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curves fairly well defined. Gage read twice a day to nearest two-hundredths until June 11. Operation of water-stage recorder satisfactory June 11 to September 30. Daily discharge ascertained by applying mean daily gage height to rating tables. Shifting-control method used for several short periods. Records fair.

Canal diverts water from left side of Gila River in the NW. ¼ sec. 18, T. 7 S., R. 27 E., for irrigating 5,975 acres near Safford and Thatcher.

Discharge measurements of Union Canal near Solomonsville, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 5	H. D. Empie	2.65	63.0	June 6	H. D. Empie	0.72	6.0
26	do	2.38	55.9	9	do	.85	10.2
Nov. 1	do	2.56	60.9	12	do	.75	6.5
26	do	2.84	72.0	30	do	1.75	32.0
Dec. 2	do	3.63	104	July 2	do	1.76	35.7
Jan. 5	do	1.72	34.8	8	do	2.24	48.5
Feb. 3	do	3.12	90.2	24	J. H. Gardiner	1.27	19.1
26	do	2.33	54.4	27	H. D. Empie	2.18	48.9
Mar. 7	do	3.15	95.7	Aug. 1	do	3.64	111
Apr. 11	do	2.94	86.6	8	do	1.12	15.8
20	J. H. Gardiner	2.02	48.0	17	do	3.65	123
May 1	H. D. Empie	2.44	62.9	Sept. 1	do	1.62	28.9
9	do	2.06	48.2	5	do	1.69	29.7
19	do	1.36	22.9	14	J. H. Gardiner	1.88	41.9
22	do	1.38	23.2	30	do	1.56	24.6
31	do	1.04	14.0				

Daily discharge, in second-feet, of Union Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	63	116	65	93	87	70	63	6.8	39	58	33
2	75	61	101	63	95	95	70	62	8.0	30	121	43
3	73	65	88	61	96	90	78	60	5.5	27	58	47
4	71	61	88	60	93	93	140	59	3.5	21	39	40
5	69	61	92	34	89	96	119	55	6.8	20	38	32
6	67	63	61	27	84	96	129	59	5.5	14	28	40
7	69	63	58	27	89	86	137	57	6.8	38	24	52
8	65	61	83	33	86	80	97	57	4.5	72	18	37
9	69	63	92	33	86	76	88	48	5.5	96	60	40
10	58	63	90	32	120	74	84	45	5.5	49	54	67
11	60	63	92	48	64	68	91	44	5.5	52	56	54
12	61	63	83	48	45	70	65	43	5.5	51	73	58
13	63	63	81	47	70	58	60	46	6.8	34	131	46
14	60	46	79	44	81	53	75	44	4.5	34	119	44
15	60	32	79	44	81	80	74	39	4.5	32	117	40
16	56	42	77	54	79	80	68	34	5.5	27	122	29
17	56	44	75	63	75	68	64	31	6.8	40	121	32
18	52	40	75	63	71	64	61	22	4.5	24	118	40
19	46	39	75	63	71	66	54	22	4.5	18	77	47
20	46	42	79	62	65	74	56	24	4.5	14	101	81
21	52	63	67	61	61	102	57	24	4.5	30	84	72
22	56	63	65	57	66	109	65	24	5.5	42	72	84
23	56	63	63	55	62	104	69	24	9.2	26	50	96
24	56	61	65	57	62	84	67	24	8.0	21	32	52
25	69	60	71	85	62	92	61	24	10	88	17	44
26	73	61	71	87	58	95	63	20	13	49	11	37
27	73	96	73	86	65	98	67	21	13	46	5	36
28	73	92	71	84	74	84	67	20	35	36	9.2	28
29	69	83	67	88	-------	75	65	20	27	28	33	25
30	67	96	69	86	-------	74	65	17	48	30	46	27
31	60	-------	65	91	-------	71	-------	9.2	-------	26	33	-------

Monthly discharge of Union Canal near Solomonsville, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	85	46	63.4	3,900
November	96	32	61.2	3,640
December	116	58	77.8	4,780
January	91	27	58.3	3,580
February	120	45	76.5	4,250
March	109	53	82.0	5,040
April	140	54	77.5	4,610
May	63	9.2	36.8	2,260
June	48	3.5	9.47	564
July	96	14	37.2	2,290
August	131	5	62.1	3,820
September	96	25	46.8	2,780
The year	140	3.5	57.4	41,500

SAN SIMON CREEK NEAR RODEO, N. MEX.

LOCATION.—In SE. ¼ sec. 6, T. 27 S., R. 21 E., 10 miles north of Rodeo, Hidalgo County, N. Mex.

DRAINAGE AREA.—454 square miles (measured on topographic maps).

RECORDS AVAILABLE.—March 25, 1920, to September 30, 1922.

GAGE.—Vertical staff in midstream; read by A. J. Love.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Uniform channel 300 feet wide, covered with sacaton grass and small mesquite.

EXTREMES OF DISCHARGE.—Trace of water only on August 8. Dry during remainder of year.

1920–1922: Maximum daily mean discharge, 1,340 second-feet July 25, 1921. Creek dry during greater part of each year.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stream dry during year except on August 8. Records good.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer:

SAN SIMON CREEK NEAR SAN SIMON, ARIZ.

LOCATION.—In SW. ¼ sec. 29, T. 13 S., R. 31 E., 1 mile east of San Simon, Cochise County.

DRAINAGE AREA.—938 square miles (measured on topographic maps).

RECORDS AVAILABLE.—August 1, 1919, to September 30, 1922.

GAGE.—Vertical enamel staff fastened to bridge, low-water section on right pier, high-water section on left pier; read by Ed Gentner.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel, scouring to heavy clay at high water. Low-water control is a gravel bar 50 feet below gage. High-water control formed by right angle turn to right 400 feet below station.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge for year, 680 second-feet on August 10; minimum discharge, zero flow greater part of year.

1919–1922: Maximum mean daily discharge, 1,070 second-feet on July 25, 1921; minimum discharge, zero flow greater part of each year.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation fairly permanent. Standard rating curve fairly well defined. Gage read to tenths once a day or oftener during floods. Daily discharge ascertained from discharge hydrographs prepared from discharge determined by applying each gage reading to rating table. Records fair.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer.

Daily discharge, in second-feet, of San Simon Creek near San Simon, Ariz., for the year ending September 30, 1922

Date	Discharge	Date	Discharge	Date	Discharge
Oct. 8	250	July 31	50	Aug. 15	15
Mar. 25	20	Aug. 1	80	16	7
June 11	35	9	150	17	15
12	145	10	680	18	390
26	15	12	10	19	45
27	340	13	10		
July 26	45	14	6		

NOTE.—Stream dry on days for which no discharge is given.

Monthly discharge of San Simon Creek near San Simon, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	250	0	8.06	496
March	20	0	.64	39
June	340	0	17.8	1,060
July	50	0	3.06	188
August	680	0	45.4	2,790
The year	680	0	6.32	4,570

CAVE CREEK NEAR PARADISE, ARIZ.

LOCATION.—In SW. ¼ SE. ¼ sec. 34, T. 17 S., R. 31 E., at Portal ranger station, 8 miles by road southeast of Paradise, Cochise County.

DRAINAGE AREA.—39 square miles (measured on topographic maps).

RECORDS AVAILABLE.—August 5, 1919, to September 30, 1922.

GAGE.—Vertical enamel staff on right bank 100 feet from ranger station; read by Mrs. Alice H. Scholefield.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Channel composed of gravel and boulders. Channel fairly straight and uniform in cross section.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.80 feet on August 16 (discharge, 110 second-feet); dry during part of year.

1919–1922: Maximum stage recorded, 5.30 feet August 7, 1921 (discharge, 3,360 second-feet); dry during a part of each year.

DIVERSIONS.—Cave Creek Canal diverts water from left side 700 feet above station. Records of this canal are published in this report. Another canal diverts water above this station to irrigate about 7½ acres.

REGULATION.—None.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curve fairly well defined. Gage read to two-hundredths once a day and oftener during floods. Daily discharge ascertained by applying mean daily gage height to rating table. Discharge hydrographs used during periods of flood. Records fair.

COOPERATION.—Records furnished by University of Arizona, Professor G. E. P. Smith, irrigation engineer.

Discharge measurements of Cave Creek near Paradise, Ariz., during the year ending September 30, 1922

[Made by H. C. Schwalen]

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 12	0.73	0.36	Dec. 15	0.74	0.36
13	.72	.34	Mar. 19	.70	.25

Daily discharge, in second-feet, of Cave Creek near Paradise, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0.5	1.0			0.5	0.5	1.0	0.5			
2		.5	1.5	0.5		.5	.5	1.0				
3		.5	1.5	.5		.5	.5	1.0				
4		.5	1.5	1.0		.5	.5	1.0				
5		.5	1.5			.5	.5	1.0				
6	0.5	.5	2.0	.5		.5	.5	1.0				1.0
7	.5	.5	3.0	.5		.5	.5	1.0				
8		.5	3.0	.5		.5	.5	1.0		3.5		
9		.5	3.0	.5		.5	.5	1.0				
10		.5	3.0	.5		.5	.5	1.0				
11		.5	3.0	.5		.5	.5	1.0				
12	.5	.5	3.0	.5		.5	.5	1.0				
13	.5	.5	3.0	.5		.5	.5	1.0			1.5	
14	.5	.5	3.0	.5		.5	.5	1.0			4.5	
15		.5	.5	.5		.5	.5	1.0			8.0	
16		.5	.5	.5		.5	.5	1.0			110.0	
17		.5	.5	.5		.5	.5	1.0			91.0	
18		.5	.5				.5	1.0			91.0	
19		.5	.5				.5	1.0			61.0	
20		.5	.5				.5	1.0			61.0	
21		.5	.5				1.0	1.0			4.0	
22		.5					1.0	1.0			4.0	
23		1.0					1.0	1.0			1.0	
24		1.0					1.0	.5			1.0	
25	.5	.5				.5	1.0	.5			1.0	
26	.5	.5				.5	1.0	.5			1.0	
27	.5	.5				.5	1.0	.5				
28	.5	.5			0.5	.5	1.0	.5				
29	.5	1.0				.5	1.0	.5				
30	.5	1.0				.5	1.0	.5				
31	.5					.5		.5				

NOTE.—Trace only on days for which no discharge is given, except on June 10 to July 7, July 9 to Aug. 12, Aug. 27 to Sept. 7-30, when the stream was dry.

Monthly discharge of Cave Creek near Paradise, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	0.5	[a] T.	0.19	12
November	1	0.5	.57	34
December	3	T.	1.18	73
January	1	T.	.42	26
February	.5	T.	.02	1
March	.5	T.	.39	24
April	1	.5	.67	40
May	1	.5	.87	53
June	.5	0	.02	1
July	3.5	0	.11	7
August	110	0	14.2	873
September	1	0	.03	2
The year	110	0	1.58	1,150

[a] Trace of water only.

CAVE CREEK CANAL NEAR PARADISE, ARIZ.

LOCATION.—In SW. ¼ SE. ¼ sec. 34, T. 17 S., R. 31 E., at Portal ranger station of United States Forest Service, 750 feet below head of canal, and 8 miles by road southeast of Paradise, Cochise County.

RECORDS AVAILABLE.—October 14, 1919, to September 30, 1922.

GAGE.—Vertical staff on left bank; read by Mrs. Alice H. Scholefield.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Earth section. Bed composed of small gravel.

DIVERSIONS.—Above all diversions from canal.

ACCURACY.—Stage-discharge relation continually changing. Rating curve poorly defined. Gage read to half-tenths once a day. Daily discharge ascertained by applying daily gage height to rating table. Records poor.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer.

Canal diverts water from left bank of Cave Creek in SE. ¼ SW. ¼ sec. 34, T. 17 S., R. 31 E., for irrigating 113 acres near Portal ranger station. When sufficient water is available, 176 additional acres are irrigated. A part of the water for this additional acreage is diverted from Cave Creek, below gaging station on Cave Creek, to Cave Creek Canal through a secondary carrier known as Portal-Reay ditch. Water carried by Portal-Reay ditch does not pass gaging station on Cave Creek Canal.

Discharge measurements of Cave Creek Canal near Paradise, Ariz., during the year ending September 30, 1922

[Made by H. C. Schwalen]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
Oct. 12	1.30	0.78
Dec. 15	1.37	.79
Mar. 19	[a] 7.31	.50

[a] New gage datum.

Daily discharge, in second-feet, of Cave Creek Canal near Paradise, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Sept.
1	1.6	0.4	0.7	0.7	0.7	0.5	1.3	1.8			1.8
2	.9	.4	.7	1.0	.7	.5	1.3	1.8			.7
3	1.6	.4	.7	1.0	.7	.5	1.8	1.0			1.8
4	1.2	.4	.7	.5	.7	.5	1.8	1.0			1.8
5	.9	.4	1.0	.7	.7	.5	1.8	1.0			1.8
6	2.7	.4	1.0	.7	.7	.5	1.3	1.0			4.3
7	1.6	.4	1.0	.7	.7	.5	1.8	1.0			3.6
8	1.6	.4	1.0	.7	.7	.5	1.8	1.0	1.5		2.6
9	1.6	.6	1.0	.7	.7	.5	1.3	1.0		1.8	2.6
10	1.6	.6	1.0	1.0	.7	.5	1.3	1.0		1.8	2.6
11	1.6	.6	1.0	1.0	.7	.5	1.3	1.0		1.8	2.6
12	.9	.6	1.0	1.0	.7	1.0	1.3	.7		1.8	2.6
13	.9	.5	1.0	1.0	.5	1.0	1.3	.7		1.8	2.6
14	.9	.3	1.0	1.0	.5	.5	1.3	.7		2.9	1.8
15	.9	.2	1.0	1.0	.5	.5	1.3	.7		.9	1.8
16	.9	.2	1.0	1.0	.5	.5	1.8	.7			1.8
17	.9	.2	1.0	1.0	.5	.5	1.8	.7			1.0
18	.9	.2	1.0	.7	.5	.5	1.8	.5			1.0
19	.5	.2	1.0	.7	.5	.5	1.8	.5			1.0
20	.9	.2	1.0	.7	.1	.5	1.8	.5			1.0
21	.7	.2	1.0	.7	.1	.5	1.8	.1		2.9	1.0
22	.5	.2	.7	.7	.1	.5	1.8	.1		2.9	1.3
23	.5	.2	.7	.7	.3	.5	1.8			1.8	1.0
24	.9	.2	.7	.7	.3	.5	1.8			1.8	.7
25	.9	.3	.7	.7	.3	1.3	1.8			1.4	.7
26	.9	.3	.7	.7	.3	1.3	1.8			1.4	.7
27	.9	.3	.7	.7	.3	1.4	1.3			1.0	.7
28	.6	.5	.7	.7	.5	1.4	1.8			1.0	.7
29	.6	.7	.7	.7		1.4	1.8			1.0	.7
30	.6	.7	.7	.7		1.3	1.8			1.0	.7
31	.6		.7	.7		1.3				1.8	

NOTE.—Canal dry on days for which no discharge is given.

Monthly discharge of Cave Creek Canal near Paradise, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2.7	0.5	1.04	64
November	.7	.2	.37	22
December	1.0	.7	.86	53
January	1.0	.5	.79	49
February	.7	.1	.51	28
March	1.4	.5	.72	44
April	1.8	1.3	1.62	96
May	1.8	0	.60	37
July	1.5	0	.05	3
August	2.9	0	.99	61
September	4.3	.7	1.63	97
The year	4.3	0	.77	554

EAST TURKEY CREEK AT PARADISE, ARIZ.

LOCATION.—In SW. ¼ sec. 19, T. 17 S., R. 31 E., at Paradise, Cochise County.

DRAINAGE AREA.—8 square miles (measured on topographic map).

RECORDS AVAILABLE.—August 4, 1919, to September 30, 1922.

GAGE.—Vertical enamel staff on right bank 300 feet downstream from post office; read by John Hancock.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of boulders and gravel. Control formed by concrete wall extending at an angle across channel. Channel fairly uniform in cross section.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge for year, 18 second-feet August 19; creek dry during periods of year.

1919–1922: Maximum mean daily discharge, 170 second-feet August 18, 1921; minimum discharge, dry for periods of each year.

DIVERSIONS.—Several small diversions above station, most of water returns to creek above station.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curve poorly defined. Gage read to nearest two-hundredths twice a week and oftener during floods. Daily discharge ascertained by applying gage heights to rating table, and interpolating for days when gage was not read. Records fair.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer.

Discharge measurements of East Turkey Creek at Paradise, Ariz., during the year September 30, 1922

[Made by H. C. Schwalen]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
Dec. 15	0.00	0.14
Mar. 3	.18	.42

Daily discharge, in second-feet, of East Turkey Creek at Paradise, Ariz., for the year ending September 30, 1922

Date	Discharge	Date	Discharge	Date	Discharge
Mar. 13	0.5	Mar. 19	0.5	Mar. 25	0.5
14	.5	20	.5	July 8	2
15	.5	21	.5	Aug 19	18
16	.5	22	.5	20	2
17	.5	23	.5	Sept. 1	1.5
18	.5	24	.5	5	.5

NOTE.—Trace only Oct. 1 to June 2, except for the period Mar. 13–25. Dry June 3 to Sept. 30, except for July 8, Aug. 19, and 20, and Sept. 1 and 5.

Monthly discharge of East Turkey Creek at Paradise, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	0.5	* T	0.21	13
July	2	0	.06	4
August	18	0	.65	40
September	1.5	0	.05	3

* Trace.

GRAHAM CANAL NEAR SAFFORD, ARIZ.

LOCATION.—In NE. ¼ SW. ¼ sec. 5, T. 7 S., R. 26 E., near Hatfield ranch, a mile below intake, and 2 miles north of Safford, Graham County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; December 30, 1920, to September 30, 1922.

GAGE.—Vertical staff on left bank 600 feet below waste gate; read by J. M. Hatfield.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge at gage.

CHANNEL AND CONTROL.—Bed composed of silt; frequently covered by deposits of sand; shifting. No well-defined control.

DIVERSIONS.—One diversion just above gage; irrigates 52 acres.

ACCURACY.—Stage-discharge relation not permanent. Standard rating curve well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Shifting-control method used for entire year. Records good.

Canal diverts water from right side of Gila River in the NW. ¼ sec. 9, T. 7 S., R. 26 E., for irrigating 2,577 acres near Safford.

Discharge measurements of Graham Canal near Safford, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft*
Oct. 3	H. D. Empie	5.42	35.2	June 18	H. D. Empie	4.65	10.5
Nov. 1	do	5.46	45.6	July 2	do	4.67	10.7
30	do	5.34	36.0	7	do	4.53	5.9
Jan. 2	do	5.58	46.4	24	J. H. Gardiner	4.55	9.1
Feb. 3	do	5.26	31.4	Aug. 4	H. D. Empie	4.85	9.9
Mar. 3	do	5.28	36.9	28	do	5.20	24.3
Apr. 14	do	5.10	25.3	31	do	4.85	7.6
21	J. H. Gardiner	5.50	45.4	Sept. 5	do	4.85	7.6
May 1	H. D. Empie	5.00	26.4	18	do	4.88	4.7
June 4	do	4.75	13.2	25	do	4.95	11.0
7	do	4.65	9.9	27	do	4.90	8.2

Daily discharge, in second-feet, of Graham Canal near Safford, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	45	30	45	33	31	25	26	11	12	12	6
2	43	42	43	45	33	33	30	25	12	10	54	16
3	39	44	50	45	31	31	30	24	5	9	18	15
4	39	44	50	50	24	33	54	23	12	7	8	12
5	37	44	48	50	22	37	54	24	9	7	8	4
6	34	44	58	47	26	33	60	26	7	9	7	9
7	32	42	45	47	30	31	62	24	8	7	9	31
8	34	39	38	47	32	45	46	24	8	17	6	20
9	58	42	38	47	34	38	46	23	8	26	21	23
10	41	43	34	47	28	30	35	23	8	18	25	21
11	35	46	38	47	26	32	31	23	7	11	23	0
12	35	48	45	55	38	34	27	23	9	8	17	0
13	35	48	45	55	27	36	20	21	6	7	41	0
14	34	50	45	27	29	42	24	21	17	10	37	0
15	34	50	45	36	32	38	22	21	6	7	41	3
16	30	53	43	38	32	38	22	20	8	8	19	7
17	29	52	42	38	31	38	25	19	9	8	26	4
18	29	55	42	38	26	38	25	17	8	7	30	2
19	27	58	42	40	24	38	27	17	6	7	38	7
20	25	65	42	40	28	39	30	15	9	7	34	7

Daily discharge, in second-feet, of Graham Canal near Safford, Ariz., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	26	57	42	40	30	39	45	15	8	7	28	10
22	31	56	40	40	32	29	40	16	8	9	30	4
23	32	54	42	40	36	26	30	16	8	9	22	19
24	32	44	47	38	25	25	28	14	8	8	16	12
25	38	37	52	18	28	25	25	14	8	17	24	11
26	45	29	45	0	25	27	24	14	9	36	31	10
27	45	27	50	13	25	27	27	14	9	27	24	3
28	46	35	45	27	33	27	26	14	16	45	23	1
29	46	39	45	33	-------	25	26	12	12	10	13	2
30	46	41	45	35	-------	25	26	12	15	9	11	6
31	44	-------	45	35	-------	25	-------	12	-------	10	6	-------

Monthly discharge of Graham Canal near Safford, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	58	25	37.2	2,290
November	65	35	45.8	2,730
December	58	30	43.9	2,700
January	55	0	38.8	2,390
February	38	22	29.3	1,630
March	45	25	32.7	2,010
April	62	20	33.1	1,970
May	26	12	19.1	1,170
June	16	5	9.1	542
July	45	7	12.5	769
August	54	6	22.6	1,390
September	31	0	8.8	524
The year	65	0	27.8	20,100

SMITHVILLE CANAL NEAR THATCHER, ARIZ.

LOCATION.—In NW. ¼ sec. 35, T. 6 S., R. 25 E., three-quarters of a mile below intake and 1½ miles north of Thatcher, Graham County.

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1915; December 23, 1920, to September 30, 1922.

GAGE.—Vertical enamel section on left bank 300 feet below waste gate; read by Patricia Vasquez.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Uniform section; banks vertical. No well-defined control.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation not permanent. Standard rating curve well defined. Gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table; shifting-control method used for entire year. Records good.

Canal diverts water from left side of Gila River in the NE. ¼ sec. 35, T. 6 S., R. 25 E., for irrigating 1,760 acres near Pima.

Discharge measurements of Smithville Canal near Thatcher, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 3	H. D. Empie	6.20	31.4	June 2	H. D. Empie	5.20	8.2
Nov. 1	do	6.32	30.9	12	do	5.14	6.3
Dec. 2	do	6.68	48.7	18	do	5.20	7.5
Jan. 4	do	6.40	42.8	July 2	do	5.15	7.5
Feb. 2	do	6.48	42.8	12	do	5.42	11.8
Mar. 2	do	5.86	23.1	24	J. H. Gardiner	5.02	5.5
Apr. 8	do	6.15	31.6	Aug. 2	H. D. Empie	6.75	46.9
18	J. H. Gardiner	5.60	15.8	9	do	6.64	41.6
May 1	H. D. Empie	5.80	21.5	Sept. 4	do	5.82	23.4
19	do	5.49	14.1	18	do	5.43	11.2

Daily discharge, in second-feet, of Smithville Canal near Thatcher, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	30	51	33	43	21	16	18	8	9	5	12
2	36	29	49	33	40	17	18	18	8	7	52	21
3	30	27	49	33	40	24	18	18	10	6	24	20
4	28	28	48	40	39	26	33	16	8	6	5	17
5	32	35	53	40	39	21	30	16	9	6	6	14
6	31	40	53	35	40	8	27	16	10	6	5	12
7	31	47	56	36	40	29	36	16	8	6	5	25
8	16	51	56	36	37	27	30	15	8	12	4	13
9	32	49	53	38	31	30	23	15	8	40	4	19
10	26	51	52	42	31	30	24	14	7	18	61	53
11	29	45	47	42	33	35	24	14	7	8	4	40
12	21	32	47	42	41	27	21	12	7	10	12	54
13	17	22	44	42	35	26	21	13	9	9	36	24
14	6	31	47	42	30	35	23	12	16	10	44	17
15	0	36	42	42	30	26	24	12	11	8	65	16
16	25	35	41	42	33	24	26	13	7	6	38	12
17	29	36	36	40	27	35	24	12	6	7	7	11
18	18	37	42	39	23	29	16	13	7	7	21	9
19	15	42	41	41	24	27	16	12	9	7	40	9
20	12	40	40	41	26	29	20	12	7	7	53	10
21	13	31	41	41	30	29	16	10	8	6	31	17
22	12	41	38	41	33	24	17	11	7	7	14	10
23	10	30	37	38	30	26	17	10	10	7	4	24
24	11	32	38	38	23	24	16	10	6	7	0	14
25	13	35	21	35	35	23	18	10	7	14	6	9
26	34	31	0	34	49	23	16	10	6	13	16	7
27	23	26	0	34	16	21	16	10	11	8	18	7
28	28	27	14	34	24	21	16	10	13	7	16	7
29	30	30	30	36	------	24	20	9	27	6	16	6
30	33	30	31	36	------	20	18	9	7	13	10	7
31	33	------	30	40	------	18	------	8	------	6	12	------

Monthly discharge of Smithville Canal near Thatcher, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	39	0	23.0	1,410
November	51	22	35.2	2,090
December	56	0	39.6	2,430
January	42	33	38.3	2,360
February	49	16	32.9	1,830
March	35	8	25.1	1,540
April	36	16	21.3	1,270
May	18	8	12.7	781
June	27	6	9.1	542
July	40	6	9.3	572
August	65	0	20.5	1,260
September	54	6	17.2	1,020
The year	65	0	23.6	17,100

DODGE-NEVADA CANAL NEAR PIMA, ARIZ.

LOCATION.—In NW. ¼ SE. ¼ sec. 18, T. 6 S., R. 25 E., a mile below intake and 1½ miles north of Pima, Graham County.

RECORDS AVAILABLE.—December 31, 1920, to September 30, 1922.

GAGE.—Vertical staff on right bank, half a mile below waste gate, and 200 feet upstream from siphon at county highway crossing; read by W. W. Crockett.

DISCHARGE MEASUREMENTS.—Made by wading at gage.

CHANNEL AND CONTROL.—Bed composed of silt; banks vertical; shifting. Control affected by siphon 200 feet below gage.

DIVERSIONS.—One diversion above gage; irrigates 14½ acres.

ACCURACY.—Stage-discharge relation not permanent. Rating curves well defined. Gage read to nearest two-hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating tables. Records good.

Canal diverts water from left side of Gila River in the NW. ¼ sec. 20, T. 6 S., R. 25 E., for irrigating 1,250 acres near Pima.

Discharge measurements of Dodge-Nevada Canal near Pima, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 3	H. D. Empie	1.84	11.1	Apr. 18	J. H. Gardiner	1.46	19.1
Nov. 3	do	1.98	17.4	May 3	H. D. Empie	1.31	15.9
Dec. 3	do	2.66	25.0	June 2	do	1.14	9.7
Jan. 4	do	2.91	27.9	July 3	do	.90	4.6
Feb. 2	do	2.18	22.6	Aug. 2	do	2.66	32.7
Mar. 2	do	1.48	16.5	Sept. 6	do	1.04	6.7
Apr. 15	do	1.58	21.7				

Daily discharge, in second-feet, of Dodge-Nevada Canal near Pima, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	19	14	9	25	18	20	16	9	5	5	0
2	18	18	18	11	24	17	19	17	9	5	12	0
3	12	18	23	13	24	16	19	17	9	4	13	0
4	12	17	24	15	24	14	20	17	9	4	11	3
5	14	14	24	21	24	14	20	17	9	4	6	6
6	14	15	26	20	23	15	28	17	8	4	6	5
7	15	16	27	19	23	18	33	16	8	4	5	7
8	12	17	22	21	24	18	34	16	8	4	5	9
9	22	17	22	18	24	20	30	16	8	4	18	8
10	15	20	22	20	24	20	26	16	7	5	27	14
11	23	22	23	20	23	18	24	16	7	5	5	13
12	11	22	24	21	21	19	23	16	8	5	5	7
13	12	22	24	20	19	18	21	16	7	5	7	7
14	22	14	23	19	10	18	22	16	20	5	10	7
15	24	13	18	19	0	17	24	12	13	5	10	6
16	16	12	16	20	0	16	22	13	9	4	12	5
17	20	13	17	20	0	16	21	12	8	5	0	5
18	13	14	18	19	0	16	19	12	8	4	14	5
19	13	15	18	17	0	17	19	11	8	5	13	5
20	14	20	19	17	0	18	20	11	7	5	14	5
21	12	25	20	18	0	18	21	11	7	5	14	6
22	12	24	14	19	0	20	21	11	7	4	7	6
23	14	18	13	19	0	20	21	10	7	5	0	6
24	12	16	13	27	14	22	22	10	7	5	10	5
25	12	16	14	25	28	22	22	10	7	5	12	5
26	14	14	14	24	24	22	22	10	6	6	7	5
27	15	14	15	23	20	20	21	10	7	5	6	4
28	16	15	17	23	19	16	16	10	6	5	5	4
29	16	14	18	23	------	18	15	10	17	5	5	4
30	18	14	21	26	------	20	15	10	8	5	0	4
31	20	------	17	27	------	20	------	9	------	5	0	------

Monthly discharge of Dodge-Nevada Canal near Pima, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	24	11	15.4	947
November	25	12	16.9	1,010
December	27	13	19.3	1,190
January	27	9	19.8	1,220
February	28	0	14.9	828
March	22	14	18.1	1,110
April	34	15	22.0	1,310
May	17	9	13.3	818
June	20	6	8.6	512
July	6	4	4.7	289
August	27	0	8.5	523
September	14	0	5.5	327
The year	34	0	13.9	10,100

CURTIS-KEMPTON CANAL NEAR EDEN, ARIZ.

LOCATION.—In SE. ¼ NE. ¼ sec. 4, T. 6 S., R. 24 E., on Chirstensen ranch 2 miles below intake and 1½ miles southeast of Eden, Graham County.

RECORDS AVAILABLE.—December 26, 1920, to September 30, 1922.

GAGE.—Vertical staff on left bank at ranch house 600 feet below waste gate; read by Mrs. William Carpenter and Frances Echols.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage or by wading.

CHANNEL AND CONTROL.—Bed composed of silt, banks vertical; shifting. Control affected by two checks just below gage.

DIVERSIONS.—Three diversions above gage; irrigates 87 acres.

ACCURACY.—Stage-discharge relation not permanent. Rating curves well defined. Gage read to half-tenths twice a day. Daily discharge ascertained by applying mean daily gage height to rating tables. Records good.

Canal diverts water from right side of Gila River in the NW. ¼ sec. 12, T. 6 S., R. 24 E., for irrigating 1,650 acres near Eden.

Discharge measurements of Curtis-Kempton Canal near Eden, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 3	H. D. Empie	4.92	21.1	June 2	H. D. Empie	4.18	9.1
Nov. 3	do	4.55	14.4	July 3	do	4.03	7.3
Dec. 3	do	5.18	31.8	9	do	4.94	23.3
Jan. 4	do	5.20	29.7	25	J. H. Gardiner	4.54	4.6
Feb. 2	do	5.10	26.7	Aug. 2	H. D. Empie	5.25	42.3
Mar. 2	do	4.68	19.2	Sept. 4	do	4.81	21.4
Apr. 15	do	4.50	16.2	11	do	5.24	38.7
18	J. H. Gardiner	4.67	21.6	23	do	4.72	17.2
May 3	H. D. Empie	4.40	17.3				

Daily discharge, in second-feet, of Curtis-Kempton Canal near Eden, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	22	25	31	32	21	19	17	9	9	6	12
2	24	21	26	31	28	19	12	19	9	7	19	31
3	20	13	32	28	27	19	17	17	8	6	21	19
4	17	15	30	27	28	19	21	16	8	6	9	18
5	12	20	30	25	25	19	21	16	9	6	7	14
6	14	28	27	25	25	21	19	14	21	6	7	14
7	13	25	23	27	26	19	22	14	6	6	6	15
8	15	23	25	30	26	19	24	14	6	7	6	14
9	32	21	25	31	25	20	21	14	6	15	17	14
10	23	17	30	30	12	24	25	9	6	19	37	23
11	22	19	25	27	0	27	17	11	6	10	28	26
12	17	14	18	27	0	25	16	13	6	9	25	13
13	23	21	20	27	0	21	15	14	6	7	25	12
14	19	25	25	27	0	23	27	12	9	7	40	10
15	19	23	26	31	0	23	10	14	5	6	43	10
16	23	16	27	31	0	27	14	11	6	6	28	12
17	24	23	27	26	0	22	19	11	6	6	10	10
18	9	28	27	23	23	20	19	10	11	6	18	10
19	7	23	27	22	30	21	19	10	6	6	43	9
20	11	25	31	24	25	23	20	10	4	6	38	9
21	14	25	32	26	24	15	19	10	6	6	25	9
22	14	23	30	30	30	11	18	10	6	6	10	10
23	15	28	30	33	25	23	19	12	6	4	6	18
24	19	28	30	36	23	17	19	10	6	4	2	5
25	21	28	32	34	23	17	19	10	6	4	0	5
26	16	33	31	34	14	17	21	9	6	7	0	8
27	19	31	27	34	16	17	20	9	6	6	0	6
28	18	31	25	34	20	18	12	10	7	6	0	6
29	23	30	30	34	-------	17	17	9	6	6	0	7
30	23	26	32	36	-------	17	17	9	7	6	0	6
31	23	-------	32	36	-------	17	-------	9	-------	6	0	-------

Monthly discharge of Curtis-Kempton Canal near Eden, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	32	7	18.5	1,140
November	33	13	23.5	1,400
December	32	18	27.6	1,700
January	36	22	29.6	1,820
February	32	0	18.1	1,010
March	27	11	19.9	1,220
April	27	10	18.6	1,110
May	19	9	12.0	738
June	21	4	7.2	428
July	19	4	7.0	430
August	43	0	15.4	947
September	31	5	12.5	744
The year	43	0	17.5	12,700

FORT THOMAS CONSOLIDATED CANAL AT ASHURST, ARIZ.

LOCATION.—In the NE. ¼ SE. ¼ sec. 30, T. 5 S., R. 24 E., 2 miles below intake, half a mile east of State highway, and 1 mile southeast of Ashurst, Graham County.

RECORDS AVAILABLE.—December 26, 1920, to September 30, 1922.

GAGE.—Vertical staff on right bank half a mile below waste gate; read by Tom Hundley.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Bed consists of silt and frequently covered by moss; shifting.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curves well defined. Gage read to half-tenths twice a day. Daily discharge ascertained by applying mean daily gage height to rating tables. Records good.

Canal diverts water from left side of Gila River in the NW. ¼ sec. 4, T. 6 S., R. 24 E., for irrigating 2,236 acres near Fort Thomas.

Discharge measurements of Fort Thomas Consolidated Canal at Ashurst, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Oct. 3	H. D. Empie	9.05	31	June 2	H. D. Empie	8.65	9.7
Nov. 3	do	8.90	27	July 3	do	8.03	4.2
Feb. 2	do	9.30	40.5	25	J. H. Gardiner	8.76	11.2
Mar. 2	do	8.65	18	Aug. 2	H. D. Empie	9.71	29.3
Apr. 18	J. H. Gardiner	8.67	14.5	Sept. 4	do	8.15	6.4
19	H. D. Empie	8.75	17.3	11	do	9.79	60.5
May 3	do	8.52	12				

Daily discharge, in second-feet, of Fort Thomas Consolidated Canal at Ashurst, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	31	0	50	39	23	15	8	13	6	14	4
2	31	36	0	25	36	17	19	10	15	4	32	9
3	31	26	0	0	39	20	16	10	12	2	32	9
4	27	27	0	0	39	13	11	8	15	2	13	7
5	21	26	0	30	36	10	15	10	47	2	9	7
6	17	29	0	61	39	10	13	8	5	2	4	4
7	18	34	0	52	36	17	16	11	4	4	0	4
8	17	31	0	50	37	9	20	10	4	8	0	5
9	39	31	0	50	36	15	19	8	4	15	0	20
10	36	32	0	48	32	14	19	6	4	14	15	55
11	23	31	0	50	31	18	22	11	4	7	6	55
12	17	27	0	50	26	23	19	12	4	4	0	15
13	18	26	0	50	31	18	19	11	4	4	0	7
14	18	34	0	48	39	18	15	11	11	2	1	7
15	34	32	0	50	36	17	16	11	7	4	43	4
16	18	26	0	50	32	17	16	10	6	4	52	4
17	13	26	36	48	31	15	16	8	4	2	20	4
18	21	23	43	48	26	17	16	8	4	4	6	4
19	18	26	50	50	26	23	15	8	4	4	65	4
20	15	26	50	50	29	14	13	8	4	7	63	2
21	13	29	46	48	32	18	11	7	4	9	37	4
22	12	31	50	50	29	23	.2	7	4	9	26	4
23	13	31	46	50	32	20	11	7	2	10	23	8
24	13	26	50	46	26	17	12	8	2	14	10	4
25	20	26	54	39	29	17	13	8	2	17	0	4
26	17	12	55	37	29	17	11	8	5	17	0	4
27	18	0	54	36	29	17	13	8	8	12	0	4
28	21	0	54	34	23	17	13	11	17	12	0	2
29	26	0	52	32	------	17	11	13	9	10	16	2
30	26	0	52	36	------	14	11	13	4	12	13	2
31	32	------	50	32	------	20	------	13	------	14	17	------

Monthly discharge of Fort Thomas Consolidated Canal at Ashurst, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	39	12	21.8	1,340
November	36	0	24.5	1,460
December	55	0	23.9	1,470
January	61	0	41.9	2,580
February	39	23	32.3	1,790
March	23	9	16.9	1,040
April	22	11	14.9	887
May	13	6	9.4	578
June	47	2	7.7	458
July	15	2	7.6	467
August	65	0	16.7	1,030
September	55	2	8.9	530
The year	65	0	18.8	13,600

SAN PEDRO RIVER NEAR FAIRBANK, ARIZ.

LOCATION.—In T. 20 S., R. 21 E., unsurveyed, on old Spanish grant at ranch house of Boquillas Land & Cattle Co., 1½ miles south of Fairbank, Cochise County, and 4 miles below Charleston dam site.

DRAINAGE AREA.—1,300 square miles (measured on topographic maps and Greenidge map of Sonora, Mex.).

RECORDS AVAILABLE.—September 28, 1912, to September 30, 1922. January 27, 1904, to August 31, 1906, and October 8, 1910, to November 15, 1911, for a station at Charleston; November 15, 1911, to September 28, 1912, for station at diversion dam of Boquillas Land & Cattle Co.

GAGE.—Vertical and inclined staff on right bank just upstream from ford leading to ranch house; read by A. H. Zachau.

DISCHARGE MEASUREMENTS.—Made from cable 600 feet downstream from gage or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifting. Banks high and steep, channel fairly straight with considerable fall. At low stages channel bears away from gage, and a ditch has to be maintained from gage to river. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.2 feet at 8 a. m. August 10 (discharge, 3,380 second-feet); minimum stage, 9.1 feet May 18–23 (discharge, 1 second-foot).

1912–1922: Maximum stage recorded, 26 feet, present datum, at 5 p. m. December 22, 1915 (discharge not determined); minimum discharge, 1 second-foot June 13–14, September 26–28, 1918, June 23–30, 1919, and April 29, May 18–23, 1922.

DIVERSIONS.—Boquillas Land & Cattle Co., diverts at a dam a mile above station for irrigation. Total area irrigated not known.

ACCURACY.—Stage-discharge relation not permanent. Rating curves well defined except for discharge above 2,000 second-feet. Gage read to hundredths once a day and oftener during flood periods. Daily discharge ascertained by applying mean daily gage height to rating table. Shifting-control method used January 7 to March 13 and May 4 to June 13. Records fair.

Discharge measurements of San Pedro River near Fairbank, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 2	J. H. Gardiner	9.25	12	July 31	H. C. Schwalen	10.38	277
Mar. 13	do	9.34	8	Aug. 6	J. H. Gardiner	9.30	14.4
June 13	do	9.05	2.2	Sept. 28	do	9.25	2.7
29	H. C. Schwalen	9.55	39.6				

Daily discharge, in second-feet, of San Pedro River near Fairbank, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	8	11	14	11	8	14	3.5	2	18	420	203
2	14	8	11	14	11	8	10	6	2	14	55	73
3	14	8	14	14	11	7	6	6	3	14	28	335
4	18	8	18	18	11	7	6	4	3	14	14	28
5	18	8	18	18	11	7	6	4	3	11	14	510
6	18	8	18	23	11	7	6	2	3	1,770	14	545
7	34	14	18	18	11	7	6	4	3	650	14	73
8	18	14	18	18	11	7	6	4	3	138	985	73
9	14	14	23	18	7	7	6	4	3	168	186	1,640
10	11	14	23	14	7	7	6	4	3	63	1,900	70
11	11	14	23	14	10	7	6	7	3	47	223	35
12	11	14	18	14	10	8	6	2	3	23	63	30
13	8	14	18	14	13	9	3.5	2	2	23	55	30
14	8	14	18	14	13	10	3.5	2	2.5	23	168	30
15	8	14	14	14	13	14	3.5	2	2.5	23	63	24
16	8	14	14	14	10	14	3.5	2	2.5	18	138	24
17	8	14	11	14	13	14	3.5	2	4	580	40	19
18	8	14	11	13	13	10	6	1	4	14	186	30
19	8	14	11	10	13	6	6	1	4	168	63	19
20	8	14	11	10	11	10	6	1	4	223	40	19

Daily discharge, in second-feet, of San Pedro River near Fairbank, Ariz., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	8	14	14	13	11	14	6	1	4	47	108	19
22	8	11	14	13	10	10	3.5	1	4	40	63	19
23	8	11	14	10	8	6	3.5	1	4	28	266	14
24	8	11	14	13	8	6	3.5	6	4	168	83	14
25	8	11	14	13	8	10	3.5	6	4	203	47	14
26	8	11	14	13	11	6	3.5	6	4	420	34	6
27	8	11	14	13	8	10	6	6	4	243	28	6
28	8	11	14	13	8	14	6	6	153	96	23	6
29	8	11	14	11	-------	10	1	6	40	83	23	6
30	8	11	14	11	-------	10	3.5	6	23	108	18	6
31	8	-------	14	14	-------	10	-------	3	-------	895	18	-------

Monthly discharge of San Pedro River near Fairbank, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	34	8	11.3	695
November	14	8	11.9	708
December	23	11	15.3	941
January	23	10	14.1	867
February	13	7	10.5	583
March	14	6	9.0	553
April	14	1	5.32	317
May	7	1	3.60	221
June	153	2.5	10.1	601
July	1,770	11	204	12,500
August	1,900	14	174	10,700
September	1,640	6	131	7,800
The year	1,900	1	50.4	36,500

SANTA CRUZ RIVER NEAR NOGALES, ARIZ.

LOCATION.—In sec. 36, T. 23 S., R. 14 E., at city of Nogales pumping plant, 7 miles northeast of Nogales, Santa Cruz County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 28, 1921, to June 30, 1922, when station was discontinued. March 22 to November 30, 1907, and April 1, 1909, to September 30, 1920; fragmentary.

GAGE.—Painted on vertical pier of highway bridge. One gage to each pier designated A, B, and C, from left to right bank; read by O. R. Harrington. For description of previous gages used at this station, see Water-Supply Paper 479, page 157.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge at gage.

CHANNEL AND CONTROL.—Bed composed of sand and gravel which is constantly shifting. Channel is wide and shallow with low banks. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage for period, 5.6 feet at 5 p. m. June 27 (discharge, 86 second-feet); dry for numerous periods.

1921–1922: Maximum stage, 8.3 feet at 6 p. m. August 9, 1921 (discharge, 2,600 second-feet); channel usually dry during long periods of each year.

DIVERSIONS.—Water is diverted above station for irrigation of about 140 acres.

ACCURACY.—Stage-discharge relation continually changing. Standard rating curve fairly well defined. Staff gage read twice a day to half-tenths. Daily discharge ascertained by applying mean daily gage height to rating tables. Shifting-control method used January 3 to February 22. Records fair.

Discharge measurements of Santa Cruz River near Nogales, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Dec. 1	J. H. Gardiner	5.10	10.0	Feb. 22	R. C. Rice	5.12	7.5
2	do	5.13	11	Mar. 14	J. H. Gardiner	5.15	10
Jan. 2	R. C. Rice	5.14	11				

Daily discharge, in second-feet, of Santa Cruz River near Nogales, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	June
1	17	10	17	7.5	16	7		
2	14	7.5	17	14	11	4.5	7	
3	14	10	10	22	11	2	7	
4	17	7.5	7.5	27	11	4.5	4.5	
5	17	7.5	10	27	8	4.5	2	
6	14	7.5	17	16	8	4.5		
7	10	5	17	16	8	4.5		
8	10	5	17	12	8	2		
9	10	5	17	27	8	2.2		
10	10	5	17	16	8			
11	10	5	17	16	8			
12	5	5	17	12	5	4.5		
13	10	5	14	12	5	19		
14	10	10	14	9	5	14		
15	10	10	14	12	8	7		
16	10	10	10	12	8	7		
17	5	7.5	10	9	5	7		
18	10	7.5	10	16	5	10.5		
19	10	7.5	7.5	16	5	7		
20	10	10	10	16	5	7		
21	5	10	10	22	8	7		
22	5	5	10	16	14	4.5		
23	5	5	14	16	14	2		
24	10	10	10	16	14	14		
25	10	10	14	16	14	14		
26	10	10	10	16	7	14		
27	10	10	10	16	7	7		43
28	14	10	10	16	7	7		7
29	14	14	10	16		7		
30	14	17	14	16		2		
31	10		7.5	20				

NOTE.—Stream dry on days for which no discharge is given.

Monthly discharge of Santa Cruz River near Nogales, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	17	5	10.6	652
November	17	5	8.28	493
December	17	7.5	12.6	775
January	27	7.5	16.1	990
February	16	5	8.6	478
March	19	0	6.36	391
April	7	0	.68	40
June	43	0	1.7	101
The period				3,920

SANTA CRUZ RIVER AT TUCSON, ARIZ.

LOCATION.—In sec. 14, T. 14 S., R. 13 E., at Congress Street Bridge at Tucson, Pima County, 7 miles above Rillito Creek.

DRAINAGE AREA.—2,260 square miles (measured on topographic maps and Greenidge maps of Sonora, Mex.).

RECORDS AVAILABLE.—October 15, 1905, to September 30, 1922.

GAGE.—Staff gages painted on downstream side of each bridge abutment; read by J. O. Kenny.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand; channel wide and shallow. Control shifts badly at all stages.

EXTREMES OF DISCHARGE.—Maximum discharge during year, 2,000 second-feet about 11 p. m. July 20; river dry most of time.

1905–1922: Maximum stage recorded, 9.8 feet December 24, 1914 (discharge, about 9,000 second-feet); river dry most of each year at this point.

DIVERSIONS.—Diversions above station for irrigation; amounts unknown.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curves poorly defined. Gage read to tenths several times a day during periods of flow. Daily discharge ascertained from discharge hydrographs prepared from discharge determined by applying each gage reading to rating table. Records fair.

COOPERATION.—Records furnished by University of Arizona, Professor G. E. P. Smith, irrigation engineer.

Discharge measurements of Santa Cruz River at Tuscon, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
July 7	Code and Rice	4.52	165	July 27	W. E. Code	4.60	32
18	Code and Schwalen	5.42	664	31	do	5.73	1,010
18	H. C. Schwalen	4.08	160	Aug. 15	H. C. Schwalen	4.98	260
21	W. E. Code	4.40	79	16	Schwalen and Code	5.52	502
26	Schwalen and Code	4.95	400	Sept. 11	W. E. Code	4.38	18

Daily discharge, in second-feet, of Santa Cruz River at Tuscon, Ariz., for the year ending September 30, 1922

Day	Jan.	July	Aug.	Sept.	Day	Jan.	July	Aug.	Sept.
1	10		35		16	7	20	380	
2	10				17	7		450	
3	10				18	7	255	180	15
4	10				19	7	5	30	
5	10			180	20	6	290	5	
6	9			200	21	6	310	5	
7	9	55			22	6	2	340	
8	9	4			23	6		590	
9	9	15			24	5	1	5	
10	9	4	220		25	5			
11	8		30	40	26	4	400		
12	8		10		27	3	30		
13	8		70		28	2			
14	8		250		29	1			
15	8		180		30	1	25		
					31	1	630		

NOTE.—Stream reported dry on days of no record.

Monthly discharge of Santa Cruz River at Tucson, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January	10	1	6.7	412
July	630	0	66.0	4,060
August	590	0	89.7	5,520
September	200	0	14.5	863
The year	630	0	15.0	10,900

NOTE.—Monthly discharge computed by engineer of U. S. Geol. Survey from daily discharge furnished by University of Arizona, G. E. P. Smith, irrigation engineer.

RILLITO CREEK NEAR TUCSON, ARIZ.

LOCATION.—In sec. 23, T. 13 S., R. 13 E., at highway bridge on Oracle road, 4 miles above confluence with Santa Cruz River and 4 miles north of Tucson, Pima County.

DRAINAGE AREA.—897 square miles (measured on topographic maps).

RECORDS AVAILABLE.—January 12, 1911, to September 30, 1922; fragmentary.

GAGE.—Staff gages painted on downstream side of several bridge piers, set to same datum; read by Morgan Mason.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand which is constantly shifting. Control not well defined.

EXTREMES OF DISCHARGE.—Maximum discharge during year, 3,250 second-feet during night of August 9–10; dry greater part of year.

1911–1922: Maximum stage occurred December 23, 1914 (discharge greater than 16,000 second-feet); dry greater part of each year.

DIVERSIONS.—Flood water is diverted for irrigation above station; amount unknown.

REGULATION.—None.

ACCURACY.—Stage-discharge relation continually changing. Rating curves poorly defined. Gage read to tenths several times a day during periods of flow. Daily discharge ascertained from discharge hydrographs prepared from discharge determined by applying each gage reading to rating table. Records fair.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer.

Discharge measurements of Rillito Creek near Tucson, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Jan. 3	W. E. Code	4.18	94.0	Aug. 10	W. E. Code	3.42	34.8
4	do	3.67	8.4	16	Code and Schwalen	3.36	11.
July 19	do	3.40	4.0	18	H. C. Schwalen	4.75	316

Daily discharge, in second-feet, of Rillito Creek near Tucson, Ariz., for the year ending September 30, 1922

Day	Oct.	Jan.	June	July	Aug.	Sept.	Day	Oct.	Jan.	June	July	Aug.	Sept.
1	5				2		16					18	
2							17					20	
3		65					18				5	250	
4		11					19				6	1	
5		41					20						
6							21					6	
7							22					310	
8	4			45			23						
9				24	260	300	24						
10					75		25			18	4		
11							26			35	5		
12							27						
13							28						
14							29						
15							30						
							31				16		

NOTE.—Stream dry on days for which no discharge is given.

Monthly discharge of Rillito Creek near Tucson, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	5	0	0.3	18
January	65	0	3.8	234
June	35	0	1.8	105
July	45	0	3.4	209
August	310	0	30.4	1,870
September	300	0	10	595
The year	300	0	4.2	3,030

SALT RIVER NEAR ROOSEVELT, ARIZ.

LOCATION.—At site of former diversion dam for power canal, 10 miles above upper end of Roosevelt reservoir and 20 miles east of Roosevelt, Gila County.

DRAINAGE AREA.—4,222 square miles (measured by United States Bureau of Reclamation).

RECORDS AVAILABLE.—October 1, 1913, to September 30, 1922 (including all water diverted for the development of power but not flow of Tonto Creek); February 7, 1901, to December 9, 1907, at site of Roosevelt dam (including flow of Tonto Creek).

1910–1913: Discharge at Roosevelt dam computed from records of flow into and out of the reservoir (representing natural flow of Salt River, including Tonto Creek and water diverted for the development of power).

GAGE.—Principal gage is vertical staff on left bank, bolted to concrete wall at head of canal. Temporary gages are used from time to time on account of channel shifting away from main gage.

DISCHARGE MEASUREMENTS.—Made from cable at dam site or by wading near dam site. Prior to January 19, 1916, when dam was destroyed by flood, low-water measurements were made by wading below dam. Above wading stage discharge was determined from elevation of water surface in reservoir taking into account known outflow and computed inflow from other sources besides Salt River.

CHANNEL AND CONTROL.—Shifting sand and gravel. Prior to its destruction by flood on January 19, 1916, dam formed a permanent control.

EXTREMES OF DISCHARGE.—Maximum stage reported during year, 9.0 feet March 17 (discharge, 16,500 second-feet); minimum stage, 2.95 feet September 29 and 30 (discharge, 205 second-feet).

1913–1922: Maximum mean daily discharge, 79,200 second-feet January 15, 1916; minimum discharge, 152 second-feet September 25, 1918, and July 4, 1921.

DIVERSIONS.—None of importance.

REGULATION.—None.

ACCURACY.—Discharge measurements are made nearly every day when discharge is less than about 3,000 second-feet, and results should be excellent. For flow greater than 3,000 second-feet there are no facilities for making discharge measurements. Discharge determined from extension of rating curve and study of reservoir contents.

COOPERATION.—Daily-discharge records furnished by Salt River Valley Water Users' Association.

Daily discharge, in second-feet, of Salt River near Roosevelt, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	269	270	473	1,580	750	1,860	1,560	548	438	528	268
2	406	256	252	410	545	700	1,910	1,520	535	348	870	325
3	362	246	245	540	545	675	2,250	1,460	520	320	412	300
4	376	240	254	4,600	369	542	3,320	1,330	552	282	288	268
5	362	240	252	1,880	356	512	3,500	1,250	508	275	274	250
6	336	232	254	1,000	342	500	2,300	1,190	488	257	252	242
7	310	230	247	790	308	550	2,520	1,160	476	240	243	244
8	313	230	254	652	323	542	2,120	1,140	448	247	209	240
9	284	223	274	602	1,630	538	1,780	1,080	442	240	240	250
10	280	223	242	542	2,610	522	1,600	1,060	432	238	284	240
11	300	223	251	524	2,820	505	1,640	1,060	380	244	524	235
12	296	223	251	449	2,850	518	1,450	1,040	372	234	428	236
13	293	223	251	408	1,560	569	1,400	990	370	230	362	230
14	293	223	266	366	1,380	565	1,400	942	364	238	312	230
15	283	223	258	344	1,000	535	1,400	865	355	228	425	268
16	277	229	258	295	810	582	1,600	835	348	225	925	241
17	277	240	268	325	700	8,660	1,700	726	340	225	545	278
18	275	250	250	295	698	9,380	1,630	720	304	332	835	250
19	274	260	260	295	700	4,400	1,520	730	297	260	568	227
20	272	247	246	298	775	3,850	1,550	726	285	393	1,060	220
21	270	255	232	336	862	2,900	1,450	705	268	362	712	288
22	270	227	258	320	1,050	2,250	1,580	690	265	453	572	255
23	270	240	402	298	1,120	2,420	1,880	695	258	365	512	252
24	270	246	608	288	950	2,550	2,300	688	246	280	758	260
25	331	247	410	285	862	2,750	2,200	670	292	256	548	235
26	384	250	320	285	875	2,400	2,300	611	298	374	510	225
27	477	250	458	285	775	2,300	2,100	640	330	855	500	222
28	384	265	535	291	755	2,400	1,800	598	388	678	435	211
29	362	272	516	287	-------	2,400	1,720	590	480	452	390	205
30	355	322	522	282	-------	2,200	1,560	670	488	344	378	205
31	320	-------	482	298	-------	1,860	-------	560	-------	332	342	-------

Monthly discharge of Salt River near Roosevelt, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	477	270	320	19,700
November	322	223	243	14,500
December	608	232	318	19,600
January	4,600	282	592	36,400
February	2,850	308	1,040	57,800
March	9,380	500	1,990	122,000
April	3,500	1,400	1,910	114,000
May	1,560	560	919	56,500
June	548	246	389	23,100
July	855	225	330	20,300
August	1,060	209	492	30,300
September	325	205	247	14,700
The year	9,380	205	731	529,000

NORTH FORK OF WHITE RIVER AT WHITERIVER, ARIZ.

LOCATION.—At power plant half a mile from Fort Apache Indian School at Whiteriver, Navajo County, 2½ miles above junction of north and east forks of White River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1916, to June 30, 1922, when station was discontinued. Record fragmentary.

GAGE.—Inclined and vertical staff on right bank 140 feet below tailrace of power plant; read by Chester Gatewood.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifts during high water. Control is gravel and boulders.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 4.8 feet at 6.15 a. m. April 24 (discharge, 1,120 second-feet); minimum discharge, 35 second-feet, December 4 and 5.

1916–1922: Maximum stage recorded, 7 feet during February, 1920 (discharge not determined); minimum discharge, 10 second-feet June 22 and 27, 1921.

ICE.—Stage-discharge relation probably not seriously affected by ice.

DIVERSIONS.—Water diverted for development of power and returned to river above gage.

REGULATION.—Slight fluctuation may occasionally be caused by operation of power plant just above gage.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curves poorly defined. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records fair.

Discharge measurements of North Fork of White River at Whiteriver, Ariz., during the year ending September 30, 1922

[Made by J. H. Gardiner]

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 19	2.91	30	May 3	4.08	442
20	3.05	50	4	4.08	441

Daily discharge, in second-feet, of North Fork of White River at Whiteriver, Ariz., for the period October 1, 1921, to June 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	85	65	55	75	55	120	455	495	192
2	75	65	65	96	55	96	455	455	175
3	85	65	45	65	55	96	570	425	175
4	55	65	35	75	55	120	570	395	162
5	55	55	35	75	55	120	610	395	148
6	55	55	65	75	55	120	455	395	148
7	55	55	55	85	55	108	395	395	148
8	55	55	45	65	55	120	368	395	134
9	55	55	45	75	120	96	340	368	134
10	65	55	55	75	290	120	270	368	55
11	65	55	65	75	175	120	340	315	120
12	75	55	55	55	175	120	315	290	120
13	75	55	55	55	395	120	340	250	108
14	75	55	55	55	162	108	340	250	96
15	75	65	65	55	120	162	425	250	96
16	65	65	55	55	148	175	495	270	85
17	65	55	45	55	148	455	425	270	85
18	65	65	55	75	162	250	395	290	85
19	65	45	55	65	530	250	395	290	85
20	65	55	55	65	192	250	455	290	75
21	55	65	55	65	192	250	530	270	75
22	55	75	55	55	162	340	610	250	75
23	55	65	65	55	148	395	790	250	85
24	85	75	45	55	148	455	838	250	96
25	96	65	55	55	148	340	838	230	96
26	75	65	65	55	148	395	790	230	108
27	75	55	120	55	148	495	610	230	96
28	75	65	85	55	120	455	530	210	96
29	75	65	85	55	-------	425	530	210	96
30	65	55	75	65	-------	425	530	210	85
31	65	-------	85	55	-------	425	-------	192	-------

Monthly discharge of North Fork of White River at Whiteriver, Ariz., for the period October 1, 1921, to June 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	96	55	67.9	4,180
November	75	45	60.3	3,590
December	120	35	59.7	3,670
January	96	55	64.4	3,960
February	530	55	152	8,440
March	455	96	243	14,900
April	838	270	500	29,800
May	495	192	303	18,600
June	192	55	111	6,600
The period	-------	-------	-------	93,700

WHITE RIVER AT FORT APACHE, ARIZ.

LOCATION.—At highway bridge on Fort Apache Military Reservation, half a mile below junction of North and East forks, at Fort Apache, Navajo County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 1, 1921, to June 30, 1922, when station was discontinued. October 23, 1912, to September 30, 1920. Records fragmentary.

GAGE.—Vertical and inclined staff fastened to downstream end of left abutment of bridge; installed June 6, 1921; read by George Bond and Jesse Palmer. For previous gages see Water-Supply Paper 479.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel with gravel riffle. Control frequently shifts during high water. Left bank subject to overflow during extreme high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 2.86 feet at 6 p. m. April 26 (discharge, 640 second-feet); minimum stage, 1.5 feet 4 p. m. December 4 (discharge, 50 second-feet).

1912–1922: Records incomplete, maximum discharge not determined. Minimum discharge of 25 second-feet occurred on November 3 and 4, 1915.

DIVERSIONS.—Small quantity of water diverted for irrigation by Indians several miles above station; amount not known.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curves poorly defined. Gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records poor.

Discharge measurements of White River at Fort Apache, Ariz., during the year ending September 30, 1922

[Made by J. H. Gardiner]

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 19	1.52	40	May 3	2.74	522
20	1.64	68	3	2.70	495

Daily discharge, in second-feet, of White River at Fort Apache, Ariz., for the period October 1, 1921, to June 20, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	120	90	80	100	70	135	470		330
2	135	80	80	135	70	100	470		305
3	122	80	80	150	70	122	580		305
4	110	80	50	100	70	135	580	500	280
5	100	80	60	90	70	150	630		258
6	100	80	90	90	70	110	500		218
7	100	80	80	90	70	150	440	410	218
8	100	80	70	100	90	122	380	380	182
9	100	80	60	100	135	100	380	410	200
10	100	80	60	90	235	150	330	380	182
11	90	80	80	80	200	135	330	410	182
12	90	80	80	60	200	135	355	380	150
13	90	80	80	70	165	135	380	355	135
14	90	80	70	70	165	110	355	380	150
15	90	80	80	70	135	165	410	355	135
16	90	80	80	70	165	200	470	355	122
17	90	80	50	90	165	500	440	380	110
18	90	80	70	90	182	330	380	355	110
19	90	60	80	90	200	258	380	380	100
20	80	70	70	90	218	280	440	380	100
21	80	80	70	70	235	330	500	380	100
22	80	80	80	70	200	380	580	355	100
23	80	80	80	70	182	330	580	380	110
24	122	80	60	70	165	470	630	330	110
25	122	80	70	90	182	380	630	330	110
26	110	80	100	70	165	440	580	330	135
27	100	80	240	70	165	470	580	355	150
28	90	80	150	70	150	470	540	330	150
29	90	80	122	70	------	440	540	305	135
30	90	80	110	80	------	440	540	280	122
31	90	------	110	90	------	440	------	330	------

Monthly discharge of White River at Fort Apache, Ariz., for the period October 1 1921, to June 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	135	80	97.8	6,010
November	90	60	79.3	4,720
December	240	50	85.2	5,240
January	150	70	85.0	5,230
February	235	70	150	8,330
March	500	100	262	16,100
April	630	330	480	28,600
May		280	388	23,900
June	330	100	166	9,880
The period				108,000

TONTO CREEK NEAR ROOSEVELT, ARIZ.

LOCATION.—In sec. 14, T. 6 N., R. 10 E., 6 miles above upper end of Roosevelt reservoir and 15 miles northwest of Roosevelt, Gila County.

DRAINAGE AREA.—1,004 square miles (measured by United States Bureau of Reclamation).

RECORDS AVAILABLE.—October 1, 1913, to September 30, 1922.

GAGE.—Vertical staff on right bank. Site of gage is changed from time to time owing to shifting control.

DISCHARGE MEASUREMENTS.—Made by wading at low stages and by slope method at high stages.

CHANNEL AND CONTROL.—Bed composed of boulders and gravel; banks well defined. Control shifts at high stages.

EXTREMES OF DISCHARGE.—Maximum discharge during year, 10,000 second-feet, March 17; minimum mean daily discharge, 5 second-feet, July 15–20.

1913–1922: Maximum mean daily discharge, 15,800 second-feet, January 19, 1916; minimum discharge, 1 second-foot, parts of September and October, 1918, and June and July, 1921.

DIVERSIONS.—None of importance. Entire flow is discharged into Roosevelt reservoir.

REGULATION.—None.

ACCURACY.—Discharge measurements made as often as appears necessary to determine changes in stage-discharge relation. Records for high stages based on extension of rating curves and study of contents of Roosevelt reservoir.

COOPERATION.—Records of daily discharge furnished by Salt River Valley Water Users' Association.

Daily discharge, in second-feet, of Tonto Creek near Roosevelt, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	18	30	250	1,500	304	290	115	20	15	700	7
2	125	18	26	178	476	300	270	102	20	12	143	7
3	87	18	26	300	460	290	350	102	20	9	55	8
4	36	18	20	3,000	330	275	400	85	20	9	20	8
5	36	18	18	1,820	330	260	360	85	20	8	35	8
6	25	18	20	700	275	140	360	72	12	8	22	7
7	25	18	20	490	290	130	330	62	10	8	10	7
8	22	18	26	390	315	130	300	65	8	7	10	7
9	22	18	16	325	2,360	115	330	58	14	7	7	26
10	18	14	18	380	3,400	115	330	115	13	7	7	10

Daily discharge, in second-feet, of Tonto Creek near Roosevelt, Ariz., for the year ending September 30, 1922—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
11	18	14	18	325	1,680	100	275	230	13	7	20	8
12	11	14	18	350	1,400	130	240	148	12	6	38	7
13	11	14	15	310	1,000	160	240	130	12	6	45	7
14	11	14	16	290	615	175	182	130	10	6	55	7
15	11	14	15	153	540	220	165	130	7	5	36	9
16	11	14	15	130	470	340	165	115	7	5	30	10
17	11	14	15	130	350	6,000	165	100	10	5	25	12
18	11	14	15	120	300	5,000	165	85	10	5	25	10
19	11	14	15	88	300	3,000	150	75	10	5	85	8
20	11	18	15	88	300	3,000	150	62	10	5	76	8
21	11	18	15	85	350	1,250	150	50	10	6	51	8
22	8	18	15	83	390	1,250	165	45	6	8	49	42
23	8	18	32	50	400	1,090	165	40	6	6	40	18
24	32	18	26	50	385	1,020	165	35	6	6	36	12
25	130	18	26	40	365	1,090	165	33	6	7	30	14
26	68	18	32	40	350	960	165	30	6	230	26	14
27	50	18	2,200	30	335	900	150	36	6	790	22	12
28	32	18	775	30	325	870	130	25	56	145	16	12
29	30	18	380	30	-------	680	130	25	40	55	12	10
30	26	18	274	20	-------	630	130	25	18	20	8	10
31	20	-------	262	960	-------	1,860	-------	20	-------	56	8	-------

Monthly discharge of Tonto Creek near Roosevelt, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	130	8	30.4	1,870
November	18	14	16.7	994
December	2,200	15	142	8,730
January	3,000	20	362	22,300
February	3,400	275	700	38,900
March	6,000	100	1,030	63,300
April	400	130	224	13,300
May	230	20	78.4	4,820
June	56	6	13.9	827
July	790	5	47.5	2,920
August	700	7	56.2	3,460
September	42	7	11.1	660
The year	6,000	5	224	162,000

VERDE RIVER NEAR McDOWELL, ARIZ.

LOCATION.—At dam site on Salt River Indian Reservation, three-quarters of a mile above junction with Salt River and 5½ miles below McDowell, Maricopa County.

DRAINAGE AREA.—6,000 square miles (furnished by United States Bureau of Reclamation).

RECORDS AVAILABLE.—August 14 to September 30, 1889; April 20, 1897, to November 11, 1899; January 1, 1901, to April 19, 1902; July 23–26, 1902; January 1, 1903, to September 30, 1922.

GAGE.—Painted on granite rocks on right bank.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading. Since November, 1913, measurements have been made regularly three or four times a week by a resident hydrographer.

CHANNEL AND CONTROL.—Bed composed of sand; shifting.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge during year, 21,800 second-feet, January 4; minimum mean daily discharge, 120 second-feet, June 24 and 25.

1897–1922: Maximum mean daily discharge, 61,500 second-feet, November 27, 1905; minimum mean daily discharge, 32 second-feet, July 19 and 20, 1904.

DIVERSIONS.—Water is diverted 5 miles above station for use on Indian reservation.

COOPERATION.—Daily discharge record furnished by Salt River Valley Water Users' Association.

Daily discharge, in second-feet, of Verde River near McDowell, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	202	290	291	1,980	3,690	1,110	2,600	332	171	270	660	262
2	330	290	297	1,510	1,740	1,040	2,250	332	171	248	562	290
3	812	273	288	20,200	1,280	915	2,000	320	166	240	450	335
4	1,100	297	285	21,800	1,100	680	1,692	301	166	215	368	316
5	1,560	293	282	8,800	842	680	1,720	298	166	.180	320	370
6	947	289	277	4,500	742	602	2,000	283	166	152	295	354
7	713	284	282	3,080	698	602	2,050	280	160	147	270	320
8	548	283	289	2,500	726	660	1,780	265	155	206	252	336
9	486	288	286	1,720	1,880	662	1,380	241	155	208	222	340
10	394	294	289	1,470	3,320	655	1,260	264	155	173	232	293
11	344	289	292	1,270	9,080	608	1,160	314	155	173	338	287
12	330	291	302	1,110	12,200	560	1,160	316	155	145	356	216
13	300	290	284	975	7,880	600	900	316	155	164	281	261
14	275	287	288	922	4,240	645	965	315	148	137	258	252
15	268	282	289	795	3,240	672	912	297	145	129	255	235
16	265	277	286	686	2,500	858	825	294	148	133	264	206
17	256	291	282	556	1,830	9,020	735	294	148	127	238	190
18	250	291	280	543	1,430	17,800	666	281	150	168	295	176
19	242	292	279	500	1,420	9,150	760	256	150	177	366	174
20	242	291	284	460	2,670	6,650	678	247	138	154	282	205
21	239	288	287	432	2,750	5,650	608	235	128	134	295	198
22	233	280	292	418	2,620	5,050	543	215	125	160	320	185
23	230	288	319	411	2,510	4,500	498	200	125	203	404	175
24	227	292	338	393	1,850	4,270	442	174	120	364	504	185
25	389	293	482	407	1,400	4,080	453	176	120	298	420	178
26	483	285	574	397	1,220	4,720	445	190	125	234	355	180
27	491	287	1,540	397	1,060	4,580	452	190	172	209	318	152
28	446	288	15,400	374	1,060	4,350	426	190	230	285	318	152
29	385	282	11,400	360	-------	4,160	383	190	277	415	285	196
30	360	291	5,240	365	-------	3,460	365	174	338	330	275	178
31	360	-------	2,940	1,090	-------	2,660	-------	171	-------	287	255	-------

Monthly discharge of Verde River near McDowell, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,560	202	442	27,200
November	297	273	288	17,100
December	15,400	277	1,440	88,500
January	21,800	360	2,590	159,000
February	12,200	698	2,750	153,000
March	17,800	560	3,280	202,000
April	2,600	365	1,070	63,700
May	332	171	256	15,700
June	338	120	163	9,700
July	415	127	209	12,900
August	660	222	333	20,500
September	370	152	240	14,300
The year	21,800	120	1,080	784,000

AGUA FRIA RIVER NEAR GLENDALE, ARIZ.

LOCATION.—In sec. 28, T. 6 N., R. 1 E., at uncompleted masonry diversion dam of Beardsley irrigation project at Camp Dyer, 4 miles below mouth of Castle Creek and 22 miles northwest of Glendale, Maricopa County.

DRAINAGE AREA.—1,420 square miles (measured on topographic map).

RECORDS AVAILABLE.—November 10, 1910, to September 30, 1922.

GAGE.—Staff gage fastened to damaged stilling well on right bank at upstream face of dam; read by Will Benson.

DISCHARGE MEASUREMENTS.—Made from cable about one-third of a mile below gage or by wading.

CHANNEL AND CONTROL.—Channel composed of gravel and shifting sand. Principal control is formed by unfinished part of masonry diversion dam and ledge on which it is built. This dam has a large gap or opening near right bank through which low and medium flow passes; a scour gate opening, 4 feet by 7½ feet, in the base near the left bank through which flow from left channel passes at higher stages, and another gap or opening near left bank that carries flow at still higher stages. At extreme high stages stream flows over entire broad crest of dam which is at elevation 28.2 feet on gage. Sand fills in and scours out of the crevices in the right gap of dam continually with each rise in the river. Stage-discharge relation, therefore, is not permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 29.2 feet at noon September 2; minimum stage, 2.4 feet September 27.

1910–1922: Maximum stage, 33 feet November 27, 1919. determined from floodmarks (discharge, about 105,000 second-feet); minimum discharge 0.6 second-foot September 24–26, 1919. No record of discharge since September 30, 1919.

DIVERSIONS.—Water is diverted above gage for irrigating two or three small ranches; amount not known.

ACCURACY.—Stage-discharge relation variable. Not enough discharge measurements were made to define rating. Gage read to hundredths twice a day. Daily discharge not determined. Gage-height record good.

COOPERATION.—Gage-height record furnished by Robert O. Beardsley.

Discharge measurements of Agua Fria River near Glendale, Ariz., during the year ending September 30, 1922

Date	Made by—	Gage height	Discharge	Date	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*			*Feet*	*Sec.-ft.*
Nov. 18	Rice and Leatherman	3.50	12	Jan. 13	R. C. Rice	4.04	120
18	do	3.50	12	Mar. 6	do	4.39	105
Dec. 10	R. R. Leatherman	3.51	14	22	do	5.50	503
29	Code and Leatherman	4.58	271	May 19	Rice and Dudley	3.81	19
Jan. 4	R. C. Rice	5.85	1,960	July 3	R. C. Rice	3.64	2.6

Daily gage height, in feet, of Agua Fria River near Glendale, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10.2	3.5	3.55	3.75	5.75	4.7	4.9	4.0	3.7	3.65	5.4	6.2
2	5.45	3.5	3.55	9.9	5.3	4.6	4.85	3.95	3.7	3.65	4.7	12.85
3	4.75	3.5	3.55	12.8	5.0	4.55	4.85	3.95	3.7	3.65	4.3	6.5
4	4.4	3.5	3.5	6.1	4.7	4.5	4.8	3.95	3.7	3.65	3.55	4.05
5	4.25	3.45	3.5	5.25	4.5	4.45	4.75	3.95	3.7	3.65	3.85	3.5
6	4.1	3.45	3.6	4.9	4.5	4.4	4.75	3.9	3.7	3.65	3.8	7.1
7	4.0	3.45	3.55	4.6	4.45	4.3	4.7	3.9	3.7	3.65	3.75	3.45
8	3.95	3.45	3.6	4.45	5.3	4.3	4.7	3.9	3.65	3.65	3.8	3.0
9	3.9	3.5	3.55	4.4	7.4	4.25	4.65	3.85	3.65	3.65	3.8	2.9
10	3.85	3.5	3.5	4.25	6.95	4.25	4.6	3.95	3.65	3.65	4.0	2.8
11	3.8	3.5	3.5	4.1	6.35	4.2	4.55	4.05	3.65	3.65	3.8	2.75
12	3.8	3.5	3.5	4.1	5.4	4.4	4.5	4.1	3.65	3.65	4.4	2.7
13	3.8	3.5	3.5	4.05	5.5	4.8	4.4	4.0	3.65	3.6	4.4	2.7
14	3.8	3.5	3.5	4.0	5.55	4.7	4.4	3.95	3.65	3.6	4.1	2.7
15	3.75	3.5	3.5	3.9	5.3	4.9	4.3	3.9	3.6	3.6	3.9	2.65
16	3.75	3.5	3.5	3.85	5.2	5.25	4.3	3.85	3.6	3.65	3.85	2.6
17	3.75	3.5	3.45	3.8	5.05	7.7	4.25	3.85	3.6	4.0	3.95	2.55
18	3.75	3.5	3.5	3.8	5.3	6.95	4.2	3.8	3.6	3.85	4.55	2.5
19	3.75	3.5	3.5	3.75	4.9	7.1	4.15	3.8	3.6	4.05	4.6	2.5
20	3.7	3.5	3.5	3.7	4.9	5.5	4.15	3.8	3.6	3.8	4.45	2.45
21	3.75	3.55	3.5	3.65	4.9	5.2	4.15	3.75	3.6	4.1	4.75	2.45
22	3.7	3.55	3.6	3.6	5.05	5.5	4.1	3.75	3.6	4.0	4.2	2.6
23	3.65	3.55	4.1	3.55	5.1	5.5	4.1	3.75	3.6	3.8	5.7	2.5
24	3.65	3.55	3.95	3.55	5.0	5.3	4.1	3.75	3.6	3.75	4.6	2.5
25	3.9	3.55	3.85	3.55	4.9	5.4	4.1	3.75	3.7	3.65	4.15	2.45
26	3.7	3.55	5.85	3.5	4.85	5.3	4.1	3.75	4.0	3.65	3.85	2.45
27	3.65	3.5	6.7	3.5	4.8	5.2	4.05	3.75	3.85	5.5	4.15	2.4
28	3.65	3.5	5.35	3.5	4.75	5.1	4.05	3.7	3.75	4.1	4.1	2.9
29	3.65	3.55	4.5	3.5	-------	5.0	4.05	3.7	3.7	3.8	3.8	2.85
30	3.5	3.55	4.2	3.5	-------	4.95	4.0	3.7	3.65	3.7	3.75	2.45
31	3.5	-------	3.95	8.7	-------	4.95	-------	3.7	-------	3.65	3.75	-------

BARREN FLAT BASIN

WEST TURKEY CREEK NEAR LIGHT, ARIZ.

LOCATION.—In SW. ¼ sec. 17, T. 18 S., R. 29 E., at Sanders ranch, 2½ miles south and 9½ miles east of Light, Cochise County.

DRAINAGE AREA.—19 square miles (measured on topographic map).

RECORDS AVAILABLE.—July 30, 1919, to September 30, 1922.

GAGE.—Vertical enamel staff on right bank directly north of Sanders ranch; read by Sybil Sanders.

DISCHARGE MEASUREMENTS.—Measurements made by wading near gage.

CHANNEL AND CONTROL.—Low-water control 20 feet below gage, high-water control 100 feet below gage. Banks high, not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.0 feet August 14 (discharge, 48 second-feet); dry July 10–27, 31, August 1–8, and September 12–30.

1919–1922: Maximum mean daily discharge, 990 second-feet on July 31; 1921; dry at numerous times.

DIVERSIONS.—Minor diversions above and below station.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curve fairly well defined between zero and 30 second-feet. Gage read once a day to nearest two-hundredths and oftener during periods of flood. Daily discharge ascertained by applying daily gage height to rating table, and by hydrograph for flood periods. Records fair.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer.

Daily discharge, in second-feet, of West Turkey Creek near Light, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Sept.
1	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	-------	-------	0.5
2	.5	.5	.5	.5	.5	.5	2	.5	-------	-------	.5
3	.5	.5	.5	.5	.5	.5	2	.5	-------	-------	.5
4	.5	.5	.5	1.0	.5	.5	2	.5	-------	-------	.5
5	.5	.5	.5	1.0	.5	.5	2	-------	-------	-------	3.0
6	1.0	.5	.5	1.0	.5	.5	2	-------	-------	-------	2.0
7	1.0	.5	.5	1.0	.5	-------	2	-------	-------	-------	2.0
8	.5	.5	.5	1.0	.5	-------	2	-------	-------	-------	.5
9	.5	.5	.5	1.0	.5	-------	2	-------	-------	4	.5
10	.5	.5	.5	1.0	.5	-------	2	-------	-------	15	.5
11	.5	.5	.5	1.0	.5	-------	1	-------	-------	2	.5
12	.5	.5	.5	1.0	-------	-------	1	-------	-------	2	-------
13	.5	.5	.5	.5	-------	.5	1	-------	-------	2	-------
14	.5	.5	.5	.5	-------	.5	-------	-------	-------	18	-------
15	-------	.5	.5	.5	-------	.5	-------	-------	-------	17	-------
16	.5	.5	.5	.5	-------	.5	-------	-------	-------	11	-------
17	.5	.5	.5	.5	-------	.5	-------	-------	-------	5	-------
18	.5	.5	.5	.5	-------	.5	.5	-------	-------	5	-------
19	-------	.5	.5	.5	-------	.5	.5	-------	-------	5	-------
20	-------	.5	.5	.5	-------	.5	.5	-------	-------	11	-------
21	-------	.5	.5	.5	-------	.5	.5	-------	-------	11	-------
22	-------	.5	.5	.5	-------	.5	.5	-------	-------	5	-------
23	-------	.5	.5	.5	.5	.5	.5	-------	-------	3	-------
24	.5	.5	.5	.5	.5	1	.5	-------	-------	3	-------
25	.5	.5	.5	.5	.5	2	.5	-------	-------	2	-------
26	.5	.5	.5	.5	.5	2	.5	-------	-------	.5	-------
27	.5	.5	.5	.5	.5	2	.5	-------	-------	.5	-------
28	.5	.5	.5	.5	.5	2	.5	-------	0.5	.5	-------
29	.5	.5	.5	.5	-------	2	.5	-------	.5	.5	-------
30	.5	.5	.5	.5	-------	2	.5	-------	-------	.5	-------
31	.5	-------	.5	.5	-------	2	-------	-------	-------	.5	-------

NOTE.—Trace only on days for which no discharge is given, except July 10-26, 31, Aug. 1-8, and Sept. 12-30, when stream was dry.

Monthly discharge of West Turkey Creek near Light, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1.0	0.5	0.43	26
November	.5	.5	.5	30
December	.5	.5	.5	31
January	1	.5	.65	40
February	.5	T.	.30	17
March	2	.5	.76	47
April	2	.5	.98	58
May	.5	T.	.06	4
June	T.	T.	T.	T.
July	1	0	.03	2
August	18	0	4.0	246
September	3	0	.37	22
The year	18	0	.72	523

NOTE.—T. = Trace of water.

WHITEWATER BASIN

WHITEWATER DRAW NEAR RUCKER, ARIZ.

LOCATION.—In sec. 29, T. 19 S., R. 29 E., at Heyne ranch, 6 miles east of Rucker, Cochise County.

DRAINAGE AREA.—40 square miles (measured on topographic map).

RECORDS AVAILABLE.—August 7, 1919, to September 30, 1922.

GAGE.—Vertical enamel staff fastened to tree on left bank; read by F. W. Heyne.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet below gage or by wading.

CHANNEL AND CONTROL.—Channel composed of boulders, gravel, and bedrock, with pronounced drop 300 feet below gage. Channel fairly straight and fairly uniform in cross section.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge for year, 76 second-feet on August 10; minimum discharge, dry July 1–25.

1919–1922: Maximum mean daily discharge, 1,240 second-feet November 23, 1919; minimum discharge, dry August 1–12, 1920, and July 1–25, 1922.

DIVERSIONS.—Minor diversions above and below station.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curve fairly well defined between zero and 200 second-feet. Gage read once a day to nearest two-hundredths. Daily discharge ascertained by applying daily gage height to rating table. Records fair.

COOPERATION.—Records furnished by University of Arizona, Prof. G. E. P. Smith, irrigation engineer.

Discharge measurements of Whitewater Draw near Rucker, Ariz., during the year ending September 30, 1922

[Made by J. H. Gardiner]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
Dec. 7	0.72	0.42
Mar. 11	.70	.30

Daily discharge, in second-feet, of Whitewater Draw near Rucker, Ariz., for the year ending September 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Aug.	Sept.
1	2	0.5	0.5	0.5	1	0.5	0.5	1	-------	1
2	2	.5	.5	.5	1	.5	.5	1	-------	1
3	2	.5	.5	.5	1	.5	.5	1	-------	1
4	1	.5	.5	1	1	.5	.5	1	-------	1
5	1	.5	.5	1	1	.5	.5	1	-------	1
6	1	.5	.5	1	1	.5	.5	.5	-------	7
7	1	.5	.5	1	1	.5	.5	.5	-------	6
8	1	.5	.5	1	1	.5	.5	.5	6	4
9	1	.5	.5	1	1	.5	.5	.5	6	5
10	1	.5	.5	1	1	.5	.5	.5	76	6
11	1	.5	.5	1	1	.5	.5	.5	19	5
12	1	.5	.5	1	1	.5	.5	.5	8	3
13	1	.5	.5	1	1	.5	.5	.5	9	2
14	1	.5	.5	1	1	.5	.5	.5	28	2
15	1	.5	.5	1	1	.5	1	.5	16	2
16	1	.5	.5	1	.5	.5	1	-------	11	2
17	.5	.5	.5	1	.5	.5	1	-------	9	1
18	.5	.5	.5	1	.5	.5	1	-------	7	1
19	.5	.5	.5	1	.5	.5	1	-------	6	1
20	.5	.5	.5	1	.5	.5	1	-------	5	1
21	.5	.5	.5	1	.5	.5	1	-------	4	1
22	.5	.5	.5	1	.5	.5	1	-------	3	1
23	.5	.5	.5	1	.5	.5	1	-------	3	1
24	.5	.5	.5	1	.5	.5	1	-------	3	1
25	.5	.5	.5	1	.5	.5	2	-------	2	1
26	.5	.5	.5	1	.5	.5	2	-------	2	1
27	.5	.5	.5	1	.5	.5	2	-------	2	1
28	.5	.5	.5	1	.5	.5	1	-------	1	1
29	.5	.5	.5	1	-------	.5	1	-------	1	1
30	.5	.5	.5	1	-------	.5	1	-------	1	1
31	.5	-------	.5	1	-------	.5	-------	-------	1	-------

NOTE.—Trace only where no discharge is given, except July 1–25, when stream was dry.

Monthly discharge of Whitewater Draw near Rucker, Ariz., for the year ending September 30, 1922

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2	0.5	0.85	52
November	.5	.5	.50	30
December	.5	.5	.50	31
January	1	.5	.95	58
February	1	.5	.77	43
March	.5	.5	.50	31
April	2	.5	.86	51
May	1	T.	.32	20
June	T.	T.	T.	T.
July	T.	0	T.	T.
August	76	T.	7.39	454
September	7	1	2.10	124
The year	76	0	1.2	894

NOTE.—T. = Trace of water only.

WHITEWATER DRAW NEAR DOUGLAS, ARIZ.

LOCATION.—In sec. 10, T. 24 S., R. 27 E., opposite city pumping plant, a quarter of a mile above highway and El Paso & Southwestern Railroad bridges, 1 mile above electric railway bridge, and 1¼ miles west of Douglas, Cochise County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 16, 1916, to April 30, 1922, when station was discontinued. Records were obtained August 24 to October 10, 1911, at electric railway bridge; July 21, 1912, to February 15, 1916, at highway bridge.

GAGE.—Vertical and inclined staff on right bank opposite city pumping plant; read by Mrs. J. Harris and W. W. Coons.

DISCHARGE MEASUREMENTS.—Made from cable near gage or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifting. Slag dumped into channel below gage causes backwater at gage during low water and scours out at high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.7 feet, October 5 and 12; minimum discharge less than 0.5 second-foot for long periods.

1911–1922: Maximum stage recorded, 14.5 feet about 8 p. m. July 28, 1919 (estimated discharge, 4,050 second-feet). Stream dry or carries less than 0.5 second-foot the greater part of each year.

DIVERSIONS.—Some flood water is diverted above station for irrigation; quantity unknown.

ACCURACY.—Stage-discharge relation not permanent. Not enough discharge measurements were made to define rating. Gage read to half-tenths once a day. Daily discharge not determined. Gage-height record good.

Discharge measurements of Whitewater Draw near Douglas, Ariz., during the year ending September 30, 1922

[Made by J. H. Gardiner]

Date	Gage height	Discharge
	Feet	*Sec.-ft.*
Dec. 6	3.65	0.19
Mar. 12	3.70	.25

Daily gage height, in feet, of Whitewater Draw at Douglas, Ariz., for the period October 1, 1921, to April 30, 1922

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	3.75	3.6	3.65	3.65	3.7	3.65	3.7
2	3.75	3.6	3.7	3.7	3.65	3.7	3.7
3	3.75	3.65	3.65	3.7	3.65	3.7	3.7
4	3.75	3.65	3.65	3.65	3.65	3.7	3.7
5	4.7	3.65	3.7	3.65	3.65	3.7	3.7
6	4.5	3.65	3.65	3.65	3.65	3.7	3.7
7	4.45	3.65	3.65	3.65	3.65	3.65	3.7
8	4.1	3.7	3.65	3.65	3.65	3.65	3.7
9	3.9	3.65	3.65	3.65	3.7	3.7	3.7
10	3.6	3.7	3.65	3.7	3.7	3.7	3.7
11	3.5	3.65	3.65	3.7	3.7	3.7	3.7
12	4.7	3.65	3.65	3.65	3.65	3.7	3.7
13	3.65	3.65	3.7	3.65	3.65	3.65	3.65
14	3.65	3.65	3.7	3.65	3.65	3.65	3.7
15	3.65	3.6	3.65	3.65	3.65	3.7	3.65
16	3.6	3.65	3.65	3.65	3.65	3.7	3.7
17	3.6	3.6	3.65	3.65	3.65	3.7	3.7
18	3.6	3.6	3.7	3.7	3.65	3.7	3.7
19	3.6	3.6	3.7	3.65	3.65	3.7	3.7
20	3.65	3.6	3.65	3.65	3.65	3.65	3.7
21	3.6	3.6	3.65	3.65	3.65	3.7	3.7
22	3.6	3.65	3.65	3.65	3.65	3.7	3.7
23	3.6	3.65	3.7	3.65	3.65	3.7	3.7
24	3.6	3.65	3.7	3.65	3.65	3.7	3.65
25	3.6	3.65	3.7	3.65	3.65	3.7	3.65
26	3.6	3.6	3.65	3.65	3.65	3.7	3.6
27	3.6	3.6	3.65	3.7	3.65	3.7	3.6
28	3.6	3.6	3.6	3.7	3.65	3.7	3.6
29	3.6	3.7	3.6	3.65	-------	3.7	3.6
30	3.65	3.7	3.6	3.65	-------	3.7	3.7
31	3.6	-------	3.6	3.7	-------	3.7	-------

MISCELLANEOUS DISCHARGE MEASUREMENTS

In addition to the records of stream flow obtained at gaging stations and reported in the preceding pages, measurements of flow were made at a number of other points, as shown by the following table:

Miscellaneous discharge measurements in Colorado River drainage basin during the year ending September 30, 1922

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
May 24	Brush Creek	Eagle River	At mouth, near Eagle, Colo.		179
24	Gypsum Creek	do	At mouth, at Gypsum, Colo.		24
Oct. 16	Kannah Creek	Gunnison River	In sec. 34, T. 125, R. 97 W., near Whitewater, Colo.	0.78	31.9
Jan. 23	Ashley Creek	Green River	In sec. 1, T. 3 S., R. 20 E., immediately above Ashley Spring and 12 miles northwest of Vernal, Uinta County, Utah.		10.7
Sept. 5	Ashley Spring	Ashley Creek	In sec. 1, T. 3 S., R. 20 E., at its confluence with Ashley Creek, Utah.		50
Jan. 24	Vernal Milling & Light Co.'s tailrace.	do	In sec. 18, T. 3 S., R. 21 E., at power plant of Vernal Milling & Light Co., 10 miles northwest of Vernal, Uinta County, Utah.		36.4
12	Hades Canyon Creek	North Fork of Duchesne River.	In SE. ¼ sec. 26, T. 2 N., R. 9 W., at mouth, 10 miles northwest of Hanna, Duchesne County, Utah.		2.5
Oct. 14	Currant Creek	Strawberry River	In sec. 22, T. 3 S., R. 9 W., one-half mile below Deep Creek near Fruitland, Utah.	2.37	48
Jan. 15	do	do	do	2.28	40.3
June 22	do	do	do	3.88	200
Sept. 8	do	do	do	3.06	53.3
Dec. 5	Fish Creek	Price River	In SW. ¼ sec. 26, T. 11 S., R. 8 E., 1 mile south of Colton, Utah.		24.8
Jan. 29	do	do	do		23.1
Mar. 15	do	do	do		25.2
Dec. 5	Price River	Green River	In NW. ¼ sec. 26, T. 11 S., R. 8 E., half a mile southeast of Colton, Utah		45.2
5	White River	do	In NW. ¼ sec. 26, T. 11 S., R. 8 E., quarter of a mile below Colton, Utah.		8.8
7	Huntington Creek	San Rafael River	In sec. 33, T. 18 S., R. 9 E., at former gaging station "Huntington Creek near Castledale, Utah," 6 miles east of Castledale.	3.28	14.2
Jan. 28	do	do	do	5.33	37
Nov. 3	Virgin River	Colorado River	In sec. 4, T. 41 S., R. 7 W., at upper bridge at Orderville, Kane County, Utah		20
May 25	do	do	In sec. 1, T. 17 S., R. 68 E., at bridge on Arrowhead Trail, 2½ miles northeast of St. Thomas, Nev.		2,160
Nov. 5	Hunts Spring	Santa Clara Creek	In sec. 11, T. 39 S., R. 16 W., enters Santa Clara Creek 40 feet below gaging station "Santa Clara Creek near Central, Utah.		2.8
May 25	Mesquite Canal	Virgin River	In sec. 3, T. 39 N., R. 16 W., near head of canal near Mesquite, Nev.		32.3
25	Bunkerville Canal	do	In sec. 29, T. 39 N., R. 16 W., at head of canal half a mile south of Mesquite, Nev.	4.94	21.5

Miscellaneous discharge measurements in Colorado River drainage basin during the year ending September 30, 1922—Continued

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
July 4	Muddy River	Virgin River	In SE. ¼ sec. 15, T. 14 S., R. 65 E., at former gaging station "Muddy River near Moapa, Nev."	1.16	42.3
5	do	do	In NE. ¼ sec. 2, T. 15 S., R. 66 E., at former gaging station "Muddy River at Weiser ranch, near Moapa, Nev."		20
3	do	do	In sec. 13, T. 17 S., R. 68 E., at former gaging station, "Muddy River near St. Thomas, Nev."		3
Apr. 24	Gila River	Colorado River	Head of Duncan Valley, Ariz.		48
July 18	do	do	do		26
Sept. 9	do	do	do		49
Apr. 26	do	do	Below Duncan Valley at Sheldon, Ariz.		1
July 19	do	do	Below Duncan Valley at York, Ariz.		10
Apr. 24	Sunset Canal	Gila River	Near Duncan, Ariz		36
24	Cosper-Wilson Canal	do	do		12.4
July 18	do	do	do		1.5
Sept. 9	do	do	do		4.8
Apr. 24	Cosper-Windham Canal.	do	do		13
25	Moddle Canal	do	do		1.8
25	Shriver ditch	do	do		2.6
July 17	do	do	do		1.2
Apr. 24	Valley Canal	do	do		7.7
25	Duncan Canal	do	do		1.8
25	Black-McClesky Canal.	do	do		6.7
25	Colmonero Canal	do	do		8.3
26	York Canal	do	At York, Ariz		6.2
26	York Cattle Co.'s ditch	do	do		3.4
July 28	San Carlos River	do	At San Carlos, Ariz		40
Apr. 13	Dripping Springs Creek.	do	At mouth, above Winkleman, Ariz.		.9
Dec. 3	San Pedro River	do	At Hereford, Ariz	5.80	7.4
July 31	do	do	do	7.10	491
Aug. 1	do	do	do	6.10	37.5
5	do	do	do	5.85	10.8
Apr. 11	Pusch ditch	San Pedro River	Near Feldman, Ariz		2.6
Feb. 22	Ditch No. 1	Santa Cruz River	At highway bridge, 7 miles northeast of Nogales, Ariz.		1.1
Apr. 23	Sabino Creek	Rillito Creek	Near mouth, near Tucson, Ariz.		7.1
23	do	do	do		7.3

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